

ANNEX 1

DRIVE CYCLES AND SHIFTING PROCEDURES

1. General requirements

1.1 The cycle to be driven is dependent on the test vehicle's rated power (in W) to kerb mass (in kg) ratio, and v_{\max} .

Kommentar [SMD1]: in definitions?

1.1.1. Vehicles are classified into three power to kerb mass ratio classes.

1.1.2. Kerb mass is the unladen mass as defined in B.3. Definitions.

1.1.3. v_{\max} is the maximum speed of the vehicle as declared by the manufacturer (ECE R 68) and not that which may be artificially restricted.

2. Vehicle classifications

2.1. Class 1 vehicles have a power to kerb mass ratio of ≤ 22 W/kg.

2.2. Class 2 vehicles have a power to kerb mass ratio of > 22 but ≤ 34 W/kg.

2.2. Class 3 vehicles have a power to kerb mass ratio of > 34 W/kg.

3. Test Cycles

3.1. The test cycle for Class 1 vehicles consists of two parts.

3.1.1. WLTC cycle 1, part 1 (low speed) lasts 589 seconds and has a maximum speed of 49.1 km/h. See Figure 1 and Table 1.

3.1.2. WLTC cycle 1, part 2 (medium speed) lasts 432 seconds (590 to 1022 seconds) and has a maximum speed of 64.4 km/h. See Figure 2 and Table 2.

3.1.3. If the vehicle's $v_{\max} \geq 70$ km/h, part 1 is repeated immediately after part 2.

3.1.4. If the vehicle's $v_{\max} < 70$ km/h, part 1 is driven 3 times without an interruption and part 2 is not driven.

3.2. The test cycle for Class 2 vehicles consists of three parts.

3.1.1. WLTC cycle 2, part 1 (low speed) lasts 589 seconds and has a maximum speed of 51.4 km/h. See Figure 3 and Table 3.

3.1.2. WLTC cycle 2, part 2 (medium speed) lasts 432 seconds (590 to 1022 seconds) and has a maximum speed of 74.7 km/h. See Figure 4 and Table 4.

3.1.3. WLTC cycle 2, part 3 (high speed) lasts 454 seconds (1023 to 1477 seconds) and has a maximum speed of 85,2 km/h. See Figure 5 and Table 5.

3.1.3. If the vehicle's $v_{\max} \geq 90$ km/h, all three parts must be driven.

3.1.4. If the vehicle's $v_{\max} < 90$ km/h, part 3 is replaced by a part 1 cycle without an interruption.

3.3. The test cycle for Class 3 vehicles consists of four parts.

- 3.3.1. WLTC cycle 3, part 1 (low speed) lasts 589 seconds and has a maximum speed of 56.5 km/h. See Figure 6 and Table 6.
- 3.3.2. WLTC cycle 3, part 2 (medium speed) lasts 432 seconds (590 to 1022 seconds) and has a maximum speed of 76.6 km/h. See Figure 7 and Table 7.
- 3.3.3. WLTC cycle 3, part 3 (high speed) lasts 454 seconds (1023 to 1477 seconds) and has a maximum speed of 97.4 km/h. See Figure 8 and Table 8.
- 3.3.4. WLTC cycle 3, part 4 (extra high speed) lasts 322 seconds (1478 to 1800 seconds) and has a maximum speed of 131.3 km/h. See Figure 9 and Table 9.
- 3.3.5. If the vehicle's $v_{\max} \geq 135$ km/h, all four parts must be driven.
- 3.3.6. If the vehicle's $v_{\max} < 135$ km/h, part 4 is replaced by a part 1 cycle without an interruption.

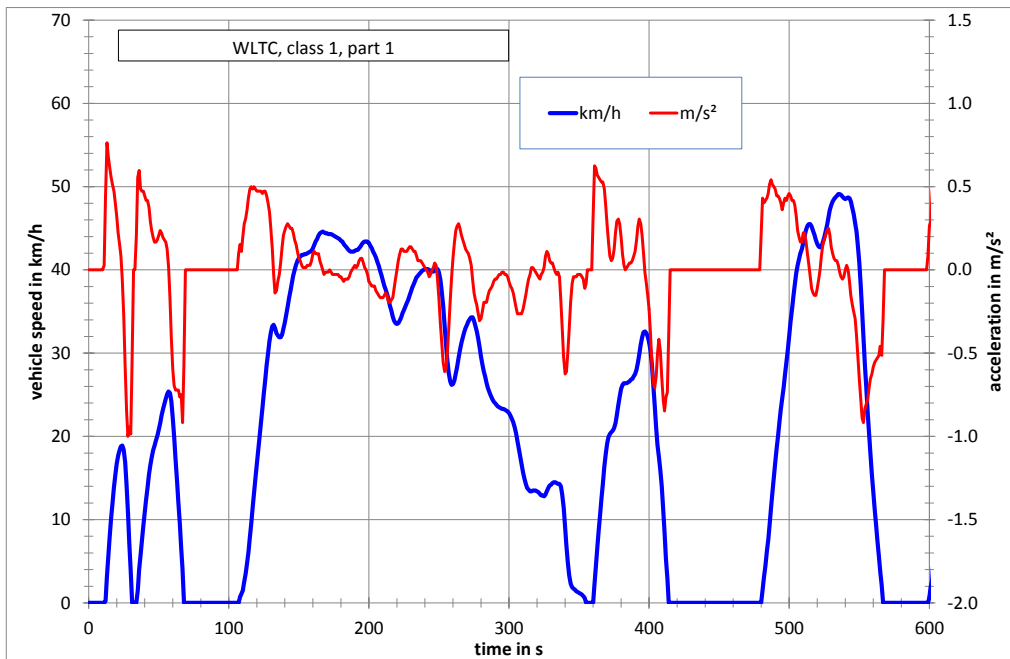


Figure 1: WLTC class 1 part 1

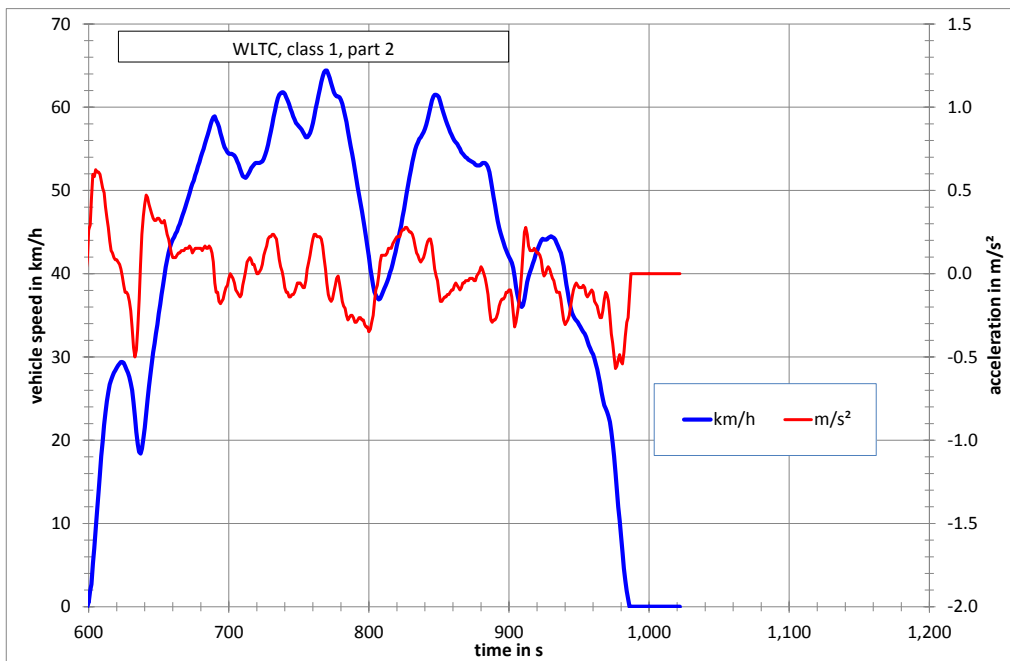


Figure 2: WLTC class 1 part 2

Table 1: WLTC class 1 part 1

Part	Time	WLTC class 1, part 1, vehicle speed	Time	WLTC class 1, part 1, vehicle speed	Time	WLTC class 1, part 1, vehicle speed
	s	km/h	s	km/h	s	km/h
1	181	43.4	241	40.1	301	22.5
1	182	43.1	242	40.1	302	22.1
1	183	42.9	243	40.0	303	21.7
1	184	42.7	244	39.8	304	21.1
1	185	42.5	245	39.8	305	20.4
1	186	42.3	246	39.8	306	19.5
1	187	42.2	247	39.9	307	18.5
1	188	42.2	248	40.1	308	17.6
1	189	42.2	249	40.1	309	16.6
1	190	42.3	250	39.7	310	15.7
1	191	42.4	251	38.8	311	14.9
1	192	42.4	252	37.4	312	14.3
1	193	42.6	253	35.6	313	13.8
1	194	42.8	254	33.4	314	13.6
1	195	43.1	255	31.2	315	13.4
1	196	43.3	256	29.1	316	13.4
1	197	43.4	257	27.6	317	13.5
1	198	43.4	258	26.6	318	13.5
1	199	43.4	259	26.2	319	13.5
1	200	43.2	260	26.3	320	13.4
1	201	42.9	261	26.7	321	13.3
1	202	42.6	262	27.5	322	13.1
1	203	42.2	263	28.4	323	12.9
1	204	41.9	264	29.4	324	12.9
1	205	41.5	265	30.4	325	12.8
1	206	41.0	266	31.2	326	13.0
1	207	40.5	267	31.9	327	13.4
1	208	39.9	268	32.5	328	13.8
1	209	39.3	269	33.0	329	14.1
1	210	38.7	270	33.4	330	14.2
1	211	38.1	271	33.8	331	14.4
1	212	37.6	272	34.1	332	14.5
1	213	37.1	273	34.3	333	14.5
1	214	36.5	274	34.3	334	14.4
1	215	35.7	275	33.9	335	14.3
1	216	35.1	276	33.3	336	14.3
1	217	34.4	277	32.6	337	14.0
1	218	33.9	278	31.8	338	13.0
1	219	33.6	279	30.7	339	11.4
1	220	33.5	280	29.6	340	9.2
1	221	33.6	281	28.6	341	6.9
1	222	33.9	282	27.8	342	4.8
1	223	34.3	283	27.2	343	3.3
1	224	34.8	284	26.4	344	2.3
1	225	35.2	285	25.8	345	1.9
1	226	35.6	286	25.3	346	1.7
1	227	36.0	287	24.9	347	1.6
1	228	36.4	288	24.5	348	1.4
1	229	36.9	289	24.2	349	1.3
1	230	37.4	290	24.0	350	1.2
1	231	37.9	291	23.8	351	1.1
1	232	38.3	292	23.6	352	1.0
1	233	38.7	293	23.5	353	0.8
1	234	39.1	294	23.4	354	0.6
1	235	39.3	295	23.3	355	0.0
1	236	39.5	296	23.3	356	0.0
1	237	39.7	297	23.2	357	0.0
1	238	39.9	298	23.1	358	0.0
1	239	40.0	299	23.0	359	0.0
1	240	40.1	300	22.8	360	0.0

Table 1 (continued)

Part	Time	WLTC class 1, part 1, vehicle speed	Time	WLTC class 1, part 1, vehicle speed	Time	WLTC class 1, part 1, vehicle speed
	s	km/h		s		km/h
1	361	2.2	421	0.0	481	1.6
1	362	4.5	422	0.0	482	3.1
1	363	6.6	423	0.0	483	4.5
1	364	8.6	424	0.0	484	6.1
1	365	10.6	425	0.0	485	7.6
1	366	12.5	426	0.0	486	9.4
1	367	14.4	427	0.0	487	11.3
1	368	16.3	428	0.0	488	13.3
1	369	17.9	429	0.0	489	15.0
1	370	19.1	430	0.0	490	16.9
1	371	19.9	431	0.0	491	18.5
1	372	20.3	432	0.0	492	20.1
1	373	20.5	433	0.0	493	21.7
1	374	20.7	434	0.0	494	23.2
1	375	21.0	435	0.0	495	24.6
1	376	21.6	436	0.0	496	25.8
1	377	22.6	437	0.0	497	27.5
1	378	23.7	438	0.0	498	28.9
1	379	24.8	439	0.0	499	30.5
1	380	25.7	440	0.0	500	32.1
1	381	26.2	441	0.0	501	33.8
1	382	26.4	442	0.0	502	35.3
1	383	26.4	443	0.0	503	36.8
1	384	26.4	444	0.0	504	38.3
1	385	26.5	445	0.0	505	39.6
1	386	26.6	446	0.0	506	40.6
1	387	26.8	447	0.0	507	41.3
1	388	26.9	448	0.0	508	42.0
1	389	27.2	449	0.0	509	42.5
1	390	27.5	450	0.0	510	43.2
1	391	28.0	451	0.0	511	44.1
1	392	28.8	452	0.0	512	44.8
1	393	29.9	453	0.0	513	45.3
1	394	31.0	454	0.0	514	45.5
1	395	31.9	455	0.0	515	45.5
1	396	32.5	456	0.0	516	45.2
1	397	32.6	457	0.0	517	44.7
1	398	32.4	458	0.0	518	44.2
1	399	32.0	459	0.0	519	43.6
1	400	31.3	460	0.0	520	43.1
1	401	30.3	461	0.0	521	42.8
1	402	28.5	462	0.0	522	42.7
1	403	26.2	463	0.0	523	42.8
1	404	23.6	464	0.0	524	43.3
1	405	21.1	465	0.0	525	43.9
1	406	19.0	466	0.0	526	44.6
1	407	17.5	467	0.0	527	45.4
1	408	16.0	468	0.0	528	46.3
1	409	14.0	469	0.0	529	47.2
1	410	11.4	470	0.0	530	47.8
1	411	8.4	471	0.0	531	48.2
1	412	5.3	472	0.0	532	48.5
1	413	2.9	473	0.0	533	48.7
1	414	0.0	474	0.0	534	48.9
1	415	0.0	475	0.0	535	49.1
1	416	0.0	476	0.0	536	49.1
1	417	0.0	477	0.0	537	49.0
1	418	0.0	478	0.0	538	48.8
1	419	0.0	479	0.0	539	48.6
1	420	0.0	480	0.0	540	48.5

Table 1 (continued)

Part	Time	WLTC class 1, part 1, vehicle speed	Time	WLTC class 1, part 1, vehicle speed	Time	WLTC class 1, part 1, vehicle speed
	s	km/h	s	km/h	s	km/h
1	541	48.6				
1	542	48.7				
1	543	48.6				
1	544	48.2				
1	545	47.5				
1	546	46.7				
1	547	45.7				
1	548	44.6				
1	549	42.9				
1	550	40.8				
1	551	38.2				
1	552	35.3				
1	553	31.8				
1	554	28.7				
1	555	25.8				
1	556	22.9				
1	557	20.2				
1	558	17.8				
1	559	15.5				
1	560	13.3				
1	561	11.3				
1	562	9.3				
1	563	7.4				
1	564	5.5				
1	565	3.7				
1	566	2.2				
1	567	0.0				
1	568	0.0				
1	569	0.0				
1	570	0.0				
1	571	0.0				
1	572	0.0				
1	573	0.0				
1	574	0.0				
1	575	0.0				
1	576	0.0				
1	577	0.0				
1	578	0.0				
1	579	0.0				
1	580	0.0				
1	581	0.0				
1	582	0.0				
1	583	0.0				
1	584	0.0				
1	585	0.0				
1	586	0.0				
1	587	0.0				
1	588	0.0				
1	589	0.0				

Table 2: WLTC class 1 part 2

Part	Time	WLTC class 1, part 2, vehicle speed	Time	WLTC class 1, part 2, vehicle speed	Time	WLTC class 1, part 2, vehicle speed
	s	km/h	s	km/h	s	km/h
2	590	0.0	650	35.2	710	51.7
2	591	0.0	651	36.3	711	51.6
2	592	0.0	652	37.5	712	51.5
2	593	0.0	653	38.5	713	51.7
2	594	0.0	654	39.7	714	52.0
2	595	0.0	655	40.8	715	52.3
2	596	0.0	656	41.7	716	52.7
2	597	0.0	657	42.5	717	52.9
2	598	0.0	658	43.2	718	53.1
2	599	0.0	659	43.7	719	53.3
2	600	0.6	660	44.1	720	53.3
2	601	1.9	661	44.4	721	53.3
2	602	2.7	662	44.8	722	53.3
2	603	5.2	663	45.1	723	53.4
2	604	7.0	664	45.6	724	53.5
2	605	9.4	665	46.0	725	53.8
2	606	11.5	666	46.5	726	54.3
2	607	13.8	667	47.0	727	54.8
2	608	15.9	668	47.5	728	55.5
2	609	18.1	669	48.0	729	56.3
2	610	19.9	670	48.6	730	57.1
2	611	21.8	671	49.1	731	57.9
2	612	23.4	672	49.7	732	58.8
2	613	24.7	673	50.3	733	59.6
2	614	25.8	674	50.8	734	60.4
2	615	26.7	675	51.2	735	61.1
2	616	27.2	676	51.8	736	61.5
2	617	27.7	677	52.3	737	61.7
2	618	28.1	678	52.9	738	61.8
2	619	28.4	679	53.4	739	61.8
2	620	28.7	680	54.0	740	61.6
2	621	29.0	681	54.5	741	61.2
2	622	29.2	682	55.0	742	60.8
2	623	29.4	683	55.6	743	60.4
2	624	29.4	684	56.2	744	59.8
2	625	29.3	685	56.7	745	59.4
2	626	28.9	686	57.3	746	58.9
2	627	28.5	687	57.9	747	58.5
2	628	28.1	688	58.4	748	58.1
2	629	27.6	689	58.8	749	57.9
2	630	26.9	690	58.9	750	57.7
2	631	26.0	691	58.4	751	57.5
2	632	24.6	692	58.1	752	57.3
2	633	22.8	693	57.6	753	57.0
2	634	21.0	694	56.9	754	56.7
2	635	19.5	695	56.3	755	56.4
2	636	18.6	696	55.7	756	56.4
2	637	18.4	697	55.2	757	56.6
2	638	19.0	698	54.9	758	56.9
2	639	20.1	699	54.6	759	57.4
2	640	21.5	700	54.4	760	58.1
2	641	23.1	701	54.4	761	58.9
2	642	24.9	702	54.4	762	59.8
2	643	26.4	703	54.3	763	60.6
2	644	27.9	704	54.2	764	61.4
2	645	29.2	705	53.9	765	62.2
2	646	30.5	706	53.5	766	63.0
2	647	31.6	707	53.1	767	63.7
2	648	32.8	708	52.6	768	64.2
2	649	33.9	709	52.1	769	64.4

Table 2 (continued)

Part	Time	WLTC class 1, part 2, vehicle speed	Time	WLTC class 1, part 2, vehicle speed	Time	WLTC class 1, part 2, vehicle speed
	s	km/h	s	km/h	s	km/h
2	770	64.4	830	52.5	890	48.2
2	771	64.0	831	53.4	891	47.2
2	772	63.5	832	54.2	892	46.3
2	773	62.9	833	54.9	893	45.5
2	774	62.3	834	55.4	894	44.9
2	775	61.8	835	55.8	895	44.3
2	776	61.5	836	56.2	896	43.8
2	777	61.3	837	56.4	897	43.2
2	778	61.3	838	56.7	898	42.8
2	779	61.2	839	57.0	899	42.4
2	780	60.9	840	57.4	900	42.0
2	781	60.4	841	57.9	901	41.7
2	782	59.7	842	58.6	902	41.3
2	783	59.0	843	59.3	903	40.7
2	784	58.2	844	60.1	904	39.6
2	785	57.2	845	60.8	905	38.4
2	786	56.2	846	61.3	906	37.5
2	787	55.3	847	61.5	907	36.7
2	788	54.4	848	61.5	908	36.2
2	789	53.5	849	61.4	909	36.0
2	790	52.5	850	61.2	910	36.2
2	791	51.4	851	60.6	911	37.0
2	792	50.4	852	60.0	912	38.0
2	793	49.4	853	59.4	913	39.0
2	794	48.5	854	58.9	914	39.7
2	795	47.5	855	58.4	915	40.2
2	796	46.5	856	57.9	916	40.7
2	797	45.5	857	57.5	917	41.2
2	798	44.3	858	57.0	918	41.7
2	799	43.2	859	56.7	919	42.3
2	800	42.0	860	56.3	920	42.7
2	801	40.7	861	56.0	921	43.2
2	802	39.6	862	55.8	922	43.6
2	803	38.6	863	55.6	923	44.0
2	804	37.8	864	55.3	924	44.2
2	805	37.4	865	55.0	925	44.1
2	806	37.1	866	54.6	926	44.1
2	807	36.9	867	54.4	927	44.1
2	808	37.0	868	54.2	928	44.3
2	809	37.4	869	54.0	929	44.4
2	810	37.8	870	53.9	930	44.5
2	811	38.2	871	53.7	931	44.4
2	812	38.6	872	53.6	932	44.3
2	813	39.0	873	53.5	933	44.1
2	814	39.5	874	53.4	934	43.7
2	815	40.1	875	53.3	935	43.3
2	816	40.6	876	53.1	936	42.9
2	817	41.2	877	53.0	937	42.5
2	818	41.9	878	53.0	938	41.8
2	819	42.6	879	53.0	939	40.9
2	820	43.4	880	53.1	940	39.8
2	821	44.2	881	53.3	941	38.7
2	822	45.0	882	53.3	942	37.7
2	823	45.8	883	53.3	943	36.7
2	824	46.8	884	53.1	944	35.9
2	825	47.7	885	52.8	945	35.3
2	826	48.7	886	52.2	946	34.9
2	827	49.7	887	51.3	947	34.6
2	828	50.7	888	50.2	948	34.4
2	829	51.6	889	49.2	949	34.2

Table 2 (continued)

Part	Time	WLTC class 1, part 2, vehicle speed	Time	WLTC class 1, part 2, vehicle speed	Time	WLTC class 1, part 2, vehicle speed
	s	km/h	s	km/h	s	km/h
2	950	33.9	1010	0.0		
2	951	33.6	1011	0.0		
2	952	33.3	1012	0.0		
2	953	33.0	1013	0.0		
2	954	32.8	1014	0.0		
2	955	32.4	1015	0.0		
2	956	31.9	1016	0.0		
2	957	31.4	1017	0.0		
2	958	31.0	1018	0.0		
2	959	30.6	1019	0.0		
2	960	30.3	1020	0.0		
2	961	29.8	1021	0.0		
2	962	29.1	1022	0.0		
2	963	28.5				
2	964	27.7				
2	965	26.8				
2	966	25.8				
2	967	24.9				
2	968	24.2				
2	969	23.8				
2	970	23.4				
2	971	22.9				
2	972	22.2				
2	973	21.1				
2	974	19.6				
2	975	18.1				
2	976	16.0				
2	977	14.0				
2	978	12.0				
2	979	10.3				
2	980	8.5				
2	981	6.5				
2	982	4.6				
2	983	3.1				
2	984	1.9				
2	985	1.0				
2	986	0.0				
2	987	0.0				
2	988	0.0				
2	989	0.0				
2	990	0.0				
2	991	0.0				
2	992	0.0				
2	993	0.0				
2	994	0.0				
2	995	0.0				
2	996	0.0				
2	997	0.0				
2	998	0.0				
2	999	0.0				
2	1000	0.0				
2	1001	0.0				
2	1002	0.0				
2	1003	0.0				
2	1004	0.0				
2	1005	0.0				
2	1006	0.0				
2	1007	0.0				
2	1008	0.0				
2	1009	0.0				

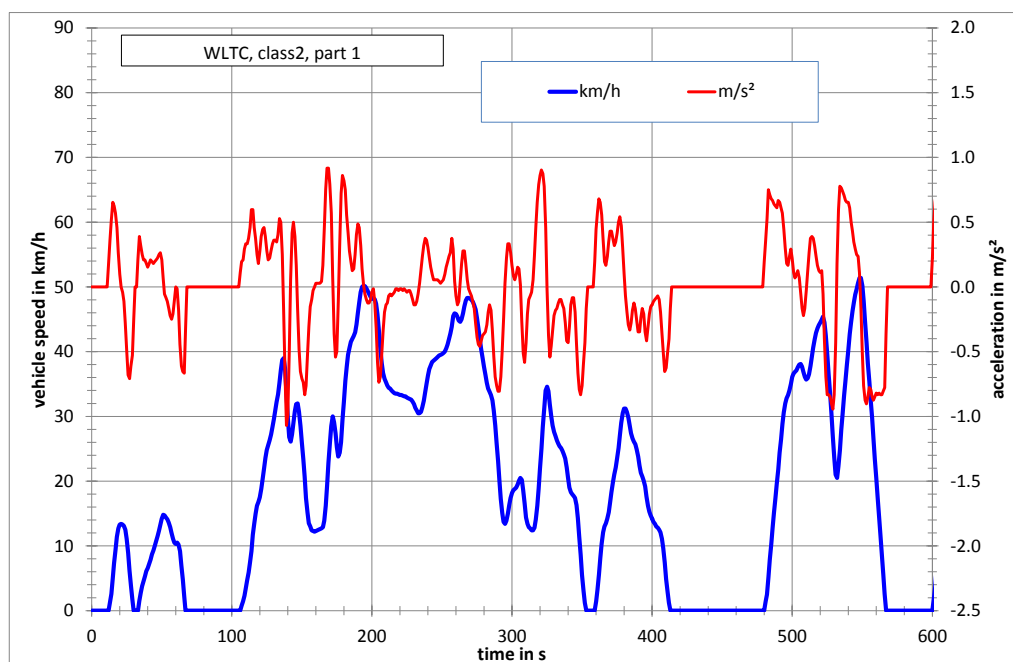


Figure 3: WLTC class 2 part 1

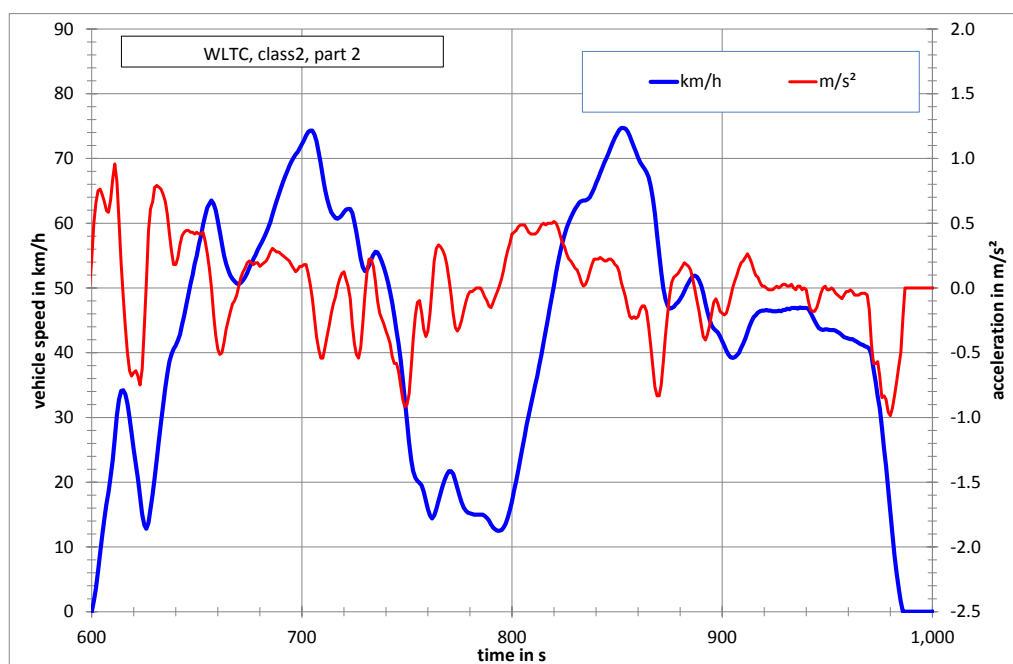


Figure 4: WLTC class 2 part 2

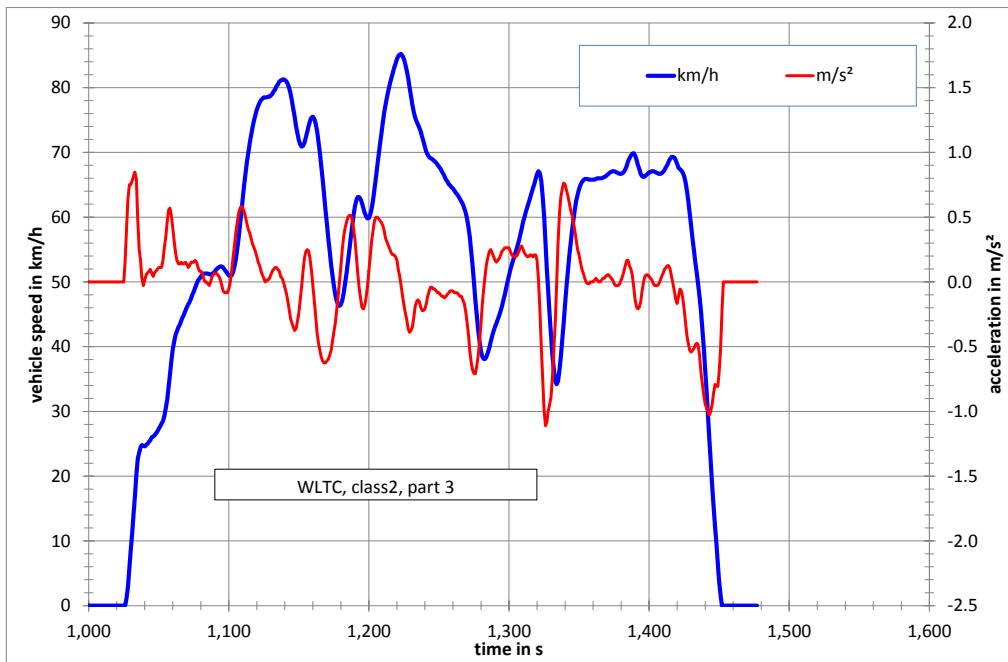


Figure 5: WLTC class 2 part 3

Table 3: WLTC class 2 part 1

Part	Time	WLTC class 2, part 1, vehicle speed		Time	WLTC class 2, part 1, vehicle speed		Time	WLTC class 2, part 1, vehicle speed	
	s	km/h		s	km/h		s	km/h	
1	0	0.0							
1	1	0.0		61	10.5		121	18.8	
1	2	0.0		62	10.2		122	20.3	
1	3	0.0		63	9.2		123	22.0	
1	4	0.0		64	7.0		124	23.6	
1	5	0.0		65	4.8		125	24.8	
1	6	0.0		66	2.3		126	25.6	
1	7	0.0		67	0.0		127	26.3	
1	8	0.0		68	0.0		128	27.2	
1	9	0.0		69	0.0		129	28.3	
1	10	0.0		70	0.0		130	29.6	
1	11	0.0		71	0.0		131	30.9	
1	12	0.0		72	0.0		132	32.2	
1	13	1.2		73	0.0		133	33.4	
1	14	2.6		74	0.0		134	35.1	
1	15	4.9		75	0.0		135	37.2	
1	16	7.3		76	0.0		136	38.7	
1	17	9.4		77	0.0		137	39.0	
1	18	11.4		78	0.0		138	37.4	
1	19	12.7		79	0.0		139	33.9	
1	20	13.3		80	0.0		140	29.7	
1	21	13.4		81	0.0		141	26.8	
1	22	13.3		82	0.0		142	26.1	
1	23	13.1		83	0.0		143	27.2	
1	24	12.5		84	0.0		144	29.1	
1	25	11.1		85	0.0		145	30.8	
1	26	8.9		86	0.0		146	31.9	
1	27	6.2		87	0.0		147	32.0	
1	28	3.8		88	0.0		148	30.7	
1	29	1.8		89	0.0		149	28.5	
1	30	0.0		90	0.0		150	26.0	
1	31	0.0		91	0.0		151	23.4	
1	32	0.0		92	0.0		152	20.7	
1	33	0.0		93	0.0		153	17.4	
1	34	1.5		94	0.0		154	15.2	
1	35	2.8		95	0.0		155	13.5	
1	36	3.8		96	0.0		156	13.0	
1	37	4.6		97	0.0		157	12.4	
1	38	5.3		98	0.0		158	12.3	
1	39	6.1		99	0.0		159	12.2	
1	40	6.6		100	0.0		160	12.3	
1	41	7.2		101	0.0		161	12.4	
1	42	7.9		102	0.0		162	12.5	
1	43	8.7		103	0.0		163	12.6	
1	44	9.3		104	0.0		164	12.7	
1	45	10.0		105	0.0		165	12.9	
1	46	10.7		106	0.0		166	13.9	
1	47	11.5		107	0.8		167	16.2	
1	48	12.3		108	1.4		168	19.3	
1	49	13.3		109	2.3		169	22.8	
1	50	14.2		110	3.5		170	25.9	
1	51	14.8		111	4.7		171	28.5	
1	52	14.7		112	5.9		172	30.0	
1	53	14.4		113	7.4		173	29.1	
1	54	14.1		114	9.2		174	27.4	
1	55	13.6		115	11.7		175	25.2	
1	56	12.9		116	13.5		176	23.8	
1	57	12.0		117	15.0		177	24.4	
1	58	11.1		118	16.2		178	26.0	
1	59	10.5		119	16.8		179	29.6	
1	60	10.3		120	17.5		180	32.2	

Table 3 (continued)

Part	Time	WLTC class 2, part 1, vehicle speed	Time	WLTC class 2, part 1, vehicle speed	Time	WLTC class 2, part 1, vehicle speed
	s	km/h		s		km/h
1	181	35.5	241	37.3	301	18.6
1	182	37.6	242	37.9	302	18.8
1	183	39.5	243	38.4	303	19.0
1	184	40.6	244	38.6	304	19.5
1	185	41.5	245	38.8	305	20.1
1	186	42.0	246	39.0	306	20.5
1	187	42.4	247	39.2	307	20.2
1	188	43.0	248	39.4	308	18.6
1	189	44.2	249	39.5	309	16.5
1	190	45.9	250	39.6	310	14.4
1	191	47.7	251	39.8	311	13.4
1	192	49.2	252	40.0	312	12.9
1	193	50.0	253	40.5	313	12.7
1	194	50.2	254	41.1	314	12.4
1	195	50.1	255	41.9	315	12.4
1	196	49.8	256	42.8	316	12.8
1	197	49.4	257	43.8	317	14.1
1	198	48.9	258	45.5	318	16.2
1	199	48.5	259	45.9	319	18.8
1	200	48.2	260	45.8	320	21.9
1	201	48.2	261	45.4	321	25.0
1	202	48.1	262	44.8	322	28.4
1	203	47.4	263	44.6	323	31.3
1	204	45.8	264	45.0	324	34.0
1	205	43.2	265	45.9	325	34.6
1	206	40.5	266	47.0	326	33.9
1	207	38.2	267	47.9	327	31.9
1	208	36.7	268	48.3	328	30.0
1	209	35.8	269	48.3	329	28.6
1	210	35.3	270	48.2	330	27.6
1	211	34.8	271	48.0	331	27.0
1	212	34.4	272	47.7	332	26.3
1	213	34.3	273	47.2	333	25.8
1	214	34.0	274	46.5	334	25.4
1	215	33.8	275	45.2	335	25.1
1	216	33.6	276	43.7	336	24.7
1	217	33.5	277	42.0	337	24.1
1	218	33.5	278	40.4	338	23.5
1	219	33.4	279	39.0	339	22.1
1	220	33.3	280	37.7	340	20.5
1	221	33.3	281	36.4	341	19.0
1	222	33.2	282	35.2	342	18.3
1	223	33.1	283	34.3	343	18.0
1	224	33.1	284	33.8	344	17.7
1	225	32.9	285	33.3	345	17.4
1	226	32.8	286	32.5	346	16.3
1	227	32.7	287	30.9	347	14.3
1	228	32.6	288	28.6	348	11.5
1	229	32.3	289	25.9	349	8.6
1	230	31.9	290	23.1	350	5.5
1	231	31.3	291	20.1	351	3.1
1	232	30.9	292	17.3	352	1.2
1	233	30.5	293	15.1	353	0.0
1	234	30.5	294	13.7	354	0.0
1	235	30.7	295	13.4	355	0.0
1	236	31.4	296	13.9	356	0.0
1	237	32.4	297	15.0	357	0.0
1	238	33.7	298	16.3	358	0.0
1	239	35.1	299	17.4	359	0.0
1	240	36.3	300	18.2	360	1.4

Table 3 (continued)

Part	Time	WLTC class 2, part 1, vehicle speed	Time	WLTC class 2, part 1, vehicle speed	Time	WLTC class 2, part 1, vehicle speed
	s	km/h		km/h		s
1	361	3.2	421	0.0	481	1.4
1	362	5.6	422	0.0	482	2.5
1	363	8.1	423	0.0	483	5.2
1	364	10.3	424	0.0	484	7.9
1	365	12.1	425	0.0	485	10.3
1	366	13.0	426	0.0	486	12.8
1	367	13.5	427	0.0	487	15.1
1	368	14.2	428	0.0	488	17.4
1	369	15.2	429	0.0	489	19.6
1	370	16.7	430	0.0	490	21.8
1	371	18.3	431	0.0	491	24.4
1	372	19.8	432	0.0	492	26.5
1	373	21.0	433	0.0	493	28.8
1	374	22.1	434	0.0	494	30.6
1	375	23.5	435	0.0	495	32.0
1	376	25.1	436	0.0	496	32.8
1	377	27.1	437	0.0	497	33.3
1	378	29.0	438	0.0	498	34.0
1	379	30.5	439	0.0	499	35.0
1	380	31.2	440	0.0	500	36.1
1	381	31.2	441	0.0	501	36.6
1	382	30.7	442	0.0	502	36.9
1	383	29.8	443	0.0	503	37.1
1	384	28.6	444	0.0	504	37.6
1	385	27.4	445	0.0	505	38.0
1	386	26.6	446	0.0	506	38.1
1	387	26.1	447	0.0	507	37.7
1	388	25.7	448	0.0	508	36.9
1	389	24.9	449	0.0	509	36.1
1	390	23.8	450	0.0	510	35.7
1	391	22.4	451	0.0	511	35.9
1	392	21.3	452	0.0	512	36.5
1	393	20.7	453	0.0	513	37.8
1	394	20.1	454	0.0	514	39.2
1	395	19.2	455	0.0	515	40.6
1	396	17.6	456	0.0	516	41.9
1	397	16.2	457	0.0	517	42.9
1	398	15.3	458	0.0	518	43.6
1	399	14.7	459	0.0	519	44.1
1	400	14.2	460	0.0	520	44.5
1	401	13.7	461	0.0	521	44.9
1	402	13.4	462	0.0	522	45.4
1	403	13.0	463	0.0	523	44.5
1	404	12.8	464	0.0	524	42.5
1	405	12.5	465	0.0	525	39.5
1	406	12.1	466	0.0	526	36.5
1	407	11.1	467	0.0	527	33.5
1	408	9.6	468	0.0	528	30.4
1	409	7.4	469	0.0	529	27.0
1	410	4.9	470	0.0	530	23.6
1	411	2.9	471	0.0	531	21.0
1	412	1.2	472	0.0	532	20.5
1	413	0.0	473	0.0	533	22.3
1	414	0.0	474	0.0	534	24.8
1	415	0.0	475	0.0	535	27.9
1	416	0.0	476	0.0	536	30.3
1	417	0.0	477	0.0	537	33.2
1	418	0.0	478	0.0	538	35.4
1	419	0.0	479	0.0	539	38.0
1	420	0.0	480	0.0	540	40.1

Table 3 (continued)

Part	Time	WLTC class 2, part 1, vehicle speed	Time	WLTC class 2, part 1, vehicle speed	Time	WLTC class 2, part 1, vehicle speed
	s	km/h	s	km/h	s	km/h
1	541	42.7				
1	542	44.5				
1	543	46.3				
1	544	47.6				
1	545	48.8				
1	546	49.7				
1	547	50.6				
1	548	51.4				
1	549	51.4				
1	550	50.2				
1	551	47.8				
1	552	44.7				
1	553	41.5				
1	554	38.2				
1	555	35.4				
1	556	32.6				
1	557	29.7				
1	558	26.5				
1	559	23.4				
1	560	20.4				
1	561	17.5				
1	562	14.4				
1	563	11.6				
1	564	8.4				
1	565	5.6				
1	566	2.6				
1	567	0.0				
1	568	0.0				
1	569	0.0				
1	570	0.0				
1	571	0.0				
1	572	0.0				
1	573	0.0				
1	574	0.0				
1	575	0.0				
1	576	0.0				
1	577	0.0				
1	578	0.0				
1	579	0.0				
1	580	0.0				
1	581	0.0				
1	582	0.0				
1	583	0.0				
1	584	0.0				
1	585	0.0				
1	586	0.0				
1	587	0.0				
1	588	0.0				
1	589	0.0				

Table 4: WLTC class 2 part 2

Part	Time	WLTC class 2, part 2, vehicle speed	Time	WLTC class 2, part 2, vehicle speed	Time	WLTC class 2, part 2, vehicle speed
	s	km/h		km/h		s
2	590	0.0	650	55.0	710	67.1
2	591	0.0	651	56.8	711	65.3
2	592	0.0	652	58.0	712	63.8
2	593	0.0	653	59.8	713	62.6
2	594	0.0	654	61.1	714	61.7
2	595	0.0	655	62.4	715	61.2
2	596	0.0	656	63.0	716	60.8
2	597	0.0	657	63.5	717	60.7
2	598	0.0	658	63.0	718	60.9
2	599	0.0	659	62.0	719	61.2
2	600	0.0	660	60.4	720	61.7
2	601	1.6	661	58.6	721	62.1
2	602	3.6	662	56.7	722	62.2
2	603	6.3	663	55.0	723	62.2
2	604	9.0	664	53.7	724	61.6
2	605	11.8	665	52.7	725	60.2
2	606	14.2	666	51.9	726	58.5
2	607	16.6	667	51.4	727	56.5
2	608	18.5	668	51.0	728	54.6
2	609	20.8	669	50.7	729	53.2
2	610	23.4	670	50.6	730	52.6
2	611	26.9	671	50.8	731	52.8
2	612	30.3	672	51.2	732	53.5
2	613	32.8	673	51.7	733	54.4
2	614	34.1	674	52.3	734	55.1
2	615	34.2	675	53.1	735	55.6
2	616	33.6	676	53.8	736	55.5
2	617	32.1	677	54.5	737	54.9
2	618	30.0	678	55.1	738	54.1
2	619	27.5	679	55.9	739	53.2
2	620	25.1	680	56.5	740	52.1
2	621	22.8	681	57.1	741	50.8
2	622	20.5	682	57.8	742	49.4
2	623	17.9	683	58.5	743	47.7
2	624	15.1	684	59.3	744	45.6
2	625	13.4	685	60.2	745	43.5
2	626	12.8	686	61.3	746	41.4
2	627	13.7	687	62.4	747	38.9
2	628	16.0	688	63.4	748	36.0
2	629	18.1	689	64.4	749	32.7
2	630	20.8	690	65.4	750	29.4
2	631	23.7	691	66.3	751	26.2
2	632	26.5	692	67.2	752	23.5
2	633	29.3	693	68.0	753	21.7
2	634	32.0	694	68.8	754	20.7
2	635	34.5	695	69.5	755	20.2
2	636	36.8	696	70.1	756	19.9
2	637	38.6	697	70.6	757	19.5
2	638	39.8	698	71.0	758	18.5
2	639	40.6	699	71.6	759	17.2
2	640	41.1	700	72.2	760	15.8
2	641	41.9	701	72.8	761	14.8
2	642	42.8	702	73.5	762	14.4
2	643	44.3	703	74.1	763	14.9
2	644	45.7	704	74.3	764	15.9
2	645	47.4	705	74.3	765	17.1
2	646	48.9	706	73.7	766	18.3
2	647	50.6	707	72.6	767	19.4
2	648	52.0	708	71.0	768	20.4
2	649	53.7	709	69.2	769	21.2

Table 4 (continued)

Part	Time	WLTC class 2, part 2, vehicle speed	Time	WLTC class 2, part 2, vehicle speed	Time	WLTC class 2, part 2, vehicle speed
	s	km/h	s	km/h	s	km/h
2	770	21.7	830	62.2	890	50.4
2	771	21.7	831	62.7	891	49.2
2	772	21.3	832	63.2	892	47.7
2	773	20.3	833	63.4	893	46.3
2	774	19.1	834	63.5	894	45.1
2	775	17.9	835	63.5	895	44.2
2	776	16.9	836	63.7	896	43.7
2	777	16.1	837	64.0	897	43.4
2	778	15.6	838	64.6	898	43.1
2	779	15.3	839	65.3	899	42.5
2	780	15.2	840	66.2	900	41.8
2	781	15.1	841	66.9	901	41.1
2	782	15.0	842	67.8	902	40.3
2	783	15.0	843	68.6	903	39.7
2	784	15.0	844	69.4	904	39.3
2	785	15.0	845	70.1	905	39.2
2	786	15.0	846	70.9	906	39.3
2	787	14.8	847	71.7	907	39.6
2	788	14.5	848	72.5	908	40.0
2	789	14.1	849	73.2	909	40.7
2	790	13.5	850	73.8	910	41.4
2	791	13.0	851	74.4	911	42.2
2	792	12.7	852	74.7	912	43.1
2	793	12.5	853	74.7	913	44.1
2	794	12.5	854	74.6	914	44.8
2	795	12.6	855	74.2	915	45.5
2	796	13.0	856	73.5	916	45.8
2	797	13.6	857	72.6	917	46.2
2	798	14.6	858	71.8	918	46.4
2	799	15.7	859	71.0	919	46.5
2	800	17.1	860	70.1	920	46.5
2	801	18.7	861	69.4	921	46.6
2	802	20.2	862	68.9	922	46.5
2	803	21.9	863	68.4	923	46.5
2	804	23.6	864	67.9	924	46.4
2	805	25.4	865	67.1	925	46.4
2	806	27.1	866	65.8	926	46.4
2	807	28.9	867	63.9	927	46.5
2	808	30.4	868	61.4	928	46.4
2	809	32.0	869	58.4	929	46.6
2	810	33.4	870	55.4	930	46.6
2	811	35.0	871	52.4	931	46.8
2	812	36.4	872	50.0	932	46.7
2	813	38.1	873	48.3	933	46.9
2	814	39.7	874	47.3	934	46.9
2	815	41.6	875	46.8	935	46.9
2	816	43.3	876	46.9	936	46.8
2	817	45.1	877	47.1	937	47.0
2	818	46.9	878	47.5	938	46.9
2	819	48.7	879	47.8	939	46.9
2	820	50.5	880	48.3	940	46.9
2	821	52.4	881	48.8	941	46.8
2	822	54.1	882	49.5	942	46.2
2	823	55.7	883	50.2	943	45.6
2	824	57.0	884	50.8	944	44.9
2	825	58.2	885	51.4	945	44.3
2	826	59.3	886	51.8	946	43.8
2	827	60.1	887	51.9	947	43.6
2	828	60.9	888	51.7	948	43.5
2	829	61.6	889	51.2	949	43.6

Table 4 (continued)

Part	Time	WLTC class 2, part 2, vehicle speed	Time	WLTC class 2, part 2, vehicle speed	Time	WLTC class 2, part 2, vehicle speed
	s	km/h	s	km/h	s	km/h
2	950	43.6	1010	0.0		
2	951	43.5	1011	0.0		
2	952	43.5	1012	0.0		
2	953	43.5	1013	0.0		
2	954	43.4	1014	0.0		
2	955	43.2	1015	0.0		
2	956	43.0	1016	0.0		
2	957	42.7	1017	0.0		
2	958	42.4	1018	0.0		
2	959	42.3	1019	0.0		
2	960	42.2	1020	0.0		
2	961	42.1	1021	0.0		
2	962	42.1	1022	0.0		
2	963	41.9				
2	964	41.7				
2	965	41.5				
2	966	41.3				
2	967	41.2				
2	968	41.0				
2	969	40.9				
2	970	40.6				
2	971	39.7				
2	972	37.5				
2	973	35.5				
2	974	33.3				
2	975	31.4				
2	976	28.4				
2	977	25.3				
2	978	22.4				
2	979	19.1				
2	980	15.5				
2	981	12.0				
2	982	8.8				
2	983	6.0				
2	984	3.6				
2	985	1.6				
2	986	0.0				
2	987	0.0				
2	988	0.0				
2	989	0.0				
2	990	0.0				
2	991	0.0				
2	992	0.0				
2	993	0.0				
2	994	0.0				
2	995	0.0				
2	996	0.0				
2	997	0.0				
2	998	0.0				
2	999	0.0				
2	1000	0.0				
2	1001	0.0				
2	1002	0.0				
2	1003	0.0				
2	1004	0.0				
2	1005	0.0				
2	1006	0.0				
2	1007	0.0				
2	1008	0.0				
2	1009	0.0				

Table 5: WLTC class 2 part 3

Part	Time	WLTC class 2, part 3, vehicle speed	Time	WLTC class 2, part 3, vehicle speed	Time	WLTC class 2, part 3, vehicle speed
	s	km/h	s	km/h	s	km/h
3	1023	0.0	1083	51.3	1143	80.0
3	1024	0.0	1084	51.3	1144	79.1
3	1025	0.0	1085	51.3	1145	78.0
3	1026	0.0	1086	51.2	1146	76.8
3	1027	1.1	1087	51.1	1147	75.5
3	1028	3.0	1088	51.2	1148	74.1
3	1029	5.7	1089	51.4	1149	72.9
3	1030	8.4	1090	51.6	1150	71.9
3	1031	11.1	1091	51.9	1151	71.2
3	1032	14.0	1092	52.1	1152	70.9
3	1033	17.0	1093	52.3	1153	71.0
3	1034	20.1	1094	52.4	1154	71.5
3	1035	22.7	1095	52.4	1155	72.3
3	1036	23.6	1096	52.2	1156	73.2
3	1037	24.5	1097	51.9	1157	74.1
3	1038	24.8	1098	51.6	1158	74.9
3	1039	24.7	1099	51.3	1159	75.4
3	1040	24.6	1100	51.0	1160	75.5
3	1041	24.8	1101	50.9	1161	75.2
3	1042	25.0	1102	51.0	1162	74.5
3	1043	25.3	1103	51.5	1163	73.3
3	1044	25.6	1104	52.3	1164	71.7
3	1045	26.0	1105	53.5	1165	69.9
3	1046	26.1	1106	55.0	1166	67.9
3	1047	26.3	1107	56.8	1167	65.7
3	1048	26.6	1108	58.8	1168	63.5
3	1049	26.9	1109	60.9	1169	61.2
3	1050	27.3	1110	63.0	1170	59.0
3	1051	27.7	1111	65.0	1171	56.8
3	1052	28.1	1112	66.9	1172	54.7
3	1053	28.5	1113	68.6	1173	52.7
3	1054	29.3	1114	70.1	1174	50.9
3	1055	30.4	1115	71.5	1175	49.4
3	1056	31.8	1116	72.8	1176	48.1
3	1057	33.7	1117	73.9	1177	47.1
3	1058	35.8	1118	74.9	1178	46.5
3	1059	37.8	1119	75.8	1179	46.3
3	1060	39.5	1120	76.6	1180	46.5
3	1061	40.8	1121	77.2	1181	47.2
3	1062	41.8	1122	77.7	1182	48.3
3	1063	42.4	1123	78.1	1183	49.7
3	1064	43.0	1124	78.3	1184	51.3
3	1065	43.4	1125	78.5	1185	53.0
3	1066	44.0	1126	78.5	1186	54.9
3	1067	44.5	1127	78.5	1187	56.7
3	1068	45.0	1128	78.6	1188	58.6
3	1069	45.5	1129	78.6	1189	60.2
3	1070	46.1	1130	78.8	1190	61.6
3	1071	46.5	1131	79.0	1191	62.6
3	1072	46.9	1132	79.4	1192	63.1
3	1073	47.4	1133	79.7	1193	63.1
3	1074	48.0	1134	80.2	1194	62.8
3	1075	48.5	1135	80.5	1195	62.2
3	1076	49.1	1136	80.9	1196	61.4
3	1077	49.7	1137	81.1	1197	60.7
3	1078	50.2	1138	81.2	1198	60.1
3	1079	50.5	1139	81.3	1199	59.8
3	1080	50.8	1140	81.2	1200	59.9
3	1081	51.1	1141	81.0	1201	60.4
3	1082	51.3	1142	80.6	1202	61.4

Table 5 (continued)

Part	Time	WLTC class 2, part 3, vehicle speed	Time	WLTC class 2, part 3, vehicle speed	Time	WLTC class 2, part 3, vehicle speed
	s	km/h		km/h		s
3	1203	62.7	1263	63.5	1323	65.6
3	1204	64.3	1264	63.2	1324	63.3
3	1205	66.1	1265	62.8	1325	60.2
3	1206	67.9	1266	62.4	1326	56.2
3	1207	69.7	1267	62.0	1327	52.2
3	1208	71.4	1268	61.4	1328	48.4
3	1209	73.1	1269	60.8	1329	45.0
3	1210	74.7	1270	59.8	1330	41.6
3	1211	76.2	1271	58.6	1331	38.6
3	1212	77.5	1272	56.9	1332	36.4
3	1213	78.6	1273	54.8	1333	34.8
3	1214	79.7	1274	52.4	1334	34.2
3	1215	80.6	1275	49.9	1335	34.7
3	1216	81.5	1276	47.3	1336	36.3
3	1217	82.2	1277	44.8	1337	38.5
3	1218	83.0	1278	42.6	1338	41.0
3	1219	83.7	1279	40.7	1339	43.7
3	1220	84.4	1280	39.3	1340	46.5
3	1221	84.9	1281	38.4	1341	49.1
3	1222	85.1	1282	38.1	1342	51.6
3	1223	85.2	1283	38.1	1343	53.9
3	1224	84.9	1284	38.5	1344	56.0
3	1225	84.4	1285	39.1	1345	57.9
3	1226	83.6	1286	39.9	1346	59.7
3	1227	82.7	1287	40.8	1347	61.2
3	1228	81.5	1288	41.7	1348	62.5
3	1229	80.1	1289	42.4	1349	63.5
3	1230	78.7	1290	43.1	1350	64.3
3	1231	77.4	1291	43.6	1351	65.0
3	1232	76.2	1292	44.2	1352	65.4
3	1233	75.4	1293	44.8	1353	65.7
3	1234	74.8	1294	45.5	1354	65.9
3	1235	74.3	1295	46.3	1355	65.9
3	1236	73.8	1296	47.2	1356	65.9
3	1237	73.2	1297	48.1	1357	65.8
3	1238	72.4	1298	49.1	1358	65.8
3	1239	71.6	1299	50.0	1359	65.8
3	1240	70.8	1300	51.0	1360	65.8
3	1241	70.1	1301	51.9	1361	65.8
3	1242	69.6	1302	52.7	1362	65.9
3	1243	69.3	1303	53.4	1363	66.0
3	1244	69.1	1304	54.1	1364	66.0
3	1245	69.0	1305	54.8	1365	66.0
3	1246	68.8	1306	55.5	1366	66.0
3	1247	68.6	1307	56.3	1367	66.1
3	1248	68.4	1308	57.2	1368	66.2
3	1249	68.1	1309	58.2	1369	66.3
3	1250	67.8	1310	59.2	1370	66.5
3	1251	67.5	1311	60.0	1371	66.7
3	1252	67.1	1312	60.8	1372	66.9
3	1253	66.7	1313	61.5	1373	67.0
3	1254	66.3	1314	62.2	1374	67.1
3	1255	65.8	1315	62.9	1375	67.1
3	1256	65.5	1316	63.7	1376	67.0
3	1257	65.1	1317	64.4	1377	66.9
3	1258	64.9	1318	65.1	1378	66.8
3	1259	64.6	1319	65.9	1379	66.7
3	1260	64.4	1320	66.6	1380	66.7
3	1261	64.1	1321	67.1	1381	66.8
3	1262	63.8	1322	66.8	1382	67.0

Table 5 (continued)

Part	Time	WLTC class 2, part 3, vehicle speed		Time	WLTC class 2, part 3, vehicle speed	
	s	km/h		s	km/h	
3	1383	67.4	1443	25.8		
3	1384	67.9	1444	22.1		
3	1385	68.6	1445	18.6		
3	1386	69.1	1446	15.3		
3	1387	69.5	1447	12.4		
3	1388	69.8	1448	9.6		
3	1389	69.9	1449	6.6		
3	1390	69.5	1450	3.8		
3	1391	68.9	1451	1.6		
3	1392	68.1	1452	0.0		
3	1393	67.4	1453	0.0		
3	1394	66.7	1454	0.0		
3	1395	66.3	1455	0.0		
3	1396	66.2	1456	0.0		
3	1397	66.3	1457	0.0		
3	1398	66.5	1458	0.0		
3	1399	66.7	1459	0.0		
3	1400	66.9	1460	0.0		
3	1401	67.0	1461	0.0		
3	1402	67.1	1462	0.0		
3	1403	67.1	1463	0.0		
3	1404	67.0	1464	0.0		
3	1405	66.9	1465	0.0		
3	1406	66.8	1466	0.0		
3	1407	66.7	1467	0.0		
3	1408	66.7	1468	0.0		
3	1409	66.8	1469	0.0		
3	1410	67.0	1470	0.0		
3	1411	67.3	1471	0.0		
3	1412	67.7	1472	0.0		
3	1413	68.1	1473	0.0		
3	1414	68.6	1474	0.0		
3	1415	69.0	1475	0.0		
3	1416	69.3	1476	0.0		
3	1417	69.3	1477	0.0		
3	1418	69.2				
3	1419	68.8				
3	1420	68.2				
3	1421	67.6				
3	1422	67.4				
3	1423	67.2				
3	1424	66.9				
3	1425	66.3				
3	1426	65.4				
3	1427	64.0				
3	1428	62.4				
3	1429	60.6				
3	1430	58.6				
3	1431	56.7				
3	1432	54.8				
3	1433	53.0				
3	1434	51.3				
3	1435	49.6				
3	1436	47.8				
3	1437	45.5				
3	1438	42.8				
3	1439	39.8				
3	1440	36.5				
3	1441	33.0				
3	1442	29.5				

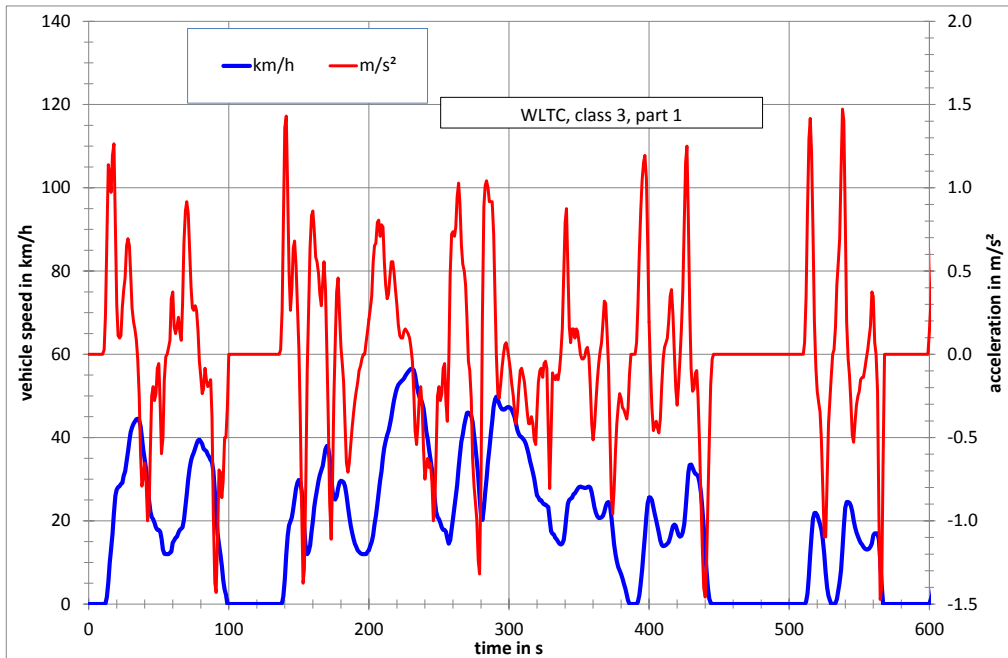


Figure 6: WLTC class 3 part 1

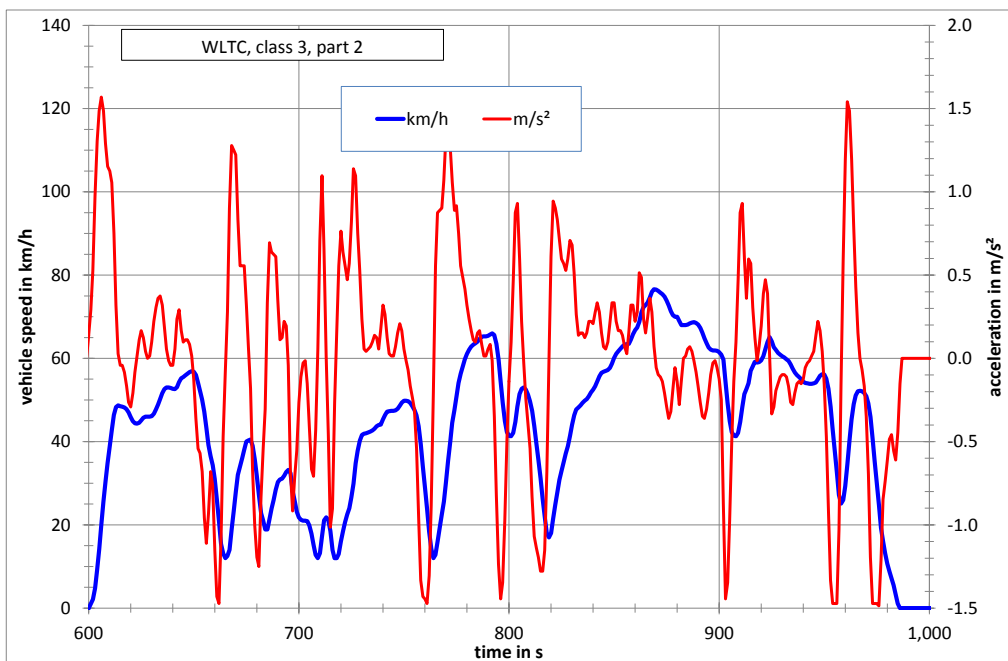


Figure 7: WLTC class 3 part 2

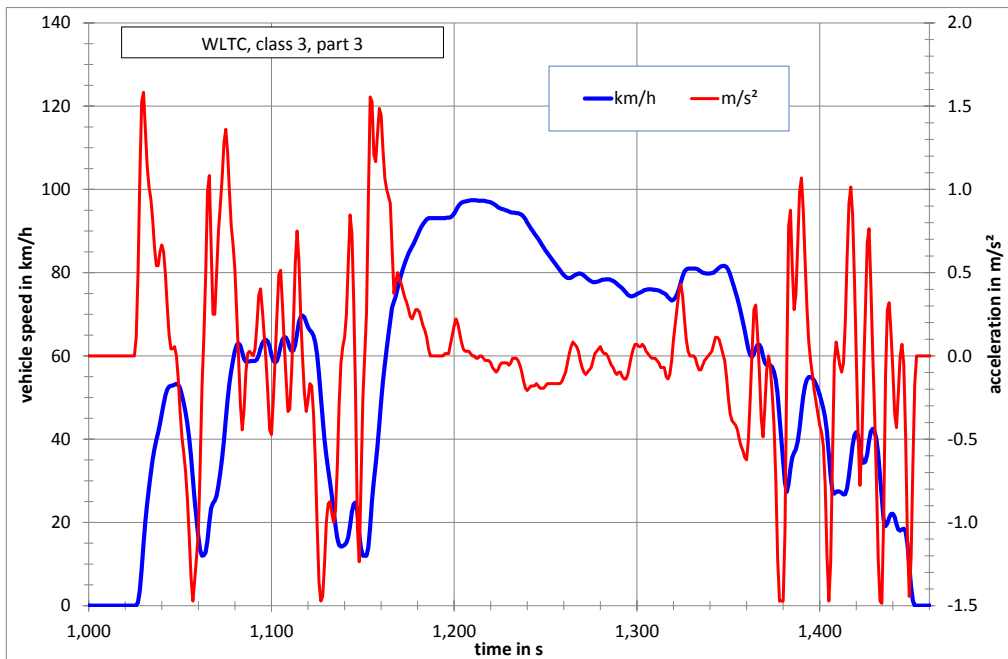


Figure 8: WLTC class 3 part 3

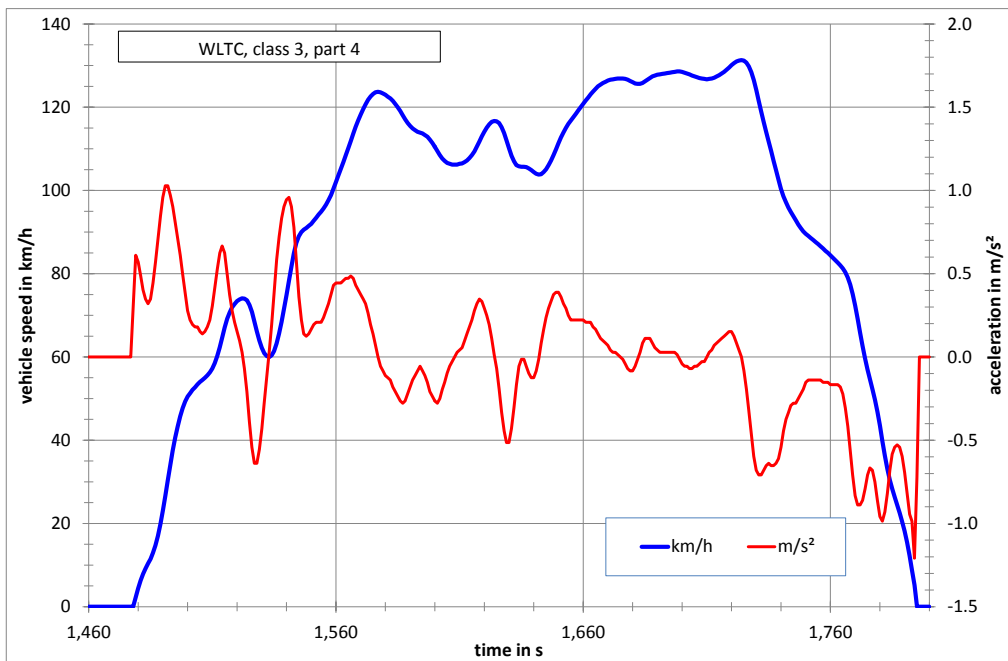


Figure 9: WLTC class 3 part 4

Table 6: WLTC class 3 part 1

Part	Time	WLTC class 3, part 1, vehicle speed	Time	WLTC class 3, part 1, vehicle speed	Time	WLTC class 3, part 1, vehicle speed
	s	km/h	s	km/h	s	km/h
1	0	0.0				
1	1	0.0	61	15.3	121	0.0
1	2	0.0	62	15.9	122	0.0
1	3	0.0	63	16.2	123	0.0
1	4	0.0	64	17.1	124	0.0
1	5	0.0	65	17.8	125	0.0
1	6	0.0	66	18.1	126	0.0
1	7	0.0	67	18.4	127	0.0
1	8	0.0	68	20.3	128	0.0
1	9	0.0	69	23.2	129	0.0
1	10	0.0	70	26.5	130	0.0
1	11	0.0	71	29.8	131	0.0
1	12	0.2	72	32.6	132	0.0
1	13	1.7	73	34.4	133	0.0
1	14	5.4	74	35.5	134	0.0
1	15	9.9	75	36.4	135	0.0
1	16	13.1	76	37.4	136	0.0
1	17	16.9	77	38.5	137	0.0
1	18	21.7	78	39.3	138	0.2
1	19	26.0	79	39.5	139	1.9
1	20	27.5	80	39.0	140	6.1
1	21	28.1	81	38.5	141	11.7
1	22	28.3	82	37.3	142	16.4
1	23	28.8	83	37.0	143	18.9
1	24	29.1	84	36.7	144	19.9
1	25	30.8	85	35.9	145	20.8
1	26	31.9	86	35.3	146	22.8
1	27	34.1	87	34.6	147	25.4
1	28	36.6	88	34.2	148	27.7
1	29	39.1	89	31.9	149	29.2
1	30	41.3	90	27.3	150	29.8
1	31	42.5	91	22.0	151	29.4
1	32	43.3	92	17.0	152	27.2
1	33	43.9	93	14.2	153	22.6
1	34	44.4	94	12.0	154	17.3
1	35	44.5	95	9.1	155	13.3
1	36	44.2	96	5.8	156	12.0
1	37	42.7	97	3.6	157	12.6
1	38	39.9	98	2.2	158	14.1
1	39	37.0	99	0.0	159	17.2
1	40	34.6	100	0.0	160	20.1
1	41	32.3	101	0.0	161	23.4
1	42	29.0	102	0.0	162	25.5
1	43	25.1	103	0.0	163	27.6
1	44	22.2	104	0.0	164	29.5
1	45	20.9	105	0.0	165	31.1
1	46	20.4	106	0.0	166	32.1
1	47	19.5	107	0.0	167	33.2
1	48	18.4	108	0.0	168	35.2
1	49	17.8	109	0.0	169	37.2
1	50	17.8	110	0.0	170	38.0
1	51	17.4	111	0.0	171	37.4
1	52	15.7	112	0.0	172	35.1
1	53	13.1	113	0.0	173	31.0
1	54	12.1	114	0.0	174	27.1
1	55	12.0	115	0.0	175	25.3
1	56	12.0	116	0.0	176	25.1
1	57	12.0	117	0.0	177	25.9
1	58	12.3	118	0.0	178	27.8
1	59	12.6	119	0.0	179	29.2
1	60	14.7	120	0.0	180	29.6

Table 6 (continued)

Part	Time	WLTC class 3, part 1, vehicle speed	Time	WLTC class 3, part 1, vehicle speed	Time	WLTC class 3, part 1, vehicle speed
	s	km/h	s	km/h	s	km/h
1	181	29.5	241	41.5	301	47.1
1	182	29.2	242	39.5	302	46.6
1	183	28.3	243	37.0	303	45.8
1	184	26.1	244	34.6	304	44.8
1	185	23.6	245	32.3	305	43.3
1	186	21.0	246	29.0	306	41.8
1	187	18.9	247	25.1	307	40.8
1	188	17.1	248	22.2	308	40.3
1	189	15.7	249	20.9	309	40.1
1	190	14.5	250	20.4	310	39.7
1	191	13.7	251	19.5	311	39.2
1	192	12.9	252	18.4	312	38.5
1	193	12.5	253	17.8	313	37.4
1	194	12.2	254	17.8	314	36.0
1	195	12.0	255	17.4	315	34.4
1	196	12.0	256	15.7	316	33.0
1	197	12.0	257	14.5	317	31.7
1	198	12.0	258	15.4	318	30.0
1	199	12.5	259	17.9	319	28.0
1	200	13.0	260	20.6	320	26.1
1	201	14.0	261	23.2	321	25.6
1	202	15.0	262	25.7	322	24.9
1	203	16.5	263	28.7	323	24.9
1	204	19.0	264	32.5	324	24.3
1	205	21.2	265	36.1	325	23.9
1	206	23.8	266	39.0	326	23.9
1	207	26.9	267	40.8	327	23.6
1	208	29.6	268	42.9	328	23.3
1	209	32.0	269	44.4	329	20.5
1	210	35.2	270	45.9	330	17.5
1	211	37.5	271	46.0	331	16.9
1	212	39.2	272	45.6	332	16.7
1	213	40.5	273	45.3	333	15.9
1	214	41.6	274	43.7	334	15.6
1	215	43.1	275	40.8	335	15.0
1	216	45.0	276	38.0	336	14.5
1	217	47.1	277	34.4	337	14.3
1	218	49.0	278	30.9	338	14.5
1	219	50.6	279	25.5	339	15.4
1	220	51.8	280	21.4	340	17.8
1	221	52.7	281	20.2	341	21.1
1	222	53.1	282	22.9	342	24.1
1	223	53.5	283	26.6	343	25.0
1	224	53.8	284	30.2	344	25.3
1	225	54.2	285	34.1	345	25.5
1	226	54.8	286	37.4	346	26.4
1	227	55.3	287	40.7	347	26.6
1	228	55.8	288	44.0	348	27.1
1	229	56.2	289	47.3	349	27.7
1	230	56.5	290	49.2	350	28.1
1	231	56.5	291	49.8	351	28.2
1	232	56.2	292	49.2	352	28.1
1	233	54.9	293	48.1	353	28.0
1	234	52.9	294	47.3	354	27.9
1	235	51.0	295	46.8	355	27.9
1	236	49.8	296	46.7	356	28.1
1	237	49.2	297	46.8	357	28.2
1	238	48.4	298	47.1	358	28.0
1	239	46.9	299	47.3	359	26.9
1	240	44.3	300	47.3	360	25.0

Table 6 (continued)

Part	Time	WLTC class 3, part 1, vehicle speed	Time	WLTC class 3, part 1, vehicle speed	Time	WLTC class 3, part 1, vehicle speed
	s	km/h		km/h		s
1	361	23.2	421	16.6	481	0.0
1	362	21.9	422	16.2	482	0.0
1	363	21.1	423	16.4	483	0.0
1	364	20.7	424	17.2	484	0.0
1	365	20.7	425	19.1	485	0.0
1	366	20.8	426	22.6	486	0.0
1	367	21.2	427	27.4	487	0.0
1	368	22.1	428	31.6	488	0.0
1	369	23.5	429	33.4	489	0.0
1	370	24.3	430	33.5	490	0.0
1	371	24.5	431	32.8	491	0.0
1	372	23.8	432	31.9	492	0.0
1	373	21.3	433	31.3	493	0.0
1	374	17.7	434	31.1	494	0.0
1	375	14.4	435	30.6	495	0.0
1	376	11.9	436	29.2	496	0.0
1	377	10.2	437	26.7	497	0.0
1	378	8.9	438	23.0	498	0.0
1	379	8.0	439	18.2	499	0.0
1	380	7.2	440	12.9	500	0.0
1	381	6.1	441	7.7	501	0.0
1	382	4.9	442	3.8	502	0.0
1	383	3.7	443	1.3	503	0.0
1	384	2.3	444	0.2	504	0.0
1	385	0.9	445	0.0	505	0.0
1	386	0.0	446	0.0	506	0.0
1	387	0.0	447	0.0	507	0.0
1	388	0.0	448	0.0	508	0.0
1	389	0.0	449	0.0	509	0.0
1	390	0.0	450	0.0	510	0.0
1	391	0.0	451	0.0	511	0.0
1	392	0.5	452	0.0	512	0.5
1	393	2.1	453	0.0	513	2.5
1	394	4.8	454	0.0	514	6.6
1	395	8.3	455	0.0	515	11.8
1	396	12.3	456	0.0	516	16.8
1	397	16.6	457	0.0	517	20.5
1	398	20.9	458	0.0	518	21.9
1	399	24.2	459	0.0	519	21.9
1	400	25.6	460	0.0	520	21.3
1	401	25.6	461	0.0	521	20.3
1	402	24.9	462	0.0	522	19.2
1	403	23.3	463	0.0	523	17.8
1	404	21.6	464	0.0	524	15.5
1	405	20.2	465	0.0	525	11.9
1	406	18.7	466	0.0	526	7.6
1	407	17.0	467	0.0	527	4.0
1	408	15.3	468	0.0	528	2.0
1	409	14.2	469	0.0	529	1.0
1	410	13.9	470	0.0	530	0.0
1	411	14.0	471	0.0	531	0.0
1	412	14.2	472	0.0	532	0.0
1	413	14.5	473	0.0	533	0.2
1	414	14.9	474	0.0	534	1.2
1	415	15.9	475	0.0	535	3.2
1	416	17.4	476	0.0	536	5.2
1	417	18.7	477	0.0	537	8.2
1	418	19.1	478	0.0	538	13.0
1	419	18.8	479	0.0	539	18.8
1	420	17.6	480	0.0	540	23.1

Table 6 (continued)

Part	Time	WLTC class 3, part 1, vehicle speed	Time	WLTC class 3, part 1, vehicle speed	Time	WLTC class 3, part 1, vehicle speed
	s	km/h	s	km/h	s	km/h
1	541	24.5				
1	542	24.5				
1	543	24.3				
1	544	23.6				
1	545	22.3				
1	546	20.1				
1	547	18.5				
1	548	17.2				
1	549	16.3				
1	550	15.4				
1	551	14.7				
1	552	14.3				
1	553	13.7				
1	554	13.3				
1	555	13.1				
1	556	13.1				
1	557	13.3				
1	558	13.8				
1	559	14.5				
1	560	16.5				
1	561	17.0				
1	562	17.0				
1	563	17.0				
1	564	15.4				
1	565	10.1				
1	566	4.8				
1	567	0.0				
1	568	0.0				
1	569	0.0				
1	570	0.0				
1	571	0.0				
1	572	0.0				
1	573	0.0				
1	574	0.0				
1	575	0.0				
1	576	0.0				
1	577	0.0				
1	578	0.0				
1	579	0.0				
1	580	0.0				
1	581	0.0				
1	582	0.0				
1	583	0.0				
1	584	0.0				
1	585	0.0				
1	586	0.0				
1	587	0.0				
1	588	0.0				
1	589	0.0				

Table 7: WLTC class 3 part 2

Part	Time	WLTC class 3, part 2, vehicle speed	Time	WLTC class 3, part 2, vehicle speed	Time	WLTC class 3, part 2, vehicle speed
	s	km/h	s	km/h	s	km/h
2	590	0.0	650	56.8	710	13.2
2	591	0.0	651	56.0	711	17.1
2	592	0.0	652	54.2	712	21.1
2	593	0.0	653	52.1	713	21.8
2	594	0.0	654	50.1	714	21.2
2	595	0.0	655	47.2	715	18.5
2	596	0.0	656	43.2	716	13.9
2	597	0.0	657	39.2	717	12.0
2	598	0.0	658	36.5	718	12.0
2	599	0.0	659	34.3	719	13.0
2	600	0.0	660	31.0	720	16.0
2	601	1.0	661	26.0	721	18.5
2	602	2.1	662	20.7	722	20.6
2	603	4.8	663	15.4	723	22.5
2	604	9.1	664	13.1	724	24.0
2	605	14.2	665	12.0	725	26.6
2	606	19.8	666	12.5	726	29.9
2	607	25.5	667	14.0	727	34.8
2	608	30.5	668	19.0	728	37.8
2	609	34.8	669	23.2	729	40.2
2	610	38.8	670	28.0	730	41.6
2	611	42.9	671	32.0	731	41.9
2	612	46.4	672	34.0	732	42.0
2	613	48.3	673	36.0	733	42.2
2	614	48.7	674	38.0	734	42.4
2	615	48.5	675	40.0	735	42.7
2	616	48.4	676	40.3	736	43.1
2	617	48.2	677	40.5	737	43.7
2	618	47.8	678	39.0	738	44.0
2	619	47.0	679	35.7	739	44.1
2	620	45.9	680	31.8	740	45.3
2	621	44.9	681	27.1	741	46.4
2	622	44.4	682	22.8	742	47.2
2	623	44.3	683	21.1	743	47.3
2	624	44.5	684	18.9	744	47.4
2	625	45.1	685	18.9	745	47.4
2	626	45.7	686	21.3	746	47.5
2	627	46.0	687	23.9	747	47.9
2	628	46.0	688	25.9	748	48.6
2	629	46.0	689	28.4	749	49.4
2	630	46.1	690	30.3	750	49.8
2	631	46.7	691	30.9	751	49.8
2	632	47.7	692	31.1	752	49.7
2	633	48.9	693	31.8	753	49.3
2	634	50.3	694	32.7	754	48.5
2	635	51.6	695	33.2	755	47.6
2	636	52.6	696	32.4	756	46.3
2	637	53.0	697	28.3	757	43.7
2	638	53.0	698	25.8	758	39.3
2	639	52.9	699	23.1	759	34.1
2	640	52.7	700	21.8	760	29.0
2	641	52.6	701	21.2	761	23.7
2	642	53.1	702	21.0	762	18.4
2	643	54.3	703	21.0	763	14.3
2	644	55.2	704	20.9	764	12.0
2	645	55.5	705	19.9	765	12.8
2	646	55.9	706	17.9	766	16.0
2	647	56.3	707	15.1	767	19.1
2	648	56.7	708	12.8	768	22.4
2	649	56.9	709	12.0	769	25.6

Table 7 (continued)

Part	Time	WLTC class 3, part 2, vehicle speed	Time	WLTC class 3, part 2, vehicle speed	Time	WLTC class 3, part 2, vehicle speed
	s	km/h		km/h		s
2	770	30.1	830	44.0	890	68.1
2	771	35.3	831	46.3	891	67.3
2	772	39.9	832	47.7	892	66.2
2	773	44.5	833	48.2	893	64.8
2	774	47.5	834	48.7	894	63.6
2	775	50.9	835	49.3	895	62.6
2	776	54.1	836	49.8	896	62.1
2	777	56.3	837	50.2	897	61.9
2	778	58.1	838	50.9	898	61.9
2	779	59.8	839	51.8	899	61.8
2	780	61.1	840	52.5	900	61.5
2	781	62.1	841	53.3	901	60.9
2	782	62.8	842	54.5	902	59.7
2	783	63.3	843	55.7	903	54.6
2	784	63.6	844	56.5	904	49.3
2	785	64.0	845	56.8	905	44.9
2	786	64.7	846	57.0	906	42.3
2	787	65.2	847	57.2	907	41.4
2	788	65.3	848	57.7	908	41.3
2	789	65.3	849	58.7	909	42.1
2	790	65.4	850	60.1	910	44.7
2	791	65.7	851	61.1	911	48.4
2	792	66.0	852	61.7	912	51.4
2	793	65.6	853	62.3	913	52.7
2	794	63.5	854	62.9	914	54.0
2	795	59.7	855	63.3	915	57.0
2	796	54.6	856	63.4	916	58.1
2	797	49.3	857	63.5	917	59.2
2	798	44.9	858	64.5	918	59.0
2	799	42.3	859	65.8	919	59.1
2	800	41.4	860	66.8	920	59.5
2	801	41.3	861	67.4	921	60.5
2	802	42.1	862	68.8	922	62.3
2	803	44.7	863	71.1	923	63.9
2	804	48.4	864	72.3	924	65.1
2	805	51.4	865	72.8	925	64.1
2	806	52.7	866	73.4	926	62.7
2	807	53.0	867	74.6	927	62.0
2	808	52.5	868	76.0	928	61.3
2	809	51.3	869	76.6	929	60.9
2	810	49.7	870	76.5	930	60.5
2	811	47.4	871	76.2	931	60.2
2	812	43.7	872	75.8	932	59.8
2	813	39.7	873	75.4	933	59.4
2	814	35.5	874	74.8	934	58.6
2	815	31.1	875	73.9	935	57.5
2	816	26.3	876	72.7	936	56.6
2	817	21.9	877	71.3	937	56.0
2	818	18.0	878	70.4	938	55.5
2	819	17.0	879	70.0	939	55.0
2	820	18.0	880	70.0	940	54.4
2	821	21.4	881	69.0	941	54.1
2	822	24.8	882	68.0	942	54.0
2	823	27.9	883	68.0	943	53.9
2	824	30.8	884	68.0	944	53.9
2	825	33.0	885	68.1	945	54.0
2	826	35.1	886	68.4	946	54.2
2	827	37.1	887	68.6	947	55.0
2	828	38.9	888	68.7	948	55.8
2	829	41.4	889	68.5	949	56.2

Table 7 (continued)

Part	Time	WLTC class 3, part 2, vehicle speed	Time	WLTC class 3, part 2, vehicle speed	Time	WLTC class 3, part 2, vehicle speed
	s	km/h	s	km/h	s	km/h
2	950	56.1	1010	0.0		
2	951	55.1	1011	0.0		
2	952	52.7	1012	0.0		
2	953	48.4	1013	0.0		
2	954	43.1	1014	0.0		
2	955	37.8	1015	0.0		
2	956	32.5	1016	0.0		
2	957	27.2	1017	0.0		
2	958	25.1	1018	0.0		
2	959	26.0	1019	0.0		
2	960	29.3	1020	0.0		
2	961	34.6	1021	0.0		
2	962	40.4	1022	0.0		
2	963	45.3				
2	964	49.0				
2	965	51.1				
2	966	52.1				
2	967	52.2				
2	968	52.1				
2	969	51.7				
2	970	50.9				
2	971	49.2				
2	972	45.9				
2	973	40.6				
2	974	35.3				
2	975	30.0				
2	976	24.7				
2	977	19.3				
2	978	16.0				
2	979	13.2				
2	980	10.7				
2	981	8.8				
2	982	7.2				
2	983	5.5				
2	984	3.2				
2	985	1.1				
2	986	0.0				
2	987	0.0				
2	988	0.0				
2	989	0.0				
2	990	0.0				
2	991	0.0				
2	992	0.0				
2	993	0.0				
2	994	0.0				
2	995	0.0				
2	996	0.0				
2	997	0.0				
2	998	0.0				
2	999	0.0				
2	1000	0.0				
2	1001	0.0				
2	1002	0.0				
2	1003	0.0				
2	1004	0.0				
2	1005	0.0				
2	1006	0.0				
2	1007	0.0				
2	1008	0.0				
2	1009	0.0				

Table 8: WLTC class 3 part 3

Part	Time	WLTC class 3, part 3, vehicle speed	Time	WLTC class 3, part 3, vehicle speed	Time	WLTC class 3, part 3, vehicle speed
	s	km/h	s	km/h	s	km/h
3	1023	0.0	1083	62.5	1143	19.1
3	1024	0.0	1084	60.9	1144	22.5
3	1025	0.0	1085	59.3	1145	24.4
3	1026	0.0	1086	58.6	1146	24.8
3	1027	0.8	1087	58.6	1147	22.7
3	1028	3.6	1088	58.7	1148	17.4
3	1029	8.6	1089	58.8	1149	13.8
3	1030	14.6	1090	58.8	1150	12.0
3	1031	20.0	1091	58.8	1151	12.0
3	1032	24.4	1092	59.1	1152	12.0
3	1033	28.2	1093	60.1	1153	13.9
3	1034	31.7	1094	61.7	1154	18.8
3	1035	35.0	1095	63.0	1155	25.1
3	1036	37.6	1096	63.7	1156	29.8
3	1037	39.7	1097	63.9	1157	33.8
3	1038	41.5	1098	63.5	1158	38.2
3	1039	43.6	1099	62.3	1159	43.4
3	1040	46.0	1100	60.3	1160	48.9
3	1041	48.4	1101	58.9	1161	53.8
3	1042	50.5	1102	58.4	1162	57.8
3	1043	51.9	1103	58.8	1163	61.5
3	1044	52.6	1104	60.2	1164	65.0
3	1045	52.8	1105	62.3	1165	68.4
3	1046	52.9	1106	63.9	1166	71.6
3	1047	53.1	1107	64.5	1167	73.0
3	1048	53.3	1108	64.4	1168	74.3
3	1049	53.1	1109	63.5	1169	76.2
3	1050	52.3	1110	62.0	1170	77.9
3	1051	50.7	1111	61.2	1171	79.5
3	1052	48.8	1112	61.3	1172	81.0
3	1053	46.5	1113	62.6	1173	82.3
3	1054	43.8	1114	65.3	1174	83.5
3	1055	40.3	1115	68.0	1175	84.6
3	1056	36.0	1116	69.4	1176	85.5
3	1057	30.7	1117	69.7	1177	86.3
3	1058	25.4	1118	69.3	1178	87.1
3	1059	21.0	1119	68.1	1179	88.1
3	1060	16.7	1120	66.9	1180	89.1
3	1061	13.4	1121	66.2	1181	90.1
3	1062	12.0	1122	65.7	1182	91.0
3	1063	12.1	1123	64.9	1183	91.7
3	1064	12.8	1124	63.2	1184	92.3
3	1065	15.6	1125	60.3	1185	92.8
3	1066	19.9	1126	55.8	1186	93.1
3	1067	23.4	1127	50.5	1187	93.1
3	1068	24.6	1128	45.2	1188	93.1
3	1069	25.2	1129	40.1	1189	93.1
3	1070	26.4	1130	36.2	1190	93.1
3	1071	28.8	1131	32.9	1191	93.1
3	1072	31.8	1132	29.8	1192	93.1
3	1073	35.3	1133	26.6	1193	93.1
3	1074	39.5	1134	23.0	1194	93.1
3	1075	44.5	1135	19.4	1195	93.1
3	1076	49.3	1136	16.3	1196	93.2
3	1077	53.3	1137	14.6	1197	93.2
3	1078	56.4	1138	14.2	1198	93.3
3	1079	58.9	1139	14.3	1199	93.7
3	1080	61.2	1140	14.6	1200	94.2
3	1081	62.6	1141	15.1	1201	95.0
3	1082	63.0	1142	16.4	1202	95.8

Table 8 (continued)

Part	Time	WLTC class 3, part 3, vehicle speed	Time	WLTC class 3, part 3, vehicle speed	Time	WLTC class 3, part 3, vehicle speed
	s	km/h	s	km/h	s	km/h
3	1203	96.4	1263	78.7	1323	76.1
3	1204	96.8	1264	78.8	1324	77.7
3	1205	97.0	1265	79.1	1325	79.2
3	1206	97.1	1266	79.4	1326	80.3
3	1207	97.2	1267	79.6	1327	80.8
3	1208	97.3	1268	79.8	1328	81.0
3	1209	97.4	1269	79.8	1329	81.0
3	1210	97.4	1270	79.6	1330	81.0
3	1211	97.4	1271	79.3	1331	81.0
3	1212	97.4	1272	78.9	1332	81.0
3	1213	97.3	1273	78.5	1333	80.9
3	1214	97.3	1274	78.2	1334	80.6
3	1215	97.3	1275	77.9	1335	80.3
3	1216	97.3	1276	77.7	1336	80.0
3	1217	97.2	1277	77.7	1337	79.9
3	1218	97.1	1278	77.8	1338	79.8
3	1219	97.0	1279	77.9	1339	79.8
3	1220	96.9	1280	78.1	1340	79.8
3	1221	96.7	1281	78.3	1341	79.9
3	1222	96.4	1282	78.3	1342	80.0
3	1223	96.1	1283	78.4	1343	80.4
3	1224	95.7	1284	78.4	1344	80.8
3	1225	95.5	1285	78.4	1345	81.2
3	1226	95.3	1286	78.2	1346	81.5
3	1227	95.2	1287	78.0	1347	81.6
3	1228	95.0	1288	77.7	1348	81.6
3	1229	94.9	1289	77.3	1349	81.4
3	1230	94.7	1290	76.9	1350	80.7
3	1231	94.5	1291	76.6	1351	79.6
3	1232	94.4	1292	76.2	1352	78.2
3	1233	94.4	1293	75.7	1353	76.8
3	1234	94.3	1294	75.2	1354	75.3
3	1235	94.3	1295	74.7	1355	73.8
3	1236	94.1	1296	74.4	1356	72.1
3	1237	93.9	1297	74.3	1357	70.2
3	1238	93.4	1298	74.4	1358	68.2
3	1239	92.8	1299	74.6	1359	66.1
3	1240	92.0	1300	74.9	1360	63.8
3	1241	91.3	1301	75.1	1361	61.6
3	1242	90.6	1302	75.3	1362	60.2
3	1243	90.0	1303	75.5	1363	59.8
3	1244	89.3	1304	75.8	1364	60.4
3	1245	88.7	1305	75.9	1365	61.8
3	1246	88.1	1306	76.0	1366	62.6
3	1247	87.4	1307	76.0	1367	62.7
3	1248	86.7	1308	76.0	1368	61.9
3	1249	86.0	1309	75.9	1369	60.0
3	1250	85.3	1310	75.9	1370	58.4
3	1251	84.7	1311	75.8	1371	57.8
3	1252	84.1	1312	75.7	1372	57.8
3	1253	83.5	1313	75.5	1373	57.8
3	1254	82.9	1314	75.2	1374	57.3
3	1255	82.3	1315	75.0	1375	56.2
3	1256	81.7	1316	74.7	1376	54.3
3	1257	81.1	1317	74.1	1377	50.8
3	1258	80.5	1318	73.7	1378	45.5
3	1259	79.9	1319	73.3	1379	40.2
3	1260	79.4	1320	73.5	1380	34.9
3	1261	79.0	1321	74.0	1381	29.6
3	1262	78.7	1322	74.9	1382	27.3

Table 8 (continued)

Part	Time	WLTC class 3, part 3, vehicle speed	Time	WLTC class 3, part 3, vehicle speed	Time	WLTC class 3, part 3, vehicle speed
	s	km/h		s		km/h
3	1383	29.3	1443	18.3		
3	1384	32.9	1444	18.0		
3	1385	35.6	1445	18.3		
3	1386	36.7	1446	18.5		
3	1387	37.6	1447	17.9		
3	1388	39.4	1448	15.0		
3	1389	42.5	1449	9.9		
3	1390	46.5	1450	4.6		
3	1391	50.2	1451	1.2		
3	1392	52.8	1452	0.0		
3	1393	54.3	1453	0.0		
3	1394	54.9	1454	0.0		
3	1395	54.9	1455	0.0		
3	1396	54.7	1456	0.0		
3	1397	54.1	1457	0.0		
3	1398	53.2	1458	0.0		
3	1399	52.1	1459	0.0		
3	1400	50.7	1460	0.0		
3	1401	49.1	1461	0.0		
3	1402	47.4	1462	0.0		
3	1403	45.2	1463	0.0		
3	1404	41.8	1464	0.0		
3	1405	36.5	1465	0.0		
3	1406	31.2	1466	0.0		
3	1407	27.6	1467	0.0		
3	1408	26.9	1468	0.0		
3	1409	27.3	1469	0.0		
3	1410	27.5	1470	0.0		
3	1411	27.4	1471	0.0		
3	1412	27.1	1472	0.0		
3	1413	26.7	1473	0.0		
3	1414	26.8	1474	0.0		
3	1415	28.2	1475	0.0		
3	1416	31.1	1476	0.0		
3	1417	34.8	1477	0.0		
3	1418	38.4				
3	1419	40.9				
3	1420	41.7				
3	1421	40.9				
3	1422	38.3				
3	1423	35.3				
3	1424	34.3				
3	1425	34.6				
3	1426	36.3				
3	1427	39.5				
3	1428	41.8				
3	1429	42.5				
3	1430	41.9				
3	1431	40.1				
3	1432	36.6				
3	1433	31.3				
3	1434	26.0				
3	1435	20.6				
3	1436	19.1				
3	1437	19.7				
3	1438	21.1				
3	1439	22.0				
3	1440	22.1				
3	1441	21.4				
3	1442	19.6				

Table 9: WLTC class 3 part 4

Part	Time	WLTC class 3, part 4, vehicle speed	Time	WLTC class 3, part 4, vehicle speed	Time	WLTC class 3, part 4, vehicle speed
	s	km/h		km/h		s
4	1478	0.0	1538	68.4	1598	112.2
4	1479	2.2	1539	71.6	1599	111.4
4	1480	4.4	1540	74.9	1600	110.5
4	1481	6.3	1541	78.4	1601	109.5
4	1482	7.9	1542	81.8	1602	108.5
4	1483	9.2	1543	84.9	1603	107.7
4	1484	10.4	1544	87.4	1604	107.1
4	1485	11.5	1545	89.0	1605	106.6
4	1486	12.9	1546	90.0	1606	106.4
4	1487	14.7	1547	90.6	1607	106.2
4	1488	17.0	1548	91.0	1608	106.2
4	1489	19.8	1549	91.5	1609	106.2
4	1490	23.1	1550	92.0	1610	106.4
4	1491	26.7	1551	92.7	1611	106.5
4	1492	30.5	1552	93.4	1612	106.8
4	1493	34.1	1553	94.2	1613	107.2
4	1494	37.5	1554	94.9	1614	107.8
4	1495	40.6	1555	95.7	1615	108.5
4	1496	43.3	1556	96.6	1616	109.4
4	1497	45.7	1557	97.7	1617	110.5
4	1498	47.7	1558	98.9	1618	111.7
4	1499	49.3	1559	100.4	1619	113.0
4	1500	50.5	1560	102.0	1620	114.1
4	1501	51.3	1561	103.6	1621	115.1
4	1502	52.1	1562	105.2	1622	115.9
4	1503	52.7	1563	106.8	1623	116.5
4	1504	53.4	1564	108.5	1624	116.7
4	1505	54.0	1565	110.2	1625	116.6
4	1506	54.5	1566	111.9	1626	116.2
4	1507	55.0	1567	113.7	1627	115.2
4	1508	55.6	1568	115.3	1628	113.8
4	1509	56.3	1569	116.8	1629	112.0
4	1510	57.2	1570	118.2	1630	110.1
4	1511	58.5	1571	119.5	1631	108.3
4	1512	60.2	1572	120.7	1632	107.0
4	1513	62.3	1573	121.8	1633	106.1
4	1514	64.7	1574	122.6	1634	105.8
4	1515	67.1	1575	123.2	1635	105.7
4	1516	69.2	1576	123.6	1636	105.7
4	1517	70.7	1577	123.7	1637	105.6
4	1518	71.9	1578	123.6	1638	105.3
4	1519	72.7	1579	123.3	1639	104.9
4	1520	73.4	1580	123.0	1640	104.4
4	1521	73.8	1581	122.5	1641	104.0
4	1522	74.1	1582	122.1	1642	103.8
4	1523	74.0	1583	121.5	1643	103.9
4	1524	73.6	1584	120.8	1644	104.4
4	1525	72.5	1585	120.0	1645	105.1
4	1526	70.8	1586	119.1	1646	106.1
4	1527	68.6	1587	118.1	1647	107.2
4	1528	66.2	1588	117.1	1648	108.5
4	1529	64.0	1589	116.2	1649	109.9
4	1530	62.2	1590	115.5	1650	111.3
4	1531	60.9	1591	114.9	1651	112.7
4	1532	60.2	1592	114.5	1652	113.9
4	1533	60.0	1593	114.1	1653	115.0
4	1534	60.4	1594	113.9	1654	116.0
4	1535	61.4	1595	113.7	1655	116.8
4	1536	63.2	1596	113.3	1656	117.6
4	1537	65.6	1597	112.9	1657	118.4

Table 9 (continued)

Part	Time	WLTC class 3, part 4, vehicle speed	Time	WLTC class 3, part 4, vehicle speed	Time	WLTC class 3, part 4, vehicle speed
	s	km/h	s	km/h	s	km/h
4	1658	119.2	1718	129.0	1778	49.7
4	1659	120.0	1719	129.5	1779	46.8
4	1660	120.8	1720	130.1	1780	43.5
4	1661	121.6	1721	130.6	1781	39.9
4	1662	122.3	1722	131.0	1782	36.4
4	1663	123.1	1723	131.2	1783	33.2
4	1664	123.8	1724	131.3	1784	30.5
4	1665	124.4	1725	131.2	1785	28.3
4	1666	125.0	1726	130.7	1786	26.3
4	1667	125.4	1727	129.8	1787	24.4
4	1668	125.8	1728	128.4	1788	22.5
4	1669	126.1	1729	126.5	1789	20.5
4	1670	126.4	1730	124.1	1790	18.2
4	1671	126.6	1731	121.6	1791	15.5
4	1672	126.7	1732	119.0	1792	12.3
4	1673	126.8	1733	116.5	1793	8.7
4	1674	126.9	1734	114.1	1794	5.2
4	1675	126.9	1735	111.8	1795	0.0
4	1676	126.9	1736	109.5	1796	0.0
4	1677	126.8	1737	107.1	1797	0.0
4	1678	126.6	1738	104.8	1798	0.0
4	1679	126.3	1739	102.5	1799	0.0
4	1680	126.0	1740	100.4	1800	0.0
4	1681	125.7	1741	98.6		
4	1682	125.6	1742	97.2		
4	1683	125.6	1743	95.9		
4	1684	125.8	1744	94.8		
4	1685	126.2	1745	93.8		
4	1686	126.6	1746	92.8		
4	1687	127.0	1747	91.8		
4	1688	127.4	1748	91.0		
4	1689	127.6	1749	90.2		
4	1690	127.8	1750	89.6		
4	1691	127.9	1751	89.1		
4	1692	128.0	1752	88.6		
4	1693	128.1	1753	88.1		
4	1694	128.2	1754	87.6		
4	1695	128.3	1755	87.1		
4	1696	128.4	1756	86.6		
4	1697	128.5	1757	86.1		
4	1698	128.6	1758	85.5		
4	1699	128.6	1759	85.0		
4	1700	128.5	1760	84.4		
4	1701	128.3	1761	83.8		
4	1702	128.1	1762	83.2		
4	1703	127.9	1763	82.6		
4	1704	127.6	1764	82.0		
4	1705	127.4	1765	81.3		
4	1706	127.2	1766	80.4		
4	1707	127.0	1767	79.1		
4	1708	126.9	1768	77.4		
4	1709	126.8	1769	75.1		
4	1710	126.7	1770	72.3		
4	1711	126.8	1771	69.1		
4	1712	126.9	1772	65.9		
4	1713	127.1	1773	62.7		
4	1714	127.4	1774	59.7		
4	1715	127.7	1775	57.0		
4	1716	128.1	1776	54.6		
4	1717	128.5	1777	52.2		

ANNEX 1, APPENDIX 1 SHIFTING PROCEDURES

4. Shifting procedures for vehicles equipped with manual transmissions

Kommentar [SMD2]: All paragraphs will have to be renumbered.

4.1 Gear selection calculation

4.1.1 General Approach

The following shifting procedures apply to vehicles equipped with a manual transmission. In order to take into account the technical progress and the increased variety of transmission design (e.g. 4-speed up to 7-speed gearboxes) shift points at fixed vehicle speeds are no longer appropriate. In order to reflect practical use as well as fuel efficient driving behaviour as much as possible, the prescriptions are based on the balance between the power required for driving resistance and acceleration and the power provided by the engine in all possible gears at a specific cycle phase. In order to cover the wide range of rated engine speeds (e.g. 3200 to 8000 min⁻¹) depending of the engine technology, the calculation is based on normalised engine speeds (normalised to the span between idling speed and rated engine speed) and normalised full load power curves (normalised to rated power) versus normalised engine speed.

4.1.2 Required Data

The following data is required to calculate the gears to be used during a cycle:

- (a) P_{rated} , rated engine power. The maximum power of the engine as declared by the manufacturer.
- (b) s , rated engine speed. The engine speed in min⁻¹ at which an engine develops its maximum power. If the maximum power is developed over an engine speed range, s is determined by the mean of this range.
- (c) n_{idle} , idling speed
- (d) $n_{\text{min_drive}}$, minimum engine speed for short trips, and is used to define downshifts. The minimum value is determined by the following equation:

$$n_{\text{min_drive}} = n_{\text{idle}} + (0.125)(s - n_{\text{idle}}) \quad (1)$$
 Higher values may be used if requested by the manufacturer.
- (e) $i = 1$ to $n_{\text{g_max}}$ determine the gear number
- (f) $n_{\text{g_max}}$, the number of gears
- (g) ndv_i , a ratios determined by dividing n in min⁻¹ by v in km/h for each gear i , $i = 1$ to $n_{\text{g_max}}$.
- (h) m , test mass of the vehicle in kg.
- (i) f_0, f_1, f_2 , driving resistance coefficients as defined in Annex 4.

(j) full load power curve, normalised to rated power and (rated speed – idling speed).

4.1.3. Calculation of required power

For every second j of the cycle trace the power required to overcome driving resistance and to accelerate is calculated using the following equation:

$$P_{\text{required},j} = [f_0 * v_j + f_1 * (v_j)^2 + f_2 * (v_j)^3] / 3600 + [(kr * a_j) * v_j * m_t] / 3600 \quad (2) \text{ Equation 1}$$

where:

- f_0 is the road load coefficient in N
- f_1 is the road load parameter dependent on velocity in N/(km/h)
- f_2 is the road load parameter based on the square of velocity in N/(km/h)²
- $P_{\text{required},j}$ is the power required in kW at second j
- v_j is the vehicle speed at second j in km/h,
- a_j is the vehicle acceleration at second j in m/s², $a_j = (v_{j+1} - v_j) / 3.6$
- m_t is the vehicle test mass in kg,
- kr is a factor taking the inertial resistances of the drivetrain during acceleration into account and is set to 1.1.

Kommentar [SMD3]: Sollten die (*) durch (·) ersetzt werden? Ask UNO.

4.1.4. Determination of engine speeds

For each v_j of the cycle trace and each gear i , $i = 1$ to $n_{g_{\text{max}}}$, the engine speed $n_{i,j}$ is calculated using the following equation:

$$n_{i,j} = ndv_i * v_j \quad (3) \text{ Equation 2}$$

All gears i for which $n_{\text{min}} \leq n_{i,j} \leq n_{\text{max}}$ are possible gears to be used for driving the cycle trace at v_j .

$$\begin{aligned} n_{\text{min}} &= n_{\text{min_drive}}, \text{ if } i \geq 3, \\ &= 1.25 * n_{\text{idle}}, \text{ if } i = 2, \\ &= n_{\text{idle}}, \text{ if } i = 1 \\ n_{\text{max}} &= 0.9 * (s - n_{\text{idle}}) + n_{\text{idle}}. \end{aligned}$$

If the vehicle speed, v_j , drops below 1 km/h, the gear lever is placed in neutral with the clutch engaged.

In cases where v_j is ≥ 1 km/h and $n_{1,j}$ drops below n_{idle} , the only possible gear is $n_g = 1$ and the clutch must be disengaged.

Kommentar [SMD4]: Comment from Heinz.

Kommentar [SMD5]: Comment from Heinz.

4.1.5 Calculation of available power

The available power for each possible gear i and each vehicle speed value of the cycle trace v_j is calculated using the following equation:

$$P_{\text{available},i,j} = P_{\text{norm_wot}}(n_{\text{norm},i,j}) * P_n * SM \quad (4) \text{ Equation 3}$$

where:

$$n_{\text{norm},i,j} = (n v_i * v_j - n_{\text{idle}}) / (s - n_{\text{idle}})$$

P_n is the rated power in kW

$P_{\text{norm_wot}}$ is the percentage of rated power available at $n_{\text{norm},i,j}$ at full load condition from the normalised full load power curve,

SM is a safety margin accounting for the difference between stationary full load condition power curve and the power available during transient conditions. SM is set to 0.9.

n_{idle} is the idling speed in min^{-1}

s is the rated engine speed, the engine speed in min^{-1} at which an engine develops its maximum power. If the maximum power is developed over an engine speed range, s is determined by the mean of this range.

4.1.6 Determination of possible gears to be used

The possible gears to be used are determined by:

(1) $n_{\text{min}} \leq n_{i,j} \leq n_{\text{max}}$
as defined in paragraph 4.1.4 of this annex and

(2) $P_{\text{available},i,j} \geq P_{\text{required},j}$
 $P_{\text{available},i,j}$ as defined in paragraph 4.1.5 of this annex, $P_{\text{required},j}$ as defined in paragraph 4.1.3 of this annex.

Kommentar [SMD6]: Heinz to rethink this title

Kommentar [SMD7]: Heinz to check over

The gear to be used for each second j of the cycle trace is the maximum final possible gear i_{max} .

4.2. Additional requirements for corrections/modifications of gear use

Corrections/modifications are made depending on the following requirements:

- First gear shall be selected 1 second before the beginning of an acceleration phase from standstill. Vehicle speeds below 1 km/h imply that the vehicle is standing still.
- Skipping of gears during acceleration phases is not permitted. Gears used during accelerations and decelerations must be used for a period of at least 3 seconds.
- Skipping of gears during deceleration phases is permitted. For the last phases of a deceleration down to stop, the clutch may be either disengaged or the gear lever in neutral position and the clutch engaged.

(d) There shall be no gearshift during the transition from an acceleration phase to a deceleration phase.

(e) If a gear i is used for a time sequence of 1 to 5 s and the gear before this sequence is the same as the gear after this sequence, e.g. $i-1$, the gear use for this sequence is corrected to $i-1$.

That means:

(1) a gear sequence $i-1, i, i-1$ is replaced by $i-1, i-1, i-1$

(2) a gear sequence $i-1, i, i, i-1$ is replaced by $i-1, i-1, i-1, i-1$

(3) a gear sequence $i-1, i, i, i, i-1$ is replaced by $i-1, i-1, i-1, i-1, i-1$

(4) a gear sequence $i-1, i, i, i, i, i-1$ is replaced by $i-1, i-1, i-1, i-1, i-1, i-1$

(5) a gear sequence $i-1, i, i, i, i, i, i-1$ is replaced by $i-1, i-1, i-1, i-1, i-1, i-1, i-1$.

for all cases (1) to (5), $g_{\min} \leq i$ must be fulfilled.

(f) a gear sequence $i, i-1, i$, is replaced by i, i, i , if the following conditions are fulfilled:

(1) the engine speed does not drop below n_{\min} and

(2) These corrections do not occur more often than 4 times each for the low, medium and high speed cycle parts and not more than 3 times for the extra high speed part.

The requirement (2) is necessary, because the available power will drop below the required power, when the gear $i-1$ is replaced by i . And this should not occur too frequently.

(g) If during an acceleration phase a lower gear is required at a higher vehicle speed, the higher gears before are corrected to the lower gear, if the lower gear is required for at least 2 s.

Example: $v_j < v_{j+1} < v_{j+2} < v_{j+3} < v_{j+4} < v_{j+5} < v_{j+6}$. The originally calculated gear use is 2, 3, 3, 3, 2, 2, 3. In this case the gear use will be corrected to 2, 2, 2, 2, 2, 2, 3.

Since the above modifications may create new gear use sequences which are in conflict with these requirements, the gear sequences shall be checked twice.

Kommentar [SMD8]: DC to rewrite