



Test Data and Support Information
for:

The Ecotek CB-26P

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Test Data and Support Information
for:
The Ecotek CB-26P

SECTION 1:
Datron Performance Tests at Millbrook



Date of test	- 3 February 2005 – Product test Ecotek CB-26P.
Venue	- Millbrook Proving Ground – Straight, flat mile track.
Weather	- Clear, dry, damp track, minimal wind, temp ~ 10degC
Data System	- Datron microSAT # R20-102
Client	- Ecotek Technologies Plc. - 8 Manor Crescent, Surbiton, Surrey. KT5 8LQ - Tel: 020 – 8287 3472

MicroSAT uses a survey-grade, fast GPS receiver to give precise measurements of velocity and position. Its primary function is to measure the performance of road vehicles; such as acceleration tests, brake tests, lap timing or other more advanced measurements and is used by most vehicle manufacturers.

microSAT features include:

- Self-calibrating - the measurements made by the microSAT are independent of the internal components. Instead it is constantly calibrated by the GPS satellite system itself.
- Stand-Alone operation when connected to a Windows based PC using the software provided to conduct a large number of different tests.
- Easy Integration into bigger acquisition systems - the microSAT has CAN, Analogue and Digital Pulse outputs; these can be fitted to virtually all data acquisition systems.
- On-board memory - stores the results of your tests internally, with no need for any external systems. View the results of your tests using powerful 2D software afterwards or replay it through microSAT RT software. Ideal for racing applications.
- 2cm position accuracy - the high-precision GPS card used in microSAT enables 20cm and 2cm positioning modes are possible with a fixed base reference used for absolute corrections
- The velocity is accurately tracked by the GPS system to within 0.1kmh up to speeds in excess of 1,600 kmh. The distance derived when carrying out performance tests is calculated by integrating the velocity measurement, this method is offers the highest level of displacement accuracy.

Datron Technology Limited was formed in 1990 and has been providing high technology and cost effective data logging and acquisition solutions to various manufacturing industries ever since. Datron speed and distance measuring equipment enjoys a world-wide reputation for accuracy and ease of use. Datron is able to apply instrumentation to any vehicle and acquire and evaluate almost any relevant variable of movement and position.

Over the years, the increasing requirement for its specialist non-contact, slip-free, distance and speed measuring equipment has enabled Datron to develop into an international operating company, supplying a wide range of instrumentation products for industry, motor racing and law enforcement agencies Worldwide.

Test Vehicles

- Peugeot 106 1.1i
- Model Year 2001
- Chassis/engine:VF 31 CHFXF52668189
- Reg. Y769 BPB
- Mileage: 13,700
- Volkswagen Polo 1.4i 16Valve
- 2001 Model
- Chassis No WVV2226KZ2R502425
- Engine No VWZ122A5800420
- Reg No Y32EOL
- Mileage 26,047

- Ford Fiesta 1.3i (Endura engine)
- 2001 Model
- Chassis NoWFOAXXBAJAYC80480
- Engine No YC80480
- Reg No Y665VKH
- Mileage 23,917

Test Format

To establish if any real performance gains arise when using the Ecotek CB-26P by carrying out a series of through gear acceleration runs. A start speed of 10mph was selected to remove as many variables as possible such as launch clutch action, the end speed of 85mph was determined by the length of test track available. This report includes a series of before (std) & after (mod) tests in each direction showing changes in vehicle acceleration times.

Test Procedure

Each test car was driven directly from the Prodrive Laboratories (where urban cycle emission and consumption tests had been conducted over the previous week) to the Millbrook Proving Ground where the Datron microSAT # R20-102 equipment was fitted and calibrated and from there to the Mile test track. No other alterations to the cars were made until after a series of 10-85 mph acceleration runs were undertaken to establish un-modified base times. Then a single CB-26P unit was fitted to each car by Ecotek engineers and the runs repeated. References in the report to modified (mod) and Standard (std) reflect cars with and without the Ecotek CB-26P device.

The test was conducted and supervised by John Grist, Datron's General Manager, who carried out of the all the driving and data logging personally.

Test Data

Ford						
std 1			std 2			
Time(s)	Speed(mph)	Distance(m)	Time(s)	Speed (mph)	Distance(m)	
0	10	0	0	10	0	
0.719	15	3.99	0.73	15	4.11	
1.449	20	9.71	1.479	20	10.02	
2.391	25	19.29	2.331	25	18.65	
3.708	30	35.2	3.544	30	33.32	
4.966	35	53.52	4.75	35	50.87	
6.325	40	76.4	6.057	40	72.78	
7.885	45	106.09	7.614	45	102.4	
10.116	50	153.39	9.691	50	146.51	
12.351	55	205.93	11.863	55	197.42	
14.867	60	270.71	14.345	60	261.35	
17.805	65	352.87	17.185	65	340.85	
21.896	70	476.53	20.986	70	455.66	
26.847	75	637.29	26.217	75	624.91	
33.139	80	855.67	32.381	80	838.63	
42.818	85	1213.09	42.977	85	1230.26	

Ford						
mod 1			mod 2			
Time(s)	Speed(mph)	Distance(m)	Time(s)	Speed (mph)	Distance(m)	
0	10	0	0	10	0	
0.754	15	4.19	0.704	15	3.94	
1.459	20	9.72	1.434	20	9.68	
2.292	25	18.12	2.284	25	18.27	
3.392	30	31.36	3.344	30	31.04	
4.663	35	49.83	4.689	35	50.48	
5.94	40	71.32	5.958	40	71.83	
7.38	45	98.75	7.478	45	100.77	
9.335	50	140.35	9.423	50	142.16	
11.618	55	193.69	11.699	55	195.4	
13.866	60	251.51	14.064	60	256.3	
16.635	65	328.94	16.948	65	337.08	
20.022	70	431.26	20.959	70	458.79	
24.386	75	572.58	25.341	75	601.15	
29.724	80	757.88	31.45	80	813.02	
37.205	85	1034.18	41.137	85	1171.13	

Peugeot						
std 1			std 2			
Time(s)	Speed(mph)	Distance(m)	Time(s)	Speed (mph)	Distance (m)	
0	10	0	0	10	0	
0.614	15	3.48	0.626	15	3.52	
1.197	20	8.06	1.222	20	8.2	
1.89	25	15.05	1.959	25	15.66	
2.884	30	27.16	2.926	30	27.41	
3.911	35	42.15	4.008	35	43.12	
5.002	40	60.45	5.168	40	62.59	
6.234	45	83.9	6.381	45	85.64	
7.69	50	114.92	7.909	50	118.13	
9.644	55	160.63	9.908	55	164.79	
11.576	60	210.37	11.902	60	216.09	
13.852	65	274.1	14.247	65	281.75	
16.597	70	357.12	17.047	70	366.4	
20.509	75	483.85	20.844	75	489.49	
24.999	80	639.59	25.204	80	640.7	
31.183	85	868	31.391	85	869.46	

Peugeot						
mod 1			mod 2			
Time(s)	Speed(mph)	Distance(m)	Time(s)	Speed (mph)	Distance(m)	
0	10	0	0	10	0	
0.626	15	3.51	0.679	15	3.74	
1.22	20	8.18	1.275	20	8.43	
1.909	25	15.16	1.961	25	15.35	
3.037	30	29.16	3.057	30	28.87	
3.946	35	42.53	3.972	35	42.31	
5.057	40	61.18	5.128	40	61.72	
6.247	45	83.83	6.327	45	84.54	
7.657	50	113.82	7.745	50	114.65	
9.558	55	158.3	9.714	55	160.69	
11.397	60	205.55	11.618	60	209.68	
13.616	65	267.56	13.838	65	271.74	
16.317	70	349.26	16.494	70	352	
19.974	75	467.84	20.087	75	468.49	
24.226	80	615.27	24.076	80	606.89	
29.775	85	820.19	29.446	85	805.35	

VW						
std 1			std 2			
Time(s)	Speed(mph)	Distance(m)	Time(s)	Speed (mph)	Distance (m)	
0	10	0	0	10	0	
0.657	15	3.67	0.658	15	3.64	
1.303	20	8.72	1.304	20	8.7	
1.984	25	15.6	1.968	25	15.42	
3.278	30	31.61	3.091	30	29.28	
4.282	35	46.17	4.084	35	43.74	
5.299	40	63.23	5.122	40	61.16	
6.594	45	87.86	6.387	45	85.25	
8.694	50	132.04	8.357	50	126.67	
10.29	55	169.57	9.942	55	163.88	
12.058	60	215.04	11.782	60	211.22	
14.314	65	278.08	14.016	65	273.76	
17.291	70	367.64	17.179	70	368.85	
20.09	75	458.42	20.245	75	468.25	
23.629	80	581.13	23.859	80	593.61	
28.341	85	755.08	28.834	85	777.26	

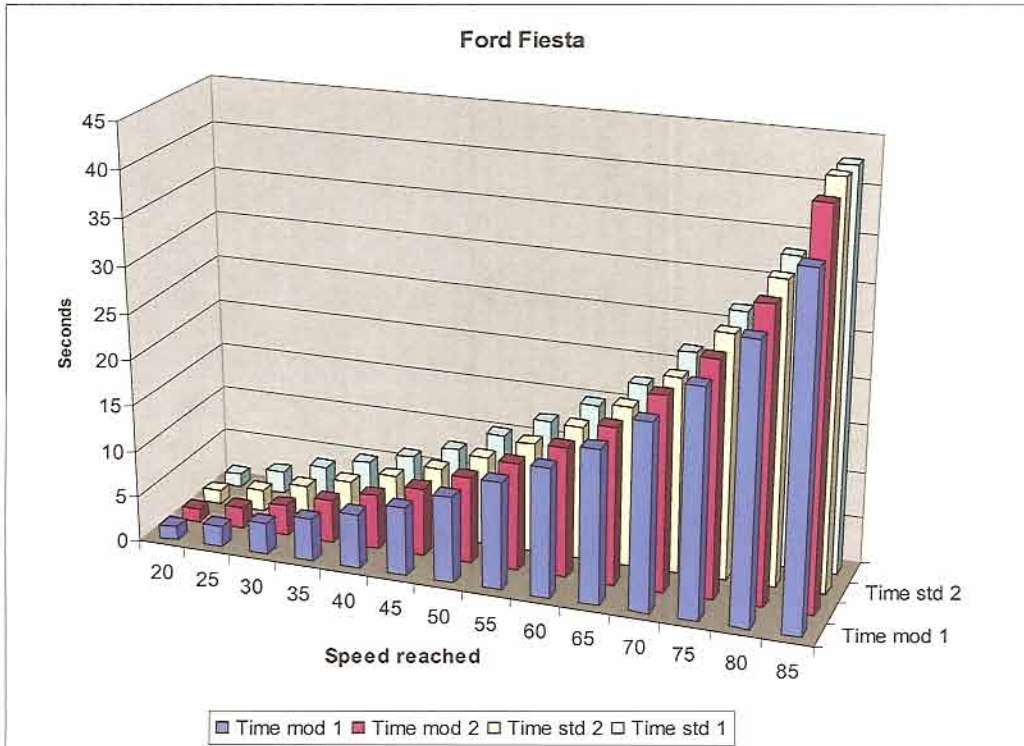
VW						
mod 1			mod 2			
Time(s)	Speed(mph)	Distance(m)	Time(s)	Speed (mph)	Distance(m)	
0	10	0	0	10	0	
0.656	15	3.7	0.496	15	2.77	
1.273	20	8.53	1.173	20	8.02	
1.939	25	15.24	1.837	25	14.73	
3.1	30	29.6	2.974	30	28.79	
4.062	35	43.6	3.966	35	43.2	
5.082	40	60.69	5.017	40	60.85	
6.357	45	84.99	6.248	45	84.33	
8.246	50	124.78	8.25	50	126.46	
9.814	55	161.6	9.818	55	163.23	
11.598	60	207.57	11.615	60	209.45	
13.698	65	266.39	13.827	65	271.44	
16.793	70	359.55	16.98	70	366.46	
19.543	75	448.82	19.714	75	455.23	
22.793	80	561.58	23.116	80	573.18	
27.212	85	724.78	27.809	85	746.54	

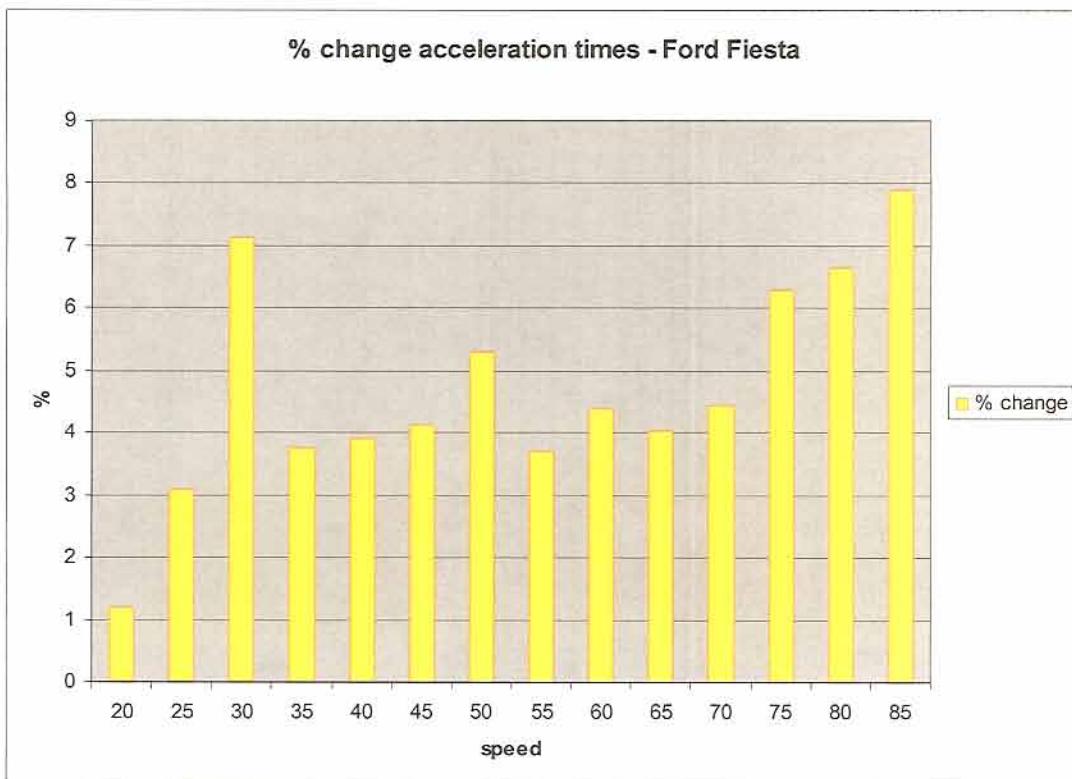
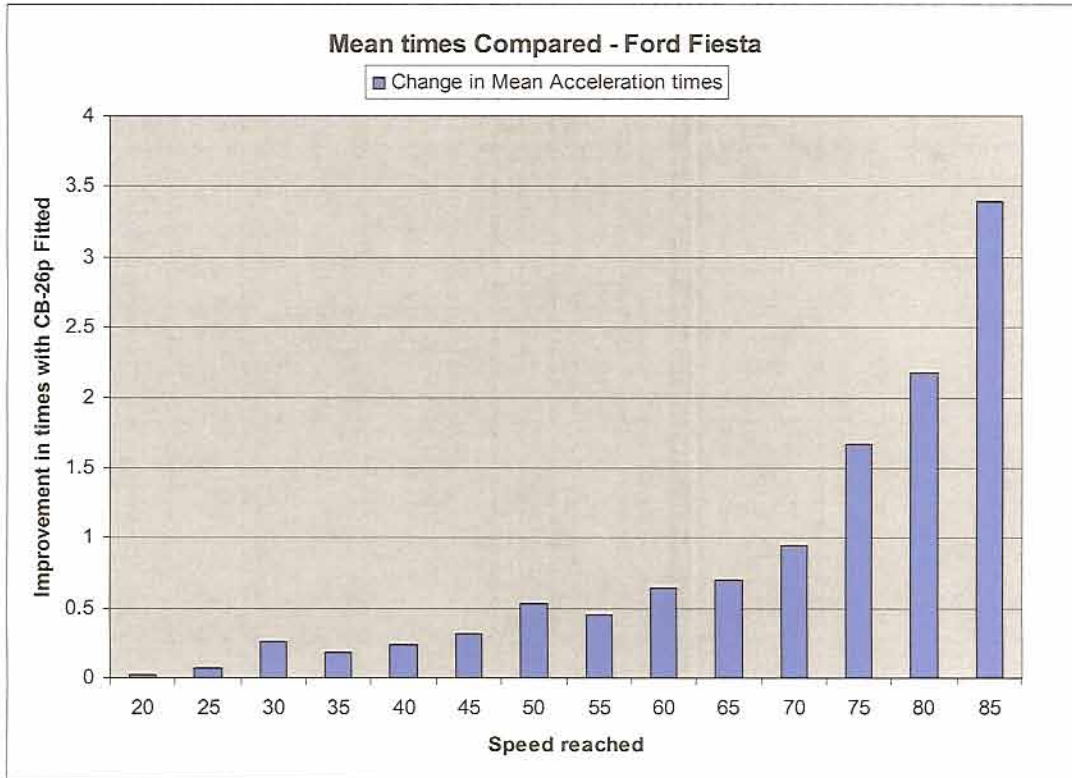
Analysis

Ford Fiesta 1.3i (Endura engine)
 2001 Model
 Chassis NoWFOAXXBAJAYC80480
 Engine No YC80480
 Reg No Y665VKH
 Mileage 23,917

Ford							
speed	20	25	30	35	40	45	50
mean of std	1.464	2.361	3.626	4.858	6.191	7.7495	9.9035
mean of mod	1.4465	2.288	3.368	4.676	5.949	7.429	9.379
Change in Mean Acceleration times	0.0175	0.073	0.258	0.182	0.242	0.3205	0.5245
% change	1.195355	3.09191	7.115279	3.746398	3.9089	4.135751	5.296107

speed	60	65	70	75	80	85
mean of std	14.606	17.495	21.441	26.532	32.76	42.8975
mean of mod	13.965	16.7915	20.4905	24.8635	30.587	39.5115
Change in Mean Acceleration times	0.641	0.7035	0.9505	1.6685	2.173	3.386
% change	4.388607	4.021149	4.433095	6.288633	6.633089	7.893234

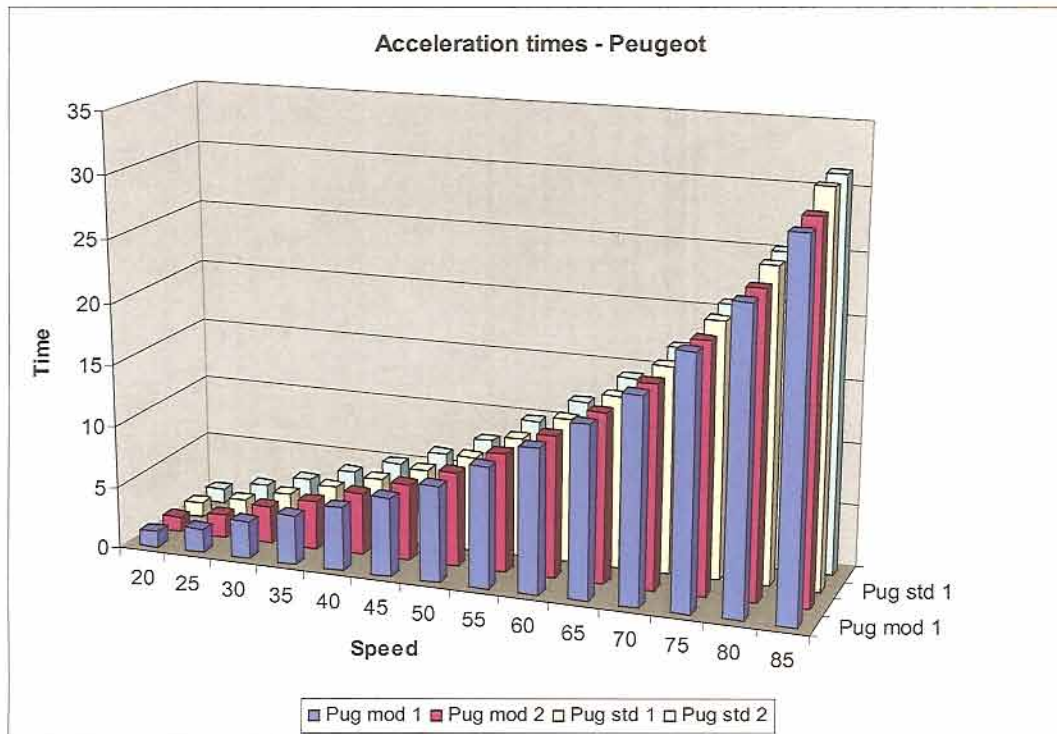


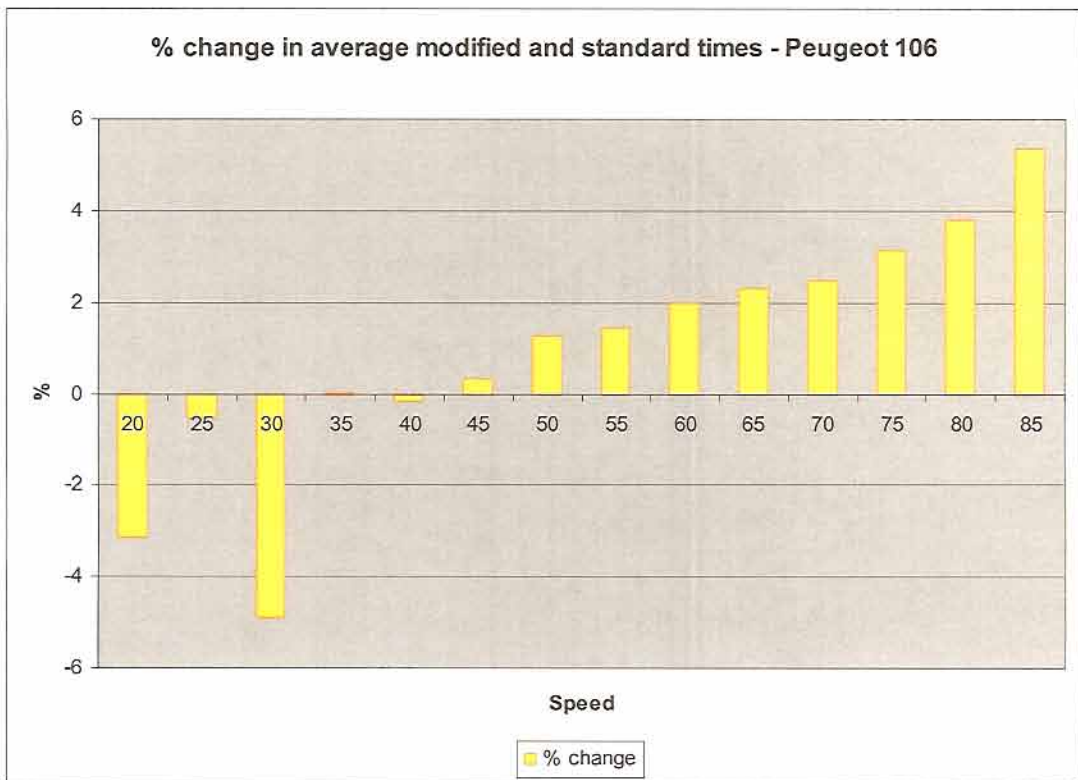
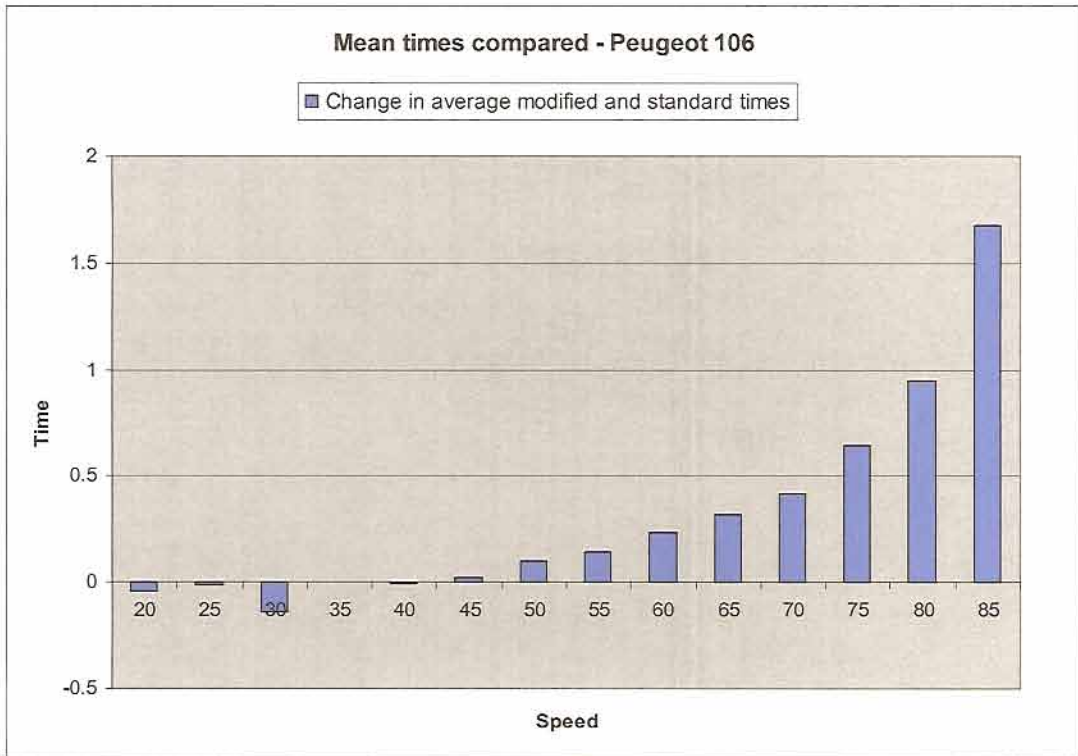


Peugeot 106 1.1i
 Model Year 2001
 Chassis/engine:VF 31 CHFXF52668189
 Reg. Y769 BPB
 Mileage: 13,700

speed	20	25	30	35	40	45	50
Pug mod 1	1.275	1.961	3.057	3.972	5.128	6.327	7.745
Pug mod 2	1.22	1.909	3.037	3.946	5.057	6.247	7.657
Pug std 1	1.197	1.89	2.884	3.911	5.002	6.234	7.69
Pug std 2	1.222	1.959	2.926	4.008	5.168	6.381	7.909
Mean std	1.2095	1.9245	2.905	3.9595	5.085	6.3075	7.7995
Mean mod	1.2475	1.935	3.047	3.959	5.0925	6.287	7.701
Mean change	-0.038	-0.0105	-0.142	0.0005	-0.0075	0.0205	0.0985
% change	-3.14179	-0.5456	-4.88812	0.012628	-0.14749	0.32501	1.262901

speed	55	60	65	70	75	80	85
Pug mod 1	9.714	11.618	13.838	16.494	20.087	24.076	29.446
Pug mod 2	9.558	11.397	13.616	16.317	19.974	24.226	29.775
Pug std 1	9.644	11.576	13.852	16.597	20.509	24.999	31.183
Pug std 2	9.908	11.902	14.247	17.047	20.844	25.204	31.391
Mean std	9.776	11.739	14.0495	16.822	20.6765	25.1015	31.287
Mean mod	9.636	11.5075	13.727	16.4055	20.0305	24.151	29.6105
Mean change	0.14	0.2315	0.3225	0.4165	0.646	0.9505	1.6765
% change	1.432079	1.972059	2.295455	2.475924	3.12432	3.786626	5.358456

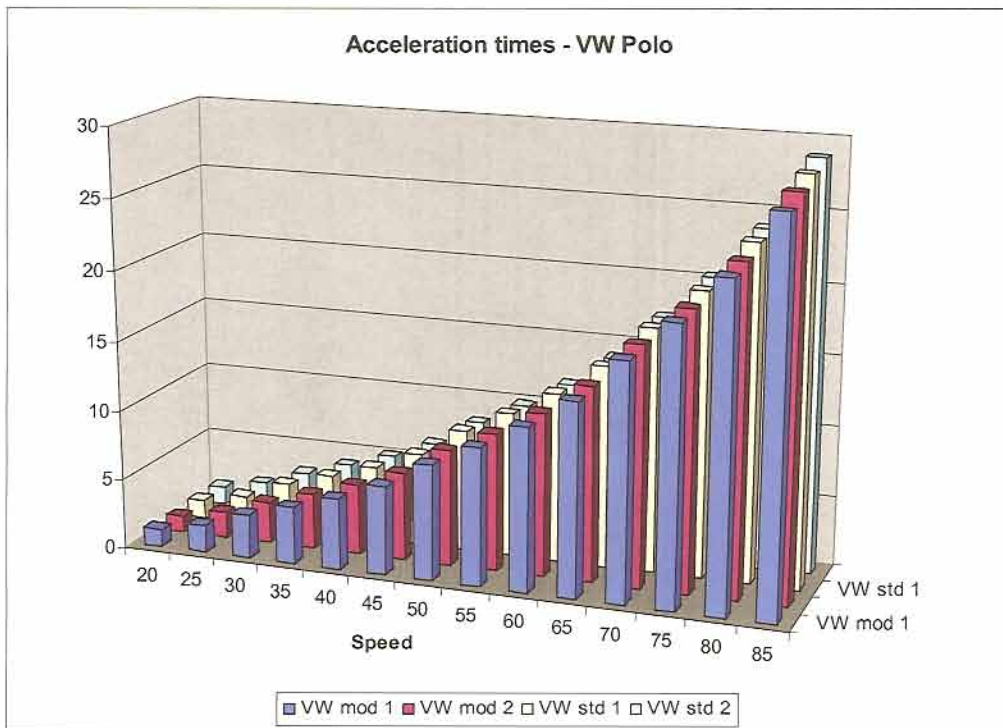


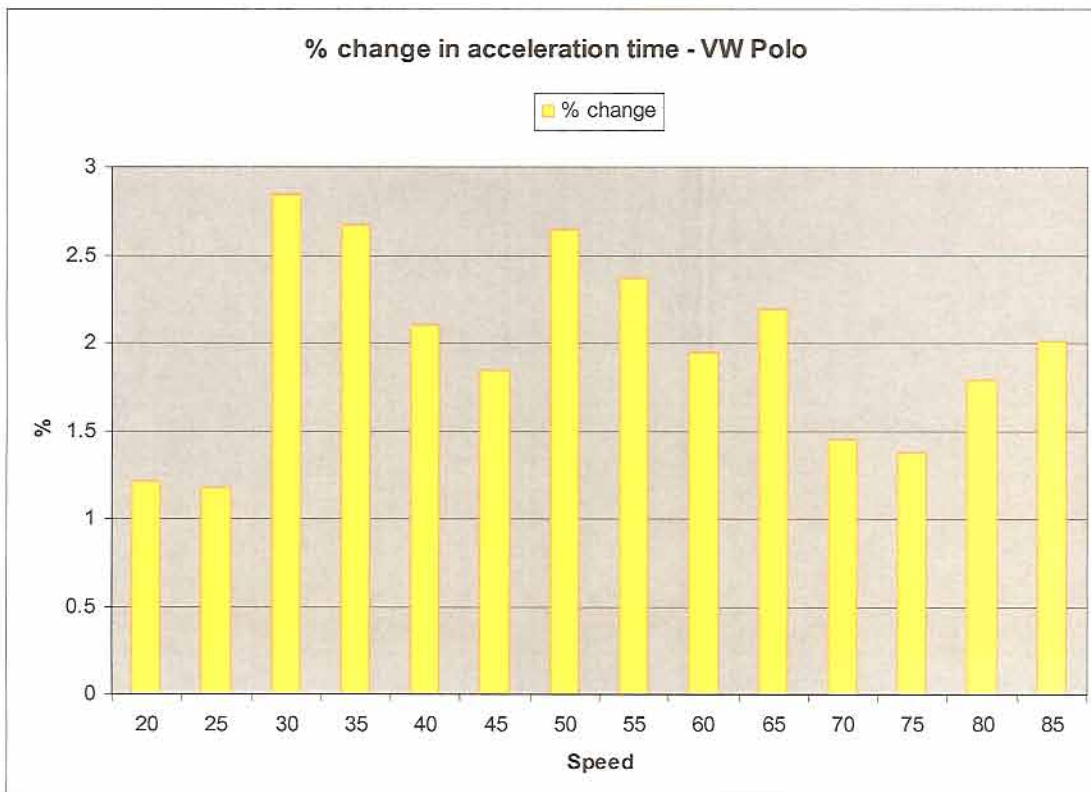
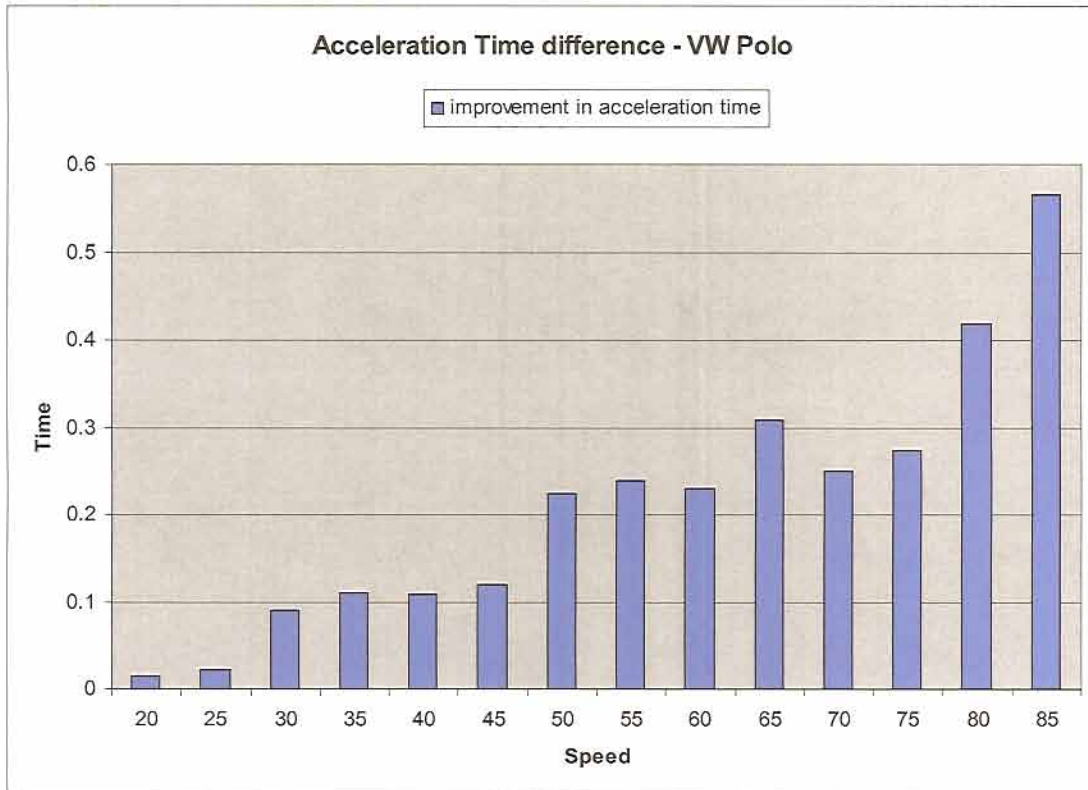


Volkswagen Polo 1.4i 16Valve
 2001 Model
 Chassis No WVW2226KZ2R502425
 Engine No VWZ122A5800420
 Reg No Y32EOL
 Mileage 26,047

speed	20	25	30	35	40	45	50
VW mod 1	1.273	1.939	3.1	4.062	5.082	6.357	8.246
VW mod 2	1.173	1.837	2.974	3.966	5.017	6.248	8.25
VW std 1	1.303	1.984	3.278	4.282	5.299	6.594	8.694
VW std 2	1.304	1.968	3.091	4.084	5.122	6.387	8.357
VW mean mod	1.223	1.888	3.037	4.014	5.0495	6.3025	8.248
VW mean std	1.238	1.9105	3.126	4.124	5.158	6.421	8.472
Mean time diff	0.015	0.0225	0.089	0.11	0.1085	0.1185	0.224
% change	1.211632	1.177702	2.847089	2.667313	2.103528	1.845507	2.644004

speed	55	60	65	70	75	80	85
VW mod 1	9.814	11.598	13.698	16.793	19.543	22.793	27.212
VW mod 2	9.818	11.615	13.827	16.98	19.714	23.116	27.809
VW std 1	10.29	12.058	14.314	17.291	20.09	23.629	28.341
VW std 2	9.942	11.782	14.016	17.179	20.245	23.859	28.834
VW mean mod	9.816	11.6065	13.7625	16.8865	19.6285	22.9545	27.5105
VW mean std	10.054	11.8365	14.0705	17.1355	19.902	23.3725	28.075
Mean time diff	0.238	0.23	0.308	0.249	0.2735	0.418	0.5645
% change	2.367217	1.943142	2.188977	1.453124	1.374234	1.788427	2.010686

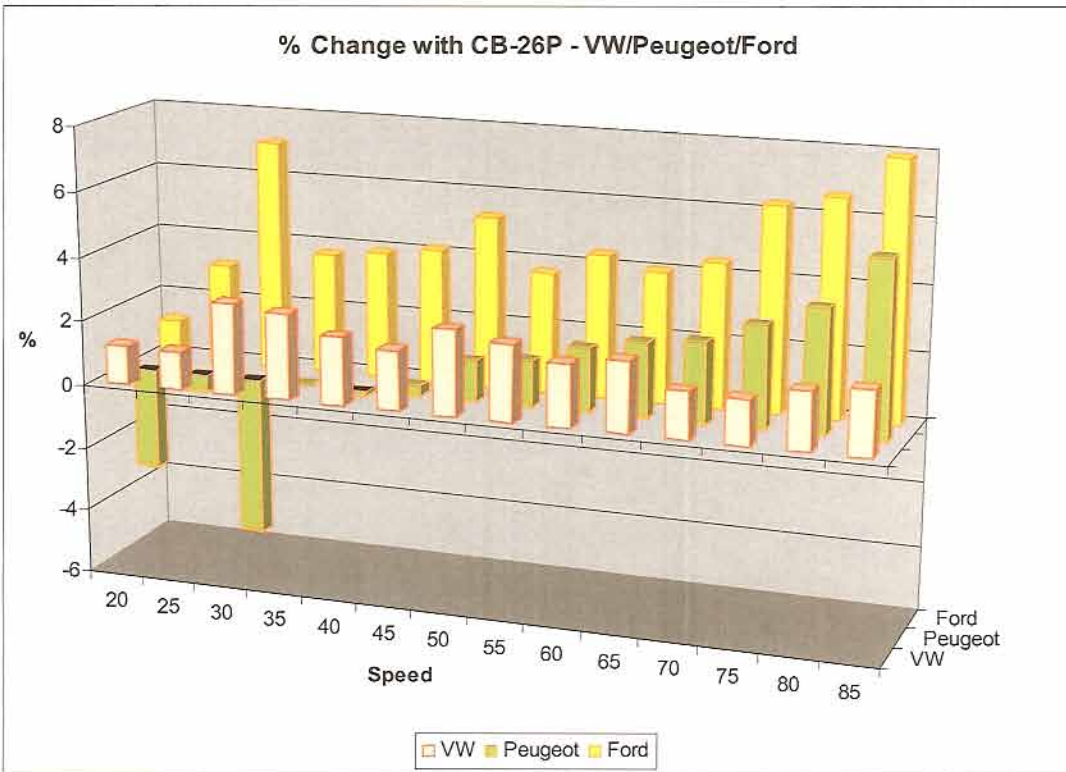
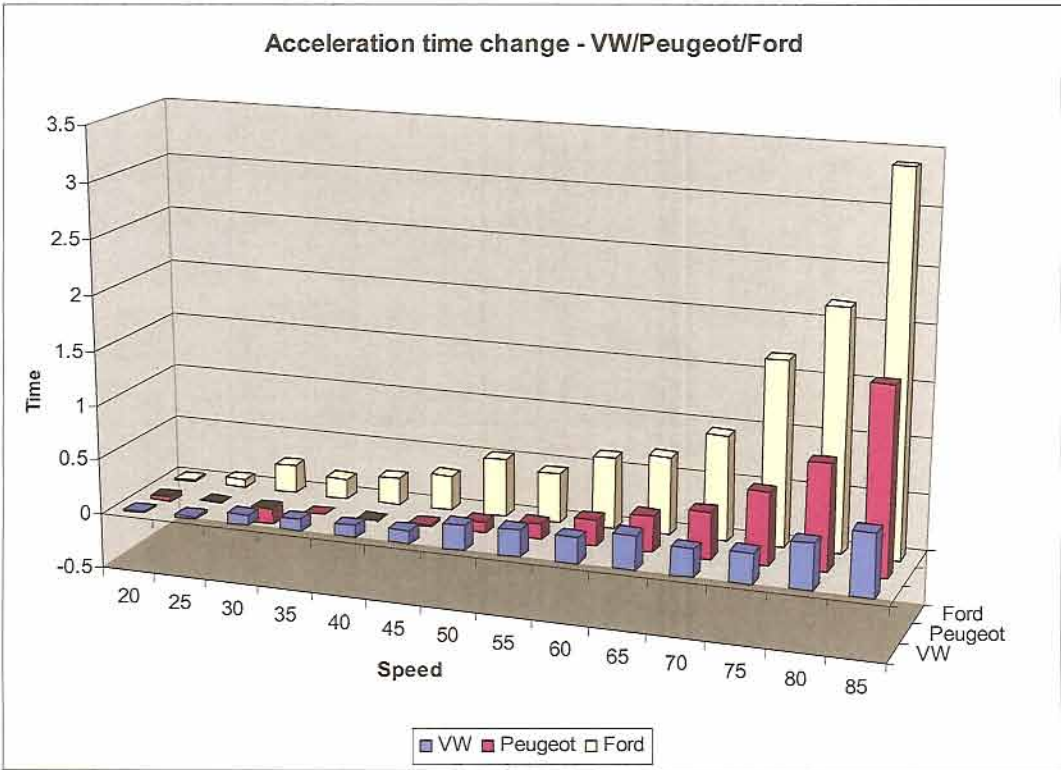




Combining these results for all cars

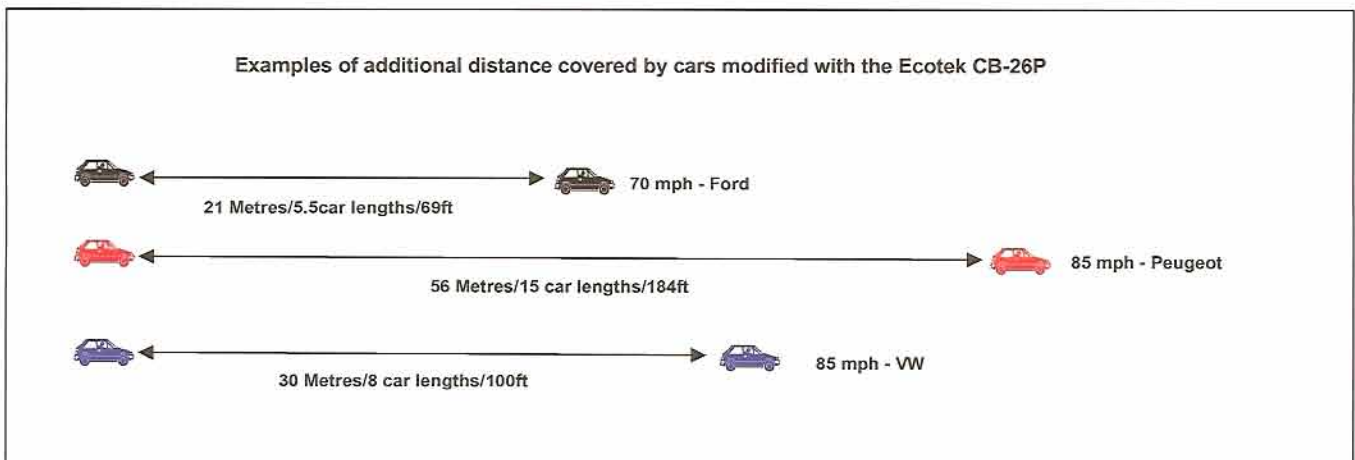
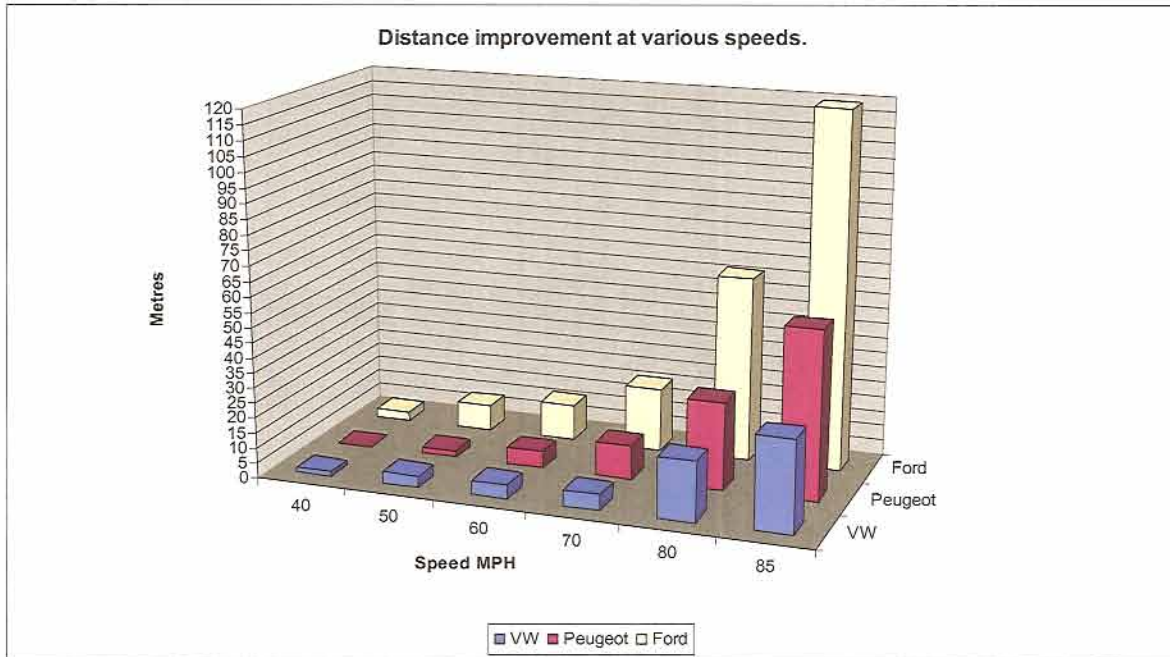
All Cars							
Time difference							
VW	0.015	0.0225	0.089	0.11	0.1085	0.1185	0.224
Peugeot	-0.038	-0.0105	-0.142	0.0005	-0.0075	0.0205	0.0985
Ford	0.0175	0.073	0.258	0.182	0.242	0.3205	0.5245
speed	20	25	30	35	40	45	50
% Change							
VW	1.211632	1.177702	2.847089	2.667313	2.103528	1.845507	2.644004
Peugeot	-3.14179	-0.5456	-4.88812	0.012628	-0.14749	0.32501	1.262901
Ford	1.195355	3.09191	7.115279	3.746398	3.9089	4.135751	5.296107

All Cars							
Time difference							
VW	0.238	0.23	0.308	0.249	0.2735	0.418	0.5645
Peugeot	0.14	0.2315	0.3225	0.4165	0.646	0.9505	1.6765
Ford	0.4485	0.641	0.7035	0.9505	1.6685	2.173	3.386
speed	55	60	65	70	75	80	85
% Change							
VW	2.367217	1.943142	2.188977	1.453124	1.374234	1.788427	2.010686
Peugeot	1.432079	1.972059	2.295455	2.475924	3.12432	3.786626	5.358456
Ford	3.704468	4.388607	4.021149	4.433095	6.288633	6.633089	7.893234



Results expressed as average (mean) distance between std and mod cars.

speed		30	40	50	60	70	80	85
average								
distance	VW	1.25	1.425	3.735	4.62	5.24	19.99	30.51
metres	Peugeot	-1.73	0.07	2.29	5.615	11.13	29.065	55.96
	Ford	3.06	3.015	8.695	12.125	21.07	61.7	119.02



Testers Comments Both the Ford and Peugeot cars appeared more urgent/responsive with the device fitted. The Peugeot may have developed an element of wheel-spin when selecting second gear on a slightly damp track with the device fitted (as evidenced by the analysed results) and the VW whilst not exhibiting such a noticeable improvement at slower speeds, felt more responsive at higher speeds.

Conclusions It is clearly established by an analysis of the data that the device improved the performance of all three cars during the test.

With the exception of the Peugeot up to 45 mph (due most probably to loss of traction on a damp track) all the remaining data comparisons, whether averaged or not, showed improvements in mean acceleration times between 10 mph and 85 mph, with the device fitted, of between 1.211% and 7.89%.

The device appears to work most effectively under conditions of throttle variation and further tests are being conducted to analyse perceived benefits to in gear acceleration at motorway speeds.



Signed on behalf of Datron Technology Limited

By: JOHN CRIST

Date: 4 MARCH 2005

**Datron Technology, 5-6 Potters Lane,
Kiln Farm, Milton Keynes MK11 3HE
Tel: 00 44 (0)1908 261655
Fax: 00 44 (0)1908 260108**





Test Data and Support Information
for:
The Ecotek CB-26P

SECTION 2:
Prodrive Laboratory Tests

Analysis of Prodrive Consumption and Emissions Tests.

Date: January 27th to 3rd February 2005

Test:

To test three vehicles as standard and modified by the fitment of an **Ecotek CB-26P** device, with a view to establishing any change in fuel consumption and any associated effects on vehicle exhaust emissions.

Test Cars:

- Peugeot 106 1.1i. 2001/2/3 Model. Chassis/engine: VF 31 CHFXF52668189. Reg. Y769 BPB. Mileage: 13,700
- Volkswagen Polo 1.4i 16Valve 2001/2 Model. Chassis No: WWW2226KZ2R502425. Engine No: VWZ122A5800420. Reg No Y32EOL. Mileage 26,047
- Ford Fiesta 1.3i (Endura engine) 2001/2 Model. Chassis: NoWFOAXXBAJAYC80480 Engine No: YC80480. Reg No Y665VKH. Mileage 23,917

Test Format:

Prodrive Laboratories in Milton Keynes were selected to perform the tests as they provide one of the most comprehensive test services. The Prodrive emissions lab is fully certified by the UK Vehicle Certification Agency and accordingly provides some of the most accurate and reliable data available.

Upon completion of a satisfactory Pre-Conditioning Tests, the vehicles were tested in two forms: Standard Emissions Verification and Modified Condition (Ecotek device fitted).

Pre-conditioning Test:

Firstly, with the vehicle in standard condition and with no additional after-market equipment, a Pre-Conditioning test took place. This takes the form of a standard Euro 3 ECE 1505 vehicle emissions test. This test allows the facility to verify the vehicle and dyno performance, without the restriction and cost incurred of a fully validated test. It also conditions the vehicle to the driving conditions experienced during the drive cycle, which are substantially different to those encountered during normal road driving.

On conclusion of a satisfactory Pre-Conditioning test, each vehicle was put into Prodrive's vehicle soak area for the minimum mandatory six hours, before which a valid and certified test may not take place.

Standard Emissions Verification:

Upon completion of the minimum soak time each of the vehicles were subjected to their first validated ECE 1505 Drive Cycle Test, during which emissions data in the form of exhaust gas analysis was derived, together with an electronic copy of second by second emissions data.

At the conclusion of the test, the exhaust gas analyser equipment generates a document which details all aspects of the vehicle's exhaust emissions particulates: Carbon Monoxide, Hydrocarbons, Oxides of Nitrogen and Carbon Dioxide, in the form of a mass/distance format. For example, CO₂ (carbon dioxide) will be expressed in g/km.

Additionally the program uses the carbon balance method of analysis to compute a certified fuel consumption figure, in MPG, MP/USG, and l/100 km. All of which are verified by the VCA.

These tests were run a total of three times in order to produce an averaged value of all the emissions figures. This ensures an even spread of result data and removes any spurious data from the process, giving further credence to the end results.

Modified Condition Tests:

Once the vehicles were tested in standard form, the Ecotek device was fitted in accordance with the product instructions. The vehicles then underwent a further Pre-Conditioning test to ensure that any shift in the vehicles operating window, affected by the introduction of the device, has time to adapt before the official test procedure begins.

The timetable for the second phase of testing followed that of the first, and a further three tests for each vehicle were conducted under similar strict operating conditions.

The vehicles were tested using the European drive cycle, which is the current standard vehicle test procedure used to establish new vehicle emissions and fuel consumption data, this test is the only test recognised by the European Union for establishing and verifying new car emissions. To this end the results obtained can be relied upon as definitive.

The test takes the form of a simulated urban Euro 3 ECE 1505 Emissions Drive Cycle on an indoor laboratory dynamometer, followed by a simulated high speed drive cycle. From this data both urban and high speed fuel consumption and emissions data are collected and are used to obtain a combined overall fuel consumption and emissions figures. These are the same figures supplied by manufacturers in their vehicle specification being determined in exactly the same way.

The tests use a Horiba 9000@ series gas analyser to collect and test the vehicle exhaust emissions, the Horiba equipment is recognised to be the standard in the industry, again giving a high confidence level in the results of the tests. During the test, whilst the vehicle is being driven, the analyser is taking a constant sample of the vehicle exhaust gas.

This sample is stored in a common bag, one for each of the two phases of the cycle and one each for sampling the background emissions within the lab itself. This ensures that any free air emissions are excluded from the test data, again ensuring the accuracy of the results.

Upon completion of the test the analyser samples the stored gas and equates the quantity of pollutants in each of the bags and then converts that into a common figure of mass of pollutant per kilometre driven for each phase of the cycle. This is then collated into the test results to give the final pollutant figures, plus the overall fuel consumption of the vehicle in miles per gallon or litres per km.

Analysis:

The raw data from Prodrive was analysed independently by Steve Wills MEng, HNC. of Chalgrove, Oxfordshire a specialist automotive engineer with engine development participation in Group C, WRC, BTCC and GT classes; as well as considerable experience in vehicle emissions tuning and certification, together with the latest engine management and data acquisition systems.

Test Results - All Emissions in grammes per Km (see charted data)

Vehicle	Fuel Consumption	CO	CO2	HC	NoX	HC+NoX
Peugeot Std	42.11 Miles/Gallon	.145	151.4	.059	.059	.118
Peugeot Mod	42.79 Miles/Gallon	.161	148.9	.058	.058	.116
Fiesta Std	38.66 Miles/Gallon	.522	164.3	.053	.068	.121
Fiesta Mod	39.07 Miles/Gallon	.434	162.7	.048	.075	.123
Polo Std	37.77 Miles/Gallon	.376	168.5	.056	.039	.097
Polo Mod	38.11 Miles/Gallon	.352	166.9	.058	.042	.100

The Peugeot saw a reduction in fuel consumption from 42.1 to almost 42.8 Mpg on the combined analysis. This is a reduction of 1.6%. It can also be seen that there is a benefit in CO₂ emissions, the Peugeot saw a reduction from 151.4 grammes per kilometre down to 148.9, a reduction of 1.7% on the standard vehicle.

Both the Hydrocarbon and NoX (oxides of nitrogen) emissions were marginally reduced also. Overall the vehicle emissions were reduced, the increase in CO emission may largely be due to test variance and is not regarded as a significant pollutant. CO₂ and NoX are generally accepted as the most important areas for emission control and both have been reduced by the introduction of the Ecotek device.

The Fiesta had a reduction in fuel consumption from 38.66 to 39.07 Mpg, a reduction of almost 1.1%. CO₂ was again reduced from 164.3 g/km down to 162.7 g/km, a reduction of just under 1%. Both CO and Hydrocarbon emissions were also reduced, together with a marginal increase in NoX.

The Polo saw a reduction in fuel consumption from 37.77 up to 38.11 Mpg, a reduction of 0.9%, CO₂ was again reduced down to 166.9 g/km from 168.5, a reduction of 0.96% over the standard vehicle. There were marginal increases in both Hydrocarbons and NoX, but not to significantly affect the overall benefit gained. The difference between the standard and modified vehicle on the combined HC+Nox analysis is only 0.03 g/km, and this overall rating still achieves Euro 4 compliance, on a Euro 3 vehicle so this is not deemed to be an adverse result.

Conclusions:

The addition of the Ecotek CB-26P device to these three vehicles saw a reduction in both fuel consumption and CO₂ emissions in all cases.

The Fuel consumption reduction is maybe not as apparent under these test conditions with a reduction in the order of 1 to 1.5% on each vehicle, however it does confirm that the unit is of benefit, even under tight test procedures. In general open road driving it is quite conceivable that these gains may be significantly increased.

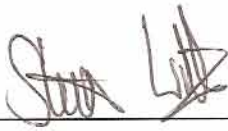
The reduction of CO₂ is also a significant side effect, although the reduction is again of the order of 1 to 1.5%, any reduction of CO₂ emissions should be regarded as beneficial. The CO₂ reduction is most likely due to the dilution effect of introducing un-metered air into the inlet manifold but for whatever the reason, the result should be regarded as worthwhile.

This introduction of un-metered air would normally give rise to the expectation that the NoX emissions would increase. Typically, additional combustive oxygen in the mixture, which has not been quantified by the cars engine management system, will increase the combustion temperature, due to a slightly leaner mixture, and subsequently increase the production of oxides of nitrogen (NoX), a linking of nitrogen to the excess oxygen in the combustion process.

Surprisingly, save for a small increase on the Fiesta, the NoX emissions were the same, if not better with the Ecotek device fitted. Given the overall scheme of the tests this can be seen as a benefit, as it would have been expected by the apparent nature of operation of the device, that these emissions would have significantly increased. This has turned out not to be the case; giving rise to the potential likelihood of genuine combustion improvements being generated by the Ecotek CB-26P device.

Data:

The following pages detail a selection of the raw exhaust emissions data as sampled from the vehicles tailpipe (TP in graph key). This data does not take into account the background lab emissions and hence is not an absolute record of the vehicle test, but does give an indication as to the trends of the vehicle pollutants as the tests were conducted. The general trend that we saw in the emissions results can be seen in these graphs and further reinforce the test results as outlined above.

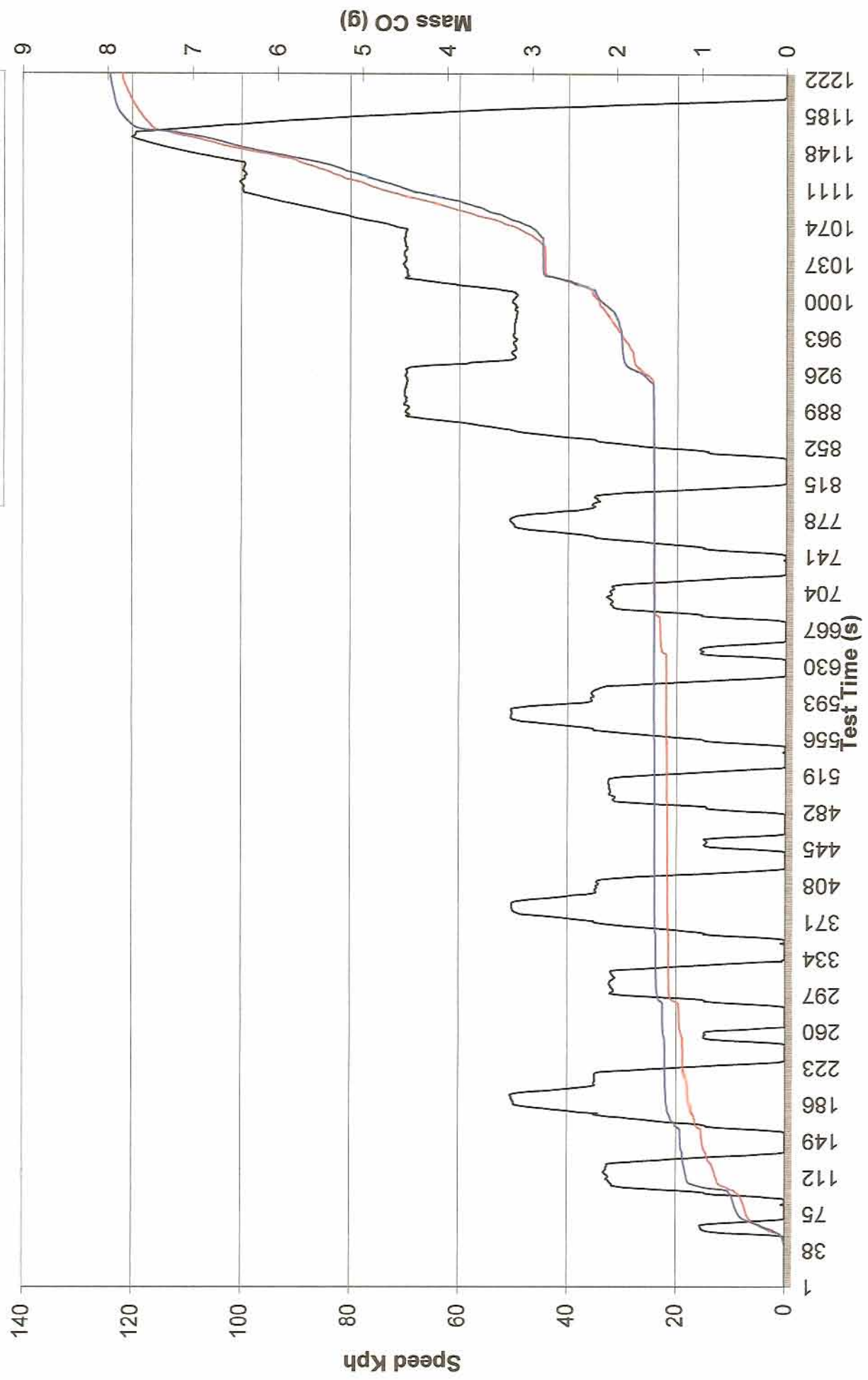
Signed:  _____

Steve Wills MEng, HNC.
Chalgrove, Oxfordshire

Date: 21/05/05

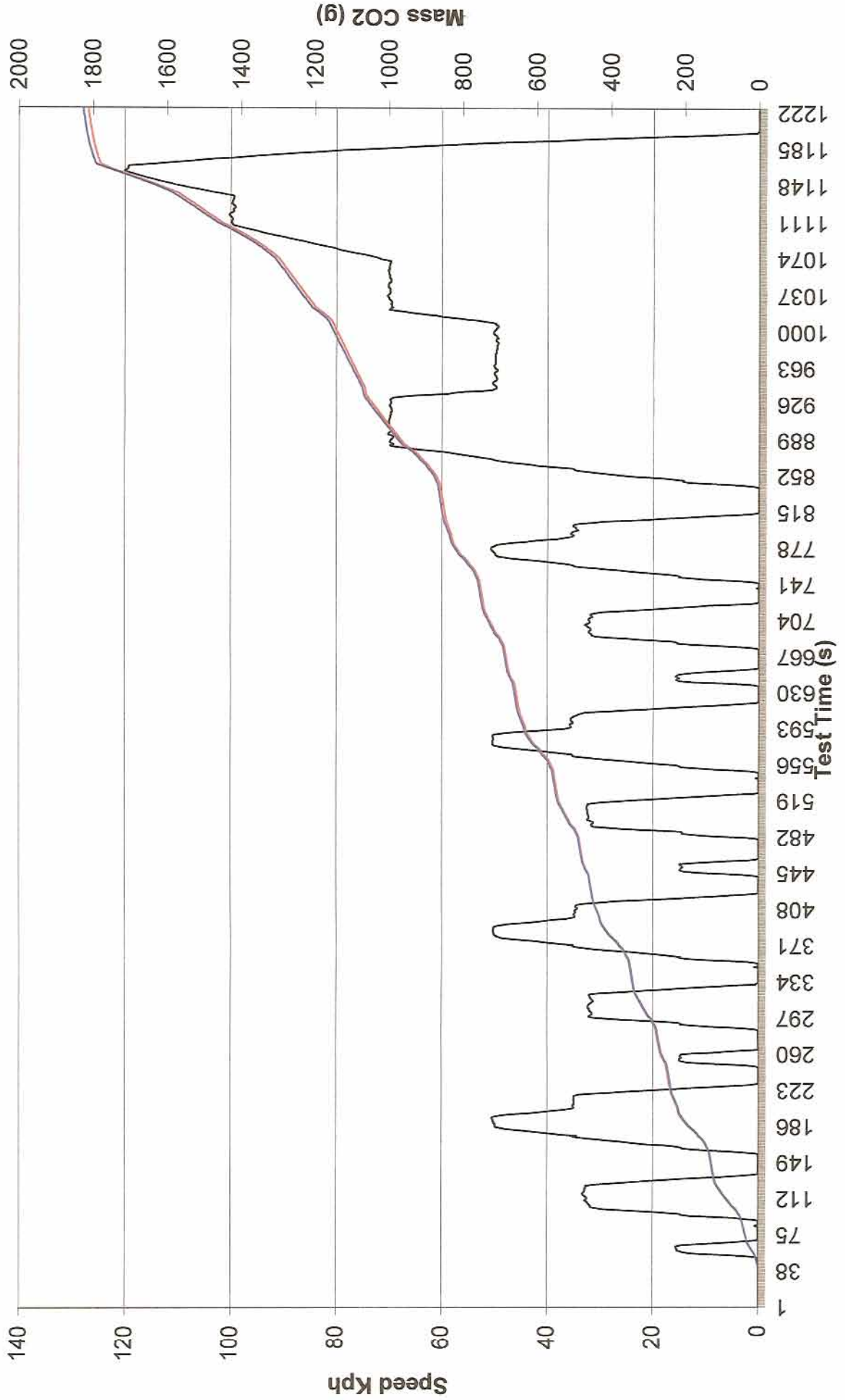
Fiesta Combined Mass CO (g)

- Actual Speed kph
- Accumulated TP CO Standard Test 1
- Accumulated TP CO Ecotek Test 1



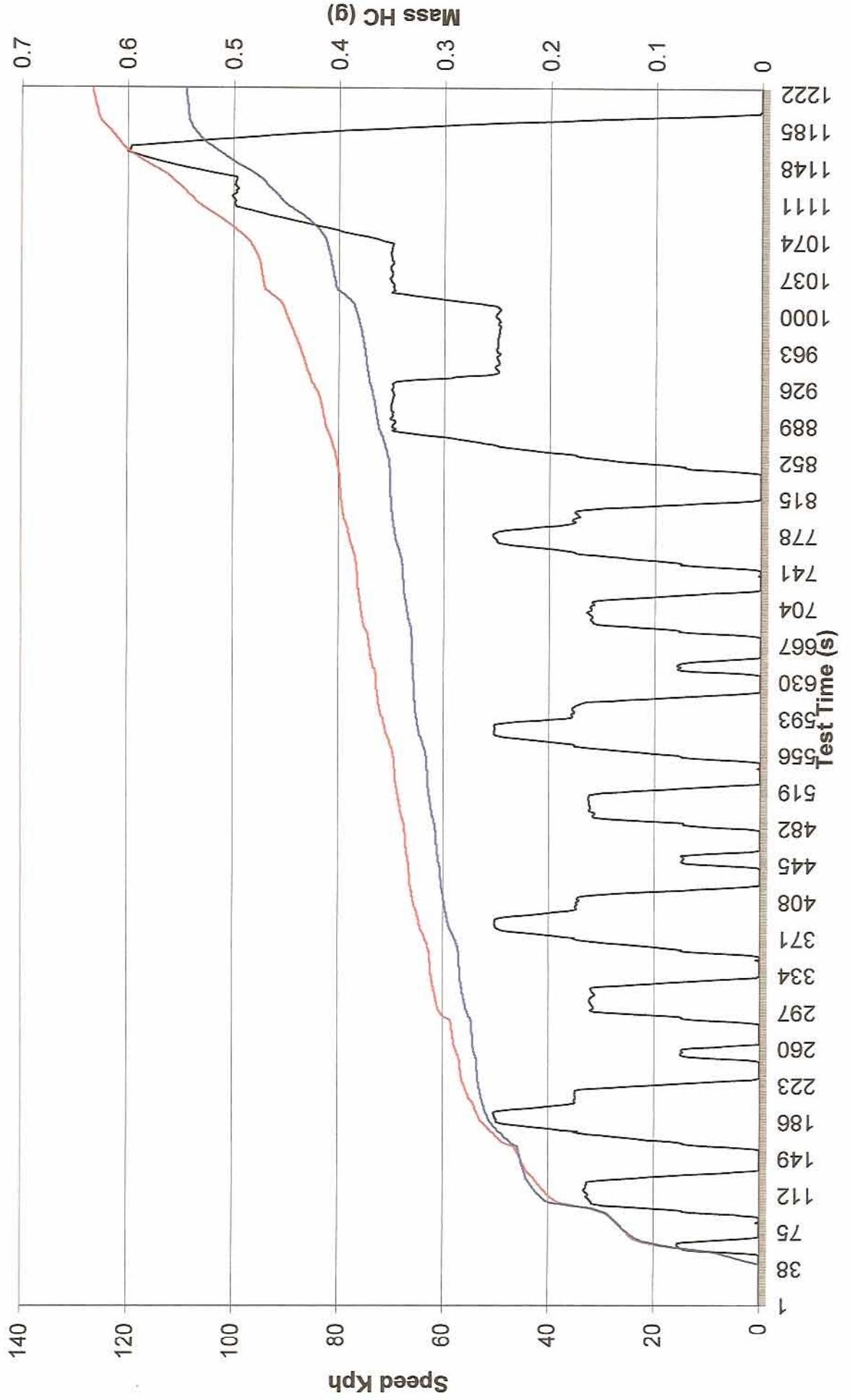
Fiesta Combined Mass CO2 (g)

- Actual Speed kph
- Accumulated TP CO2 Standard Test 1
- Accumulated TP CO2 Ecotek Test 1



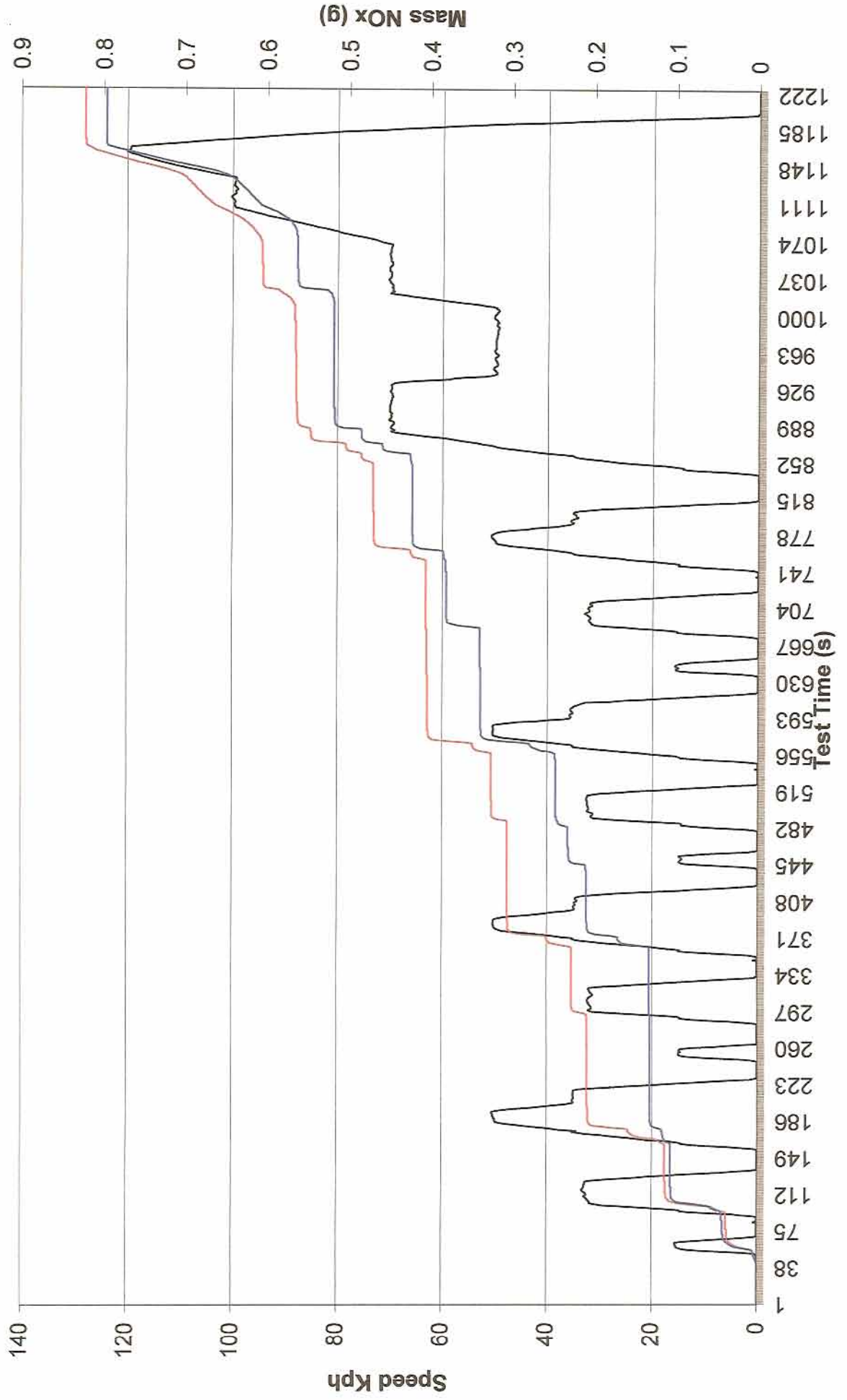
Fiesta Combined Mass HC (g)

- Actual Speed kph
- Accumulated TP THC Standard Test 1
- Accumulated TP THC Ecotek Test 1



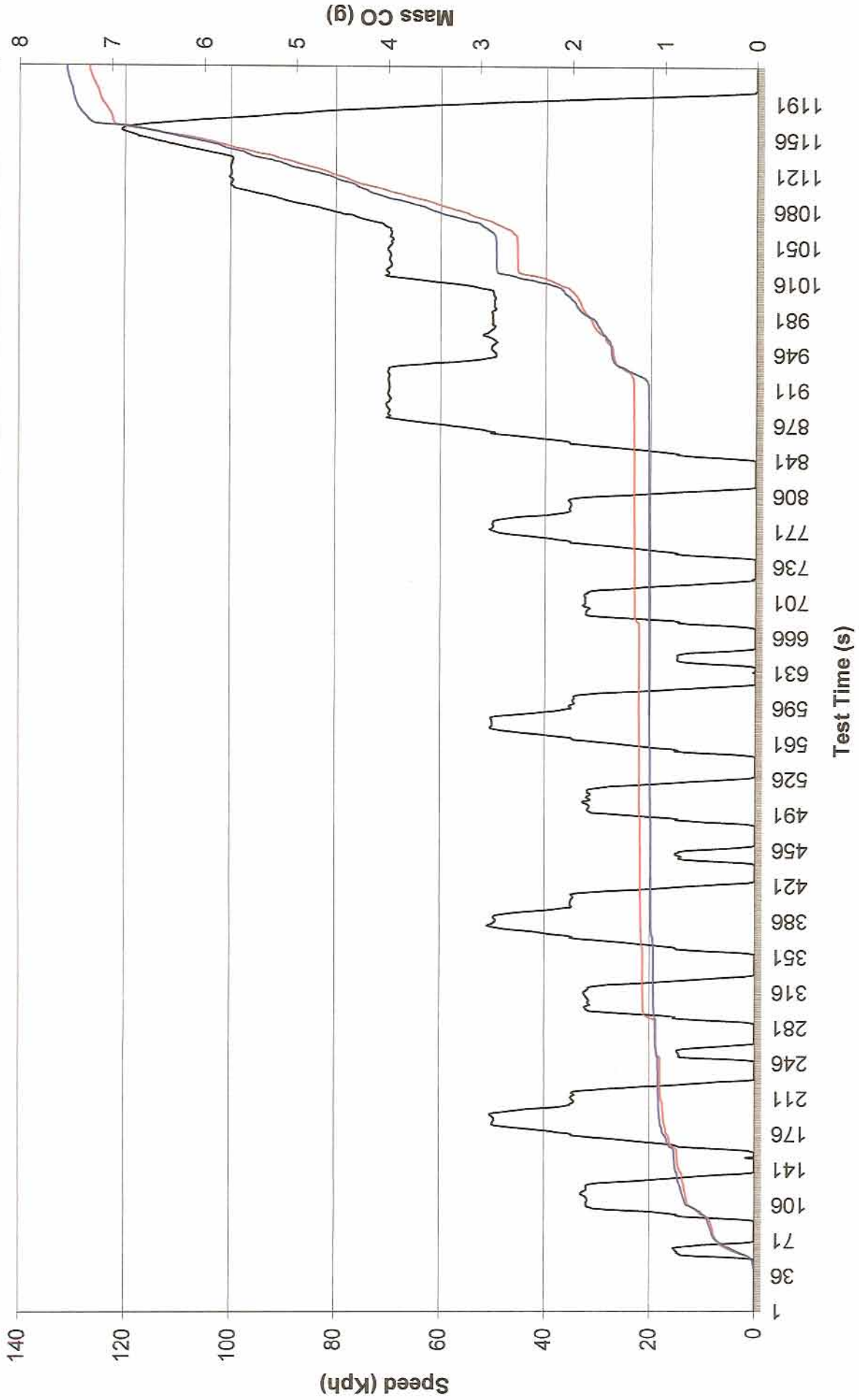
Fiesta Combined Mass NOx (g)

- Actual Speed kph
- Accumulated TP Nox Standard Test 1
- Accumulated TP Nox Ecotek Test 1



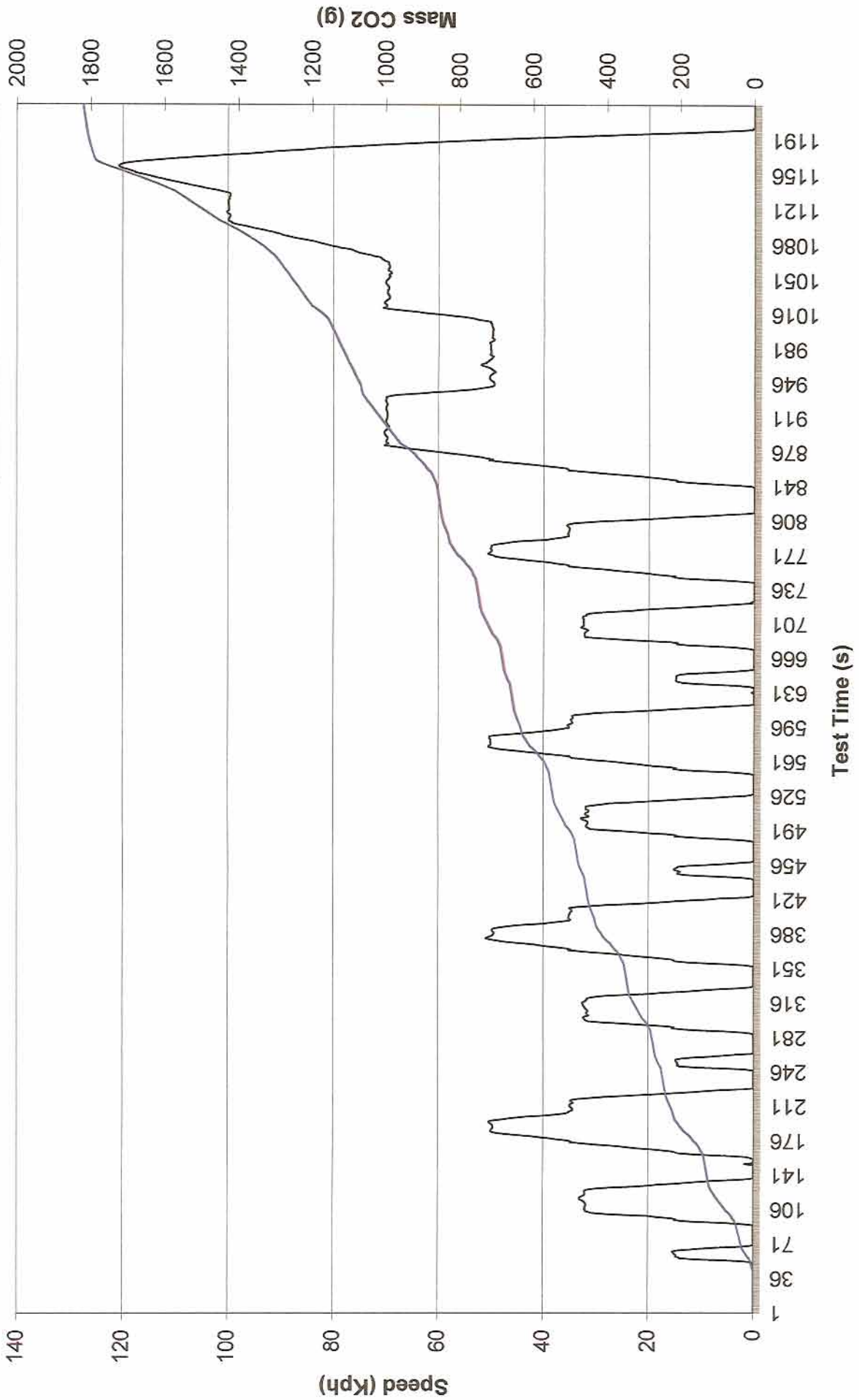
Fiesta Combined Mass CO (g)

- Actual Speed kph
- Accumulated TP CO Standard Test 2
- Accumulated TP CO Ecotek Test 2



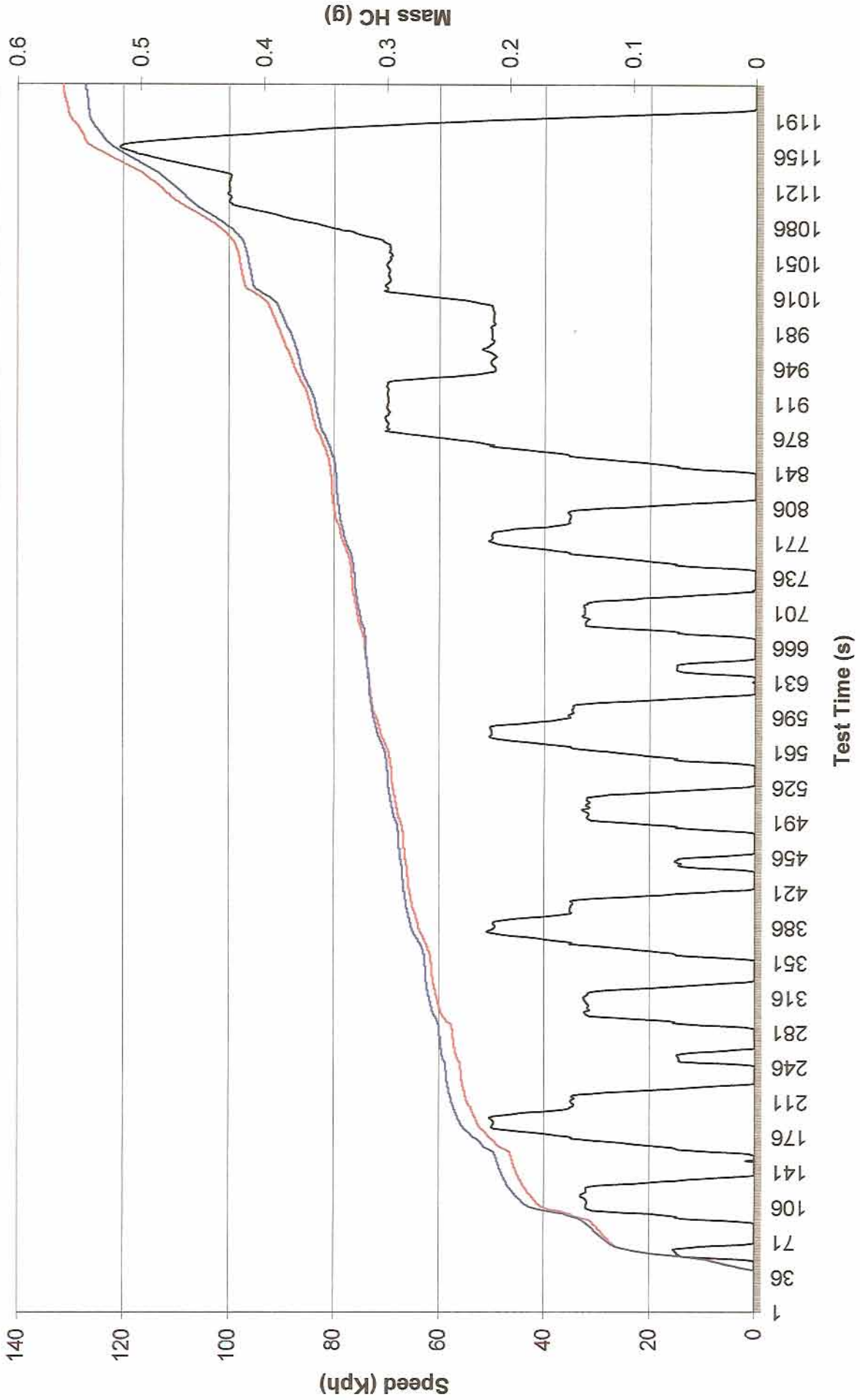
Fiesta Combined Mass CO2 (g)

— Actual Speed kph
— Accumulated TP CO2 Standard Test



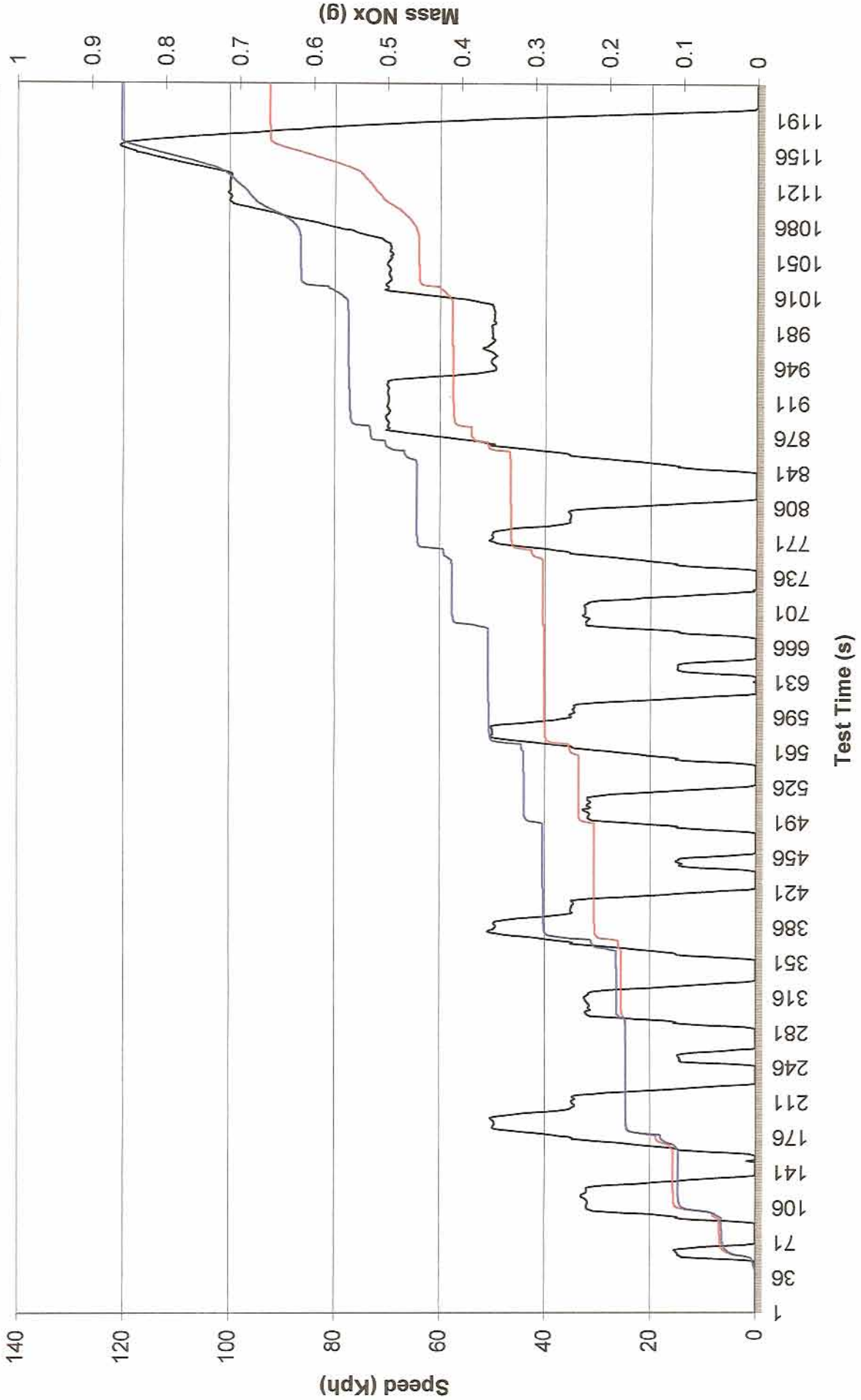
Fiesta Combined Mass HC (g)

- Actual Speed kph
- Accumulated TP THC Standard Test 2
- Accumulated TP THC Ecotek Test 2



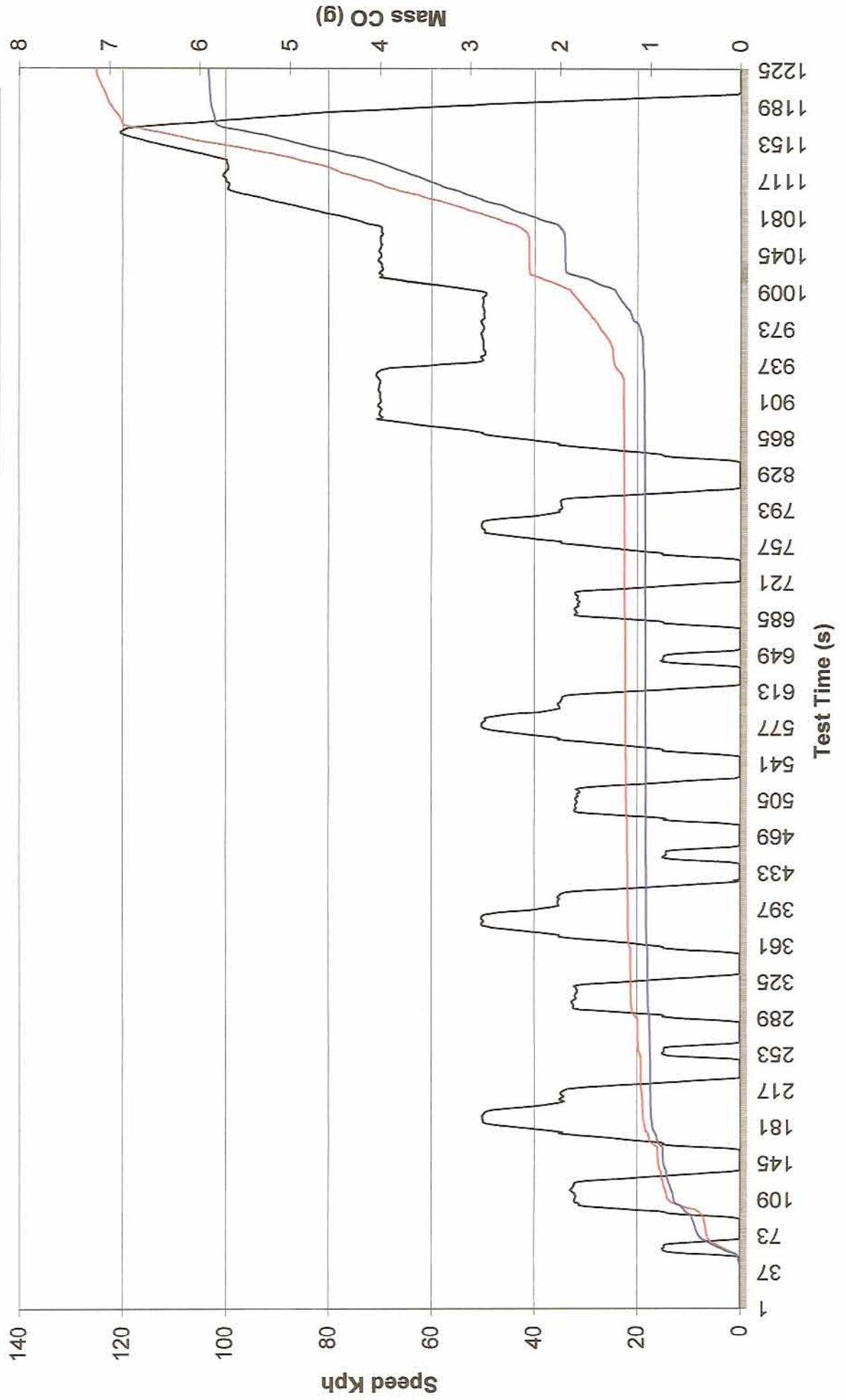
Fiesta Combined Mass NOx (g)

- Actual Speed kph
- Accumulated TP Nox Standard Test 2
- Accumulated TP Nox Ecotek Test 2



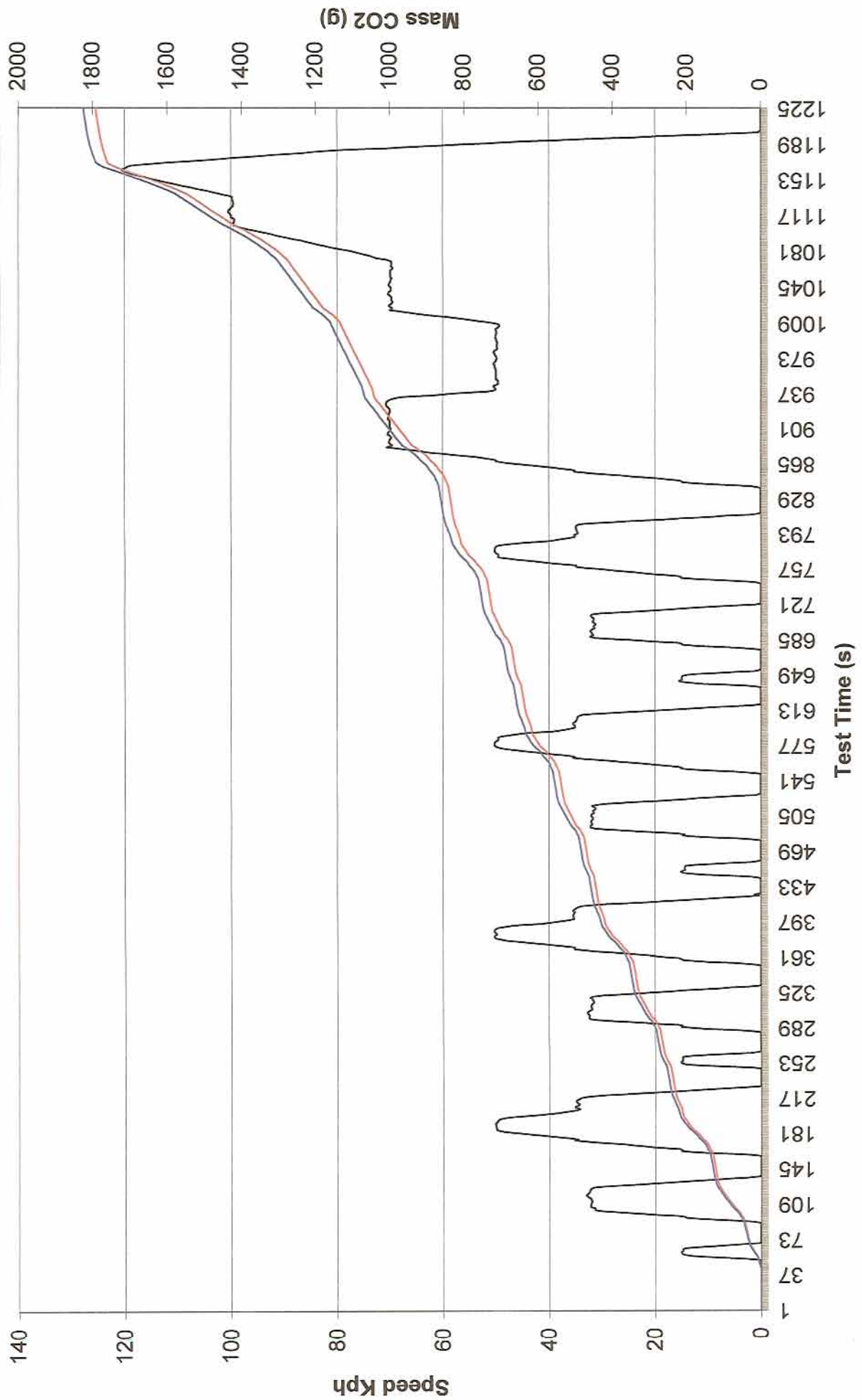
Fiesta Combined Mass CO (g)

- Actual Speed kph
- Accumulated TP CO Standard Test 3
- Accumulated TP CO Ecotek Test 3



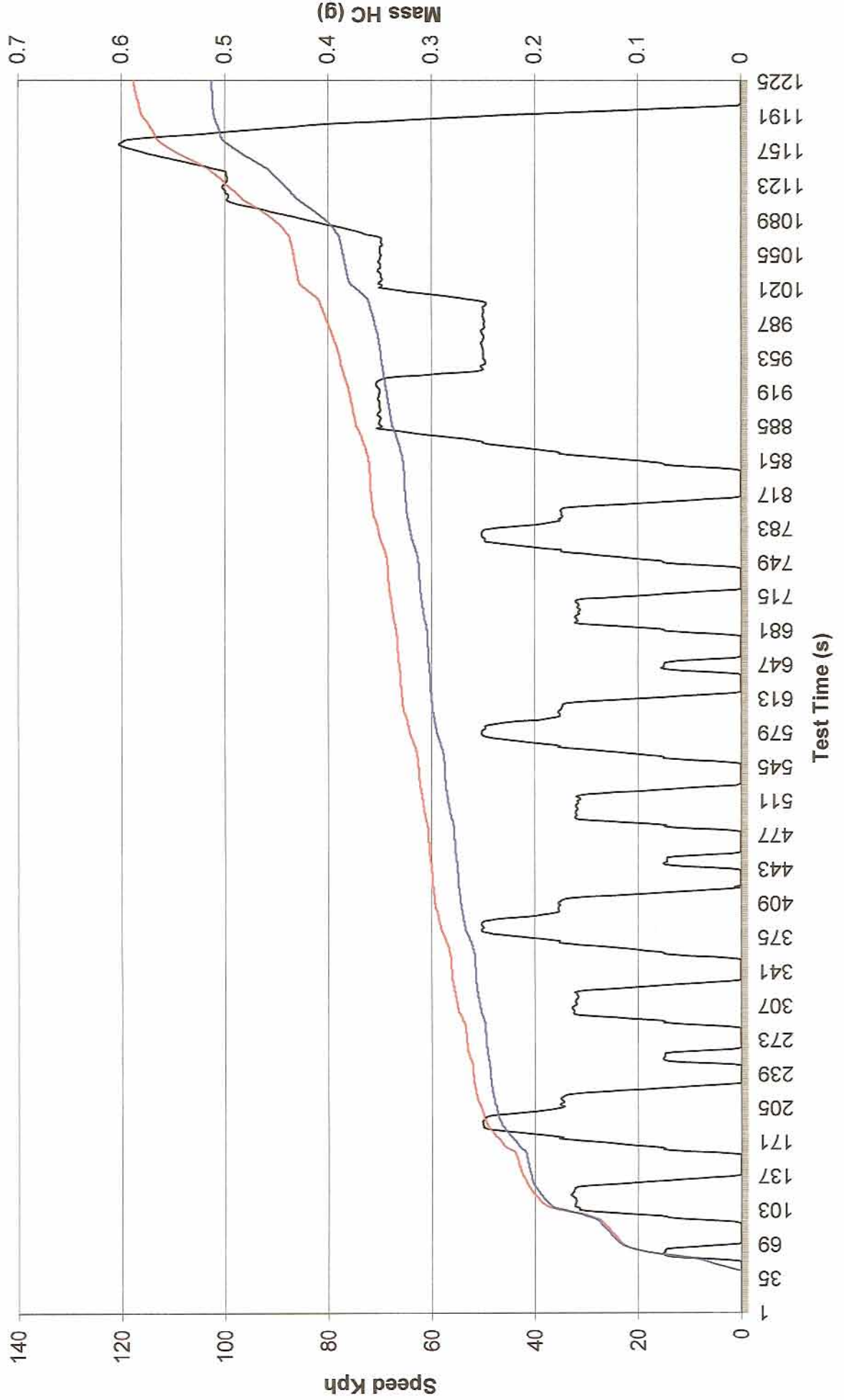
Fiesta Combined Mass CO2 (g)

- Actual Speed kph
- Accumulated TP CO2 Standard Test 3
- Accumulated TP CO2 Ecotek Test 3



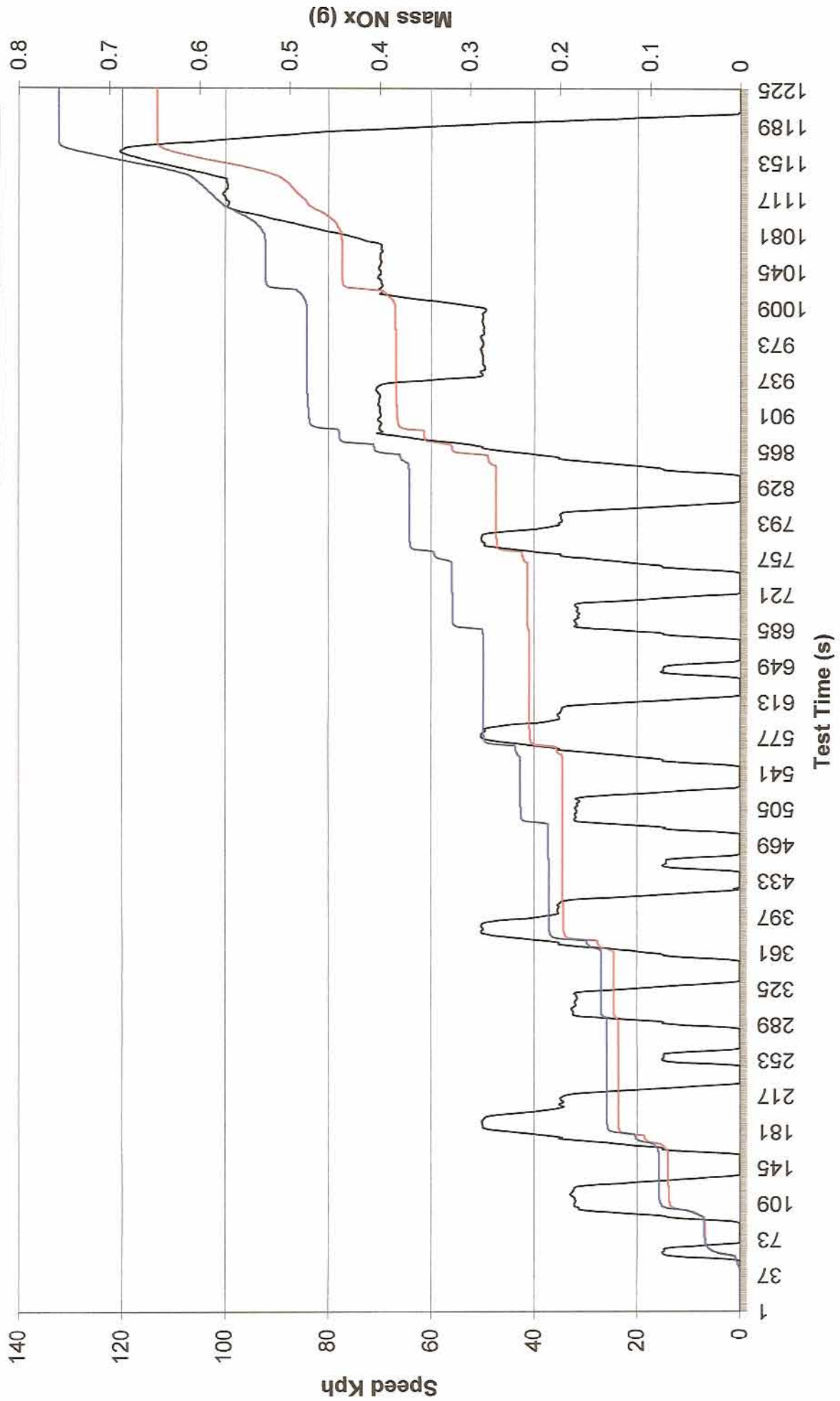
Fiesta Combined Mass HC (g)

- Actual Speed kph
- Accumulated TP THC Standard Test 3
- Accumulated TP THC Ecotek Test 3



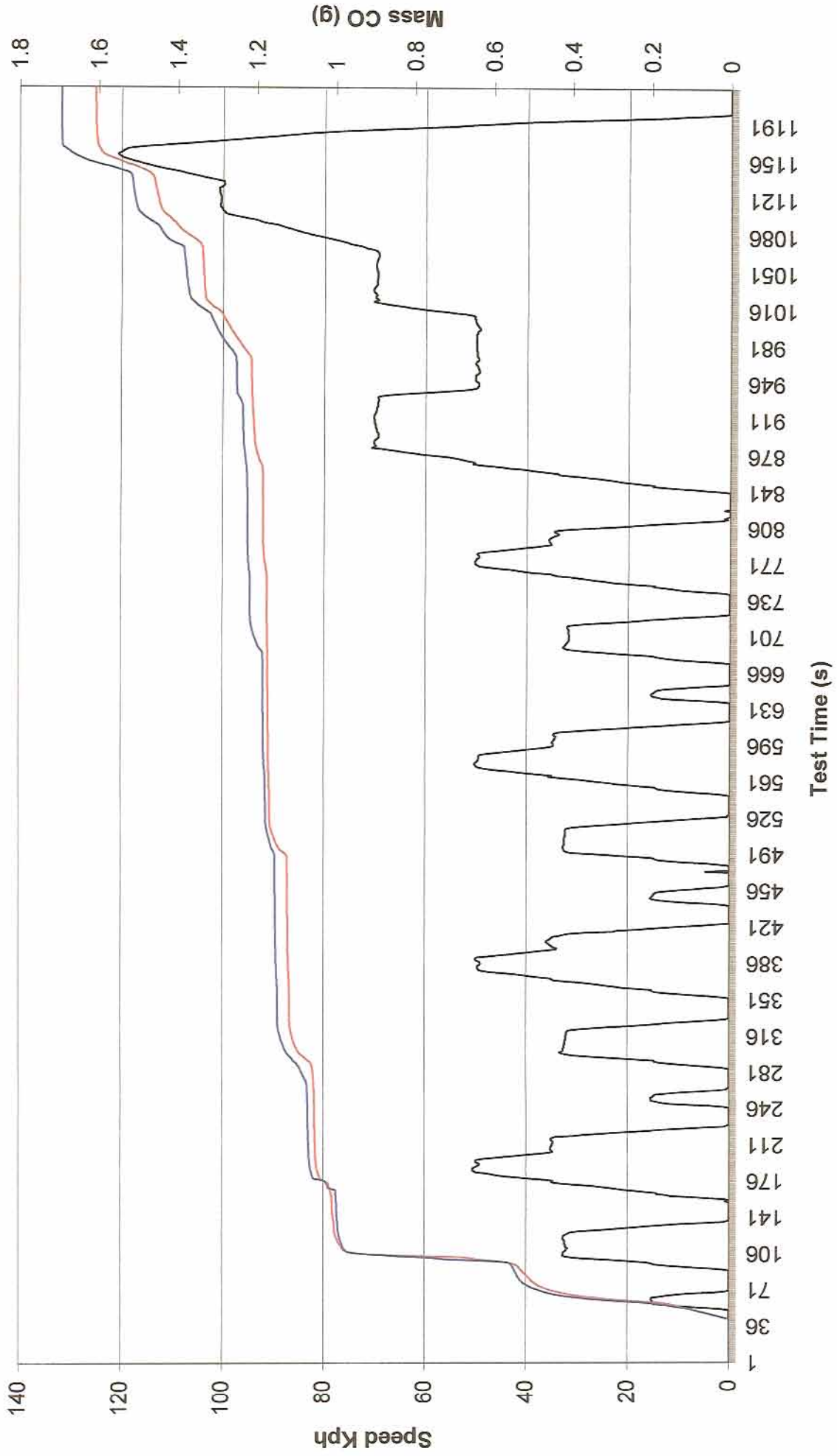
Fiesta Combined Mass NOx (g)

- Actual Speed kph
- Accumulated TP Nox Standar Test 3
- Accumulated TP Nox Ecotec Test 3



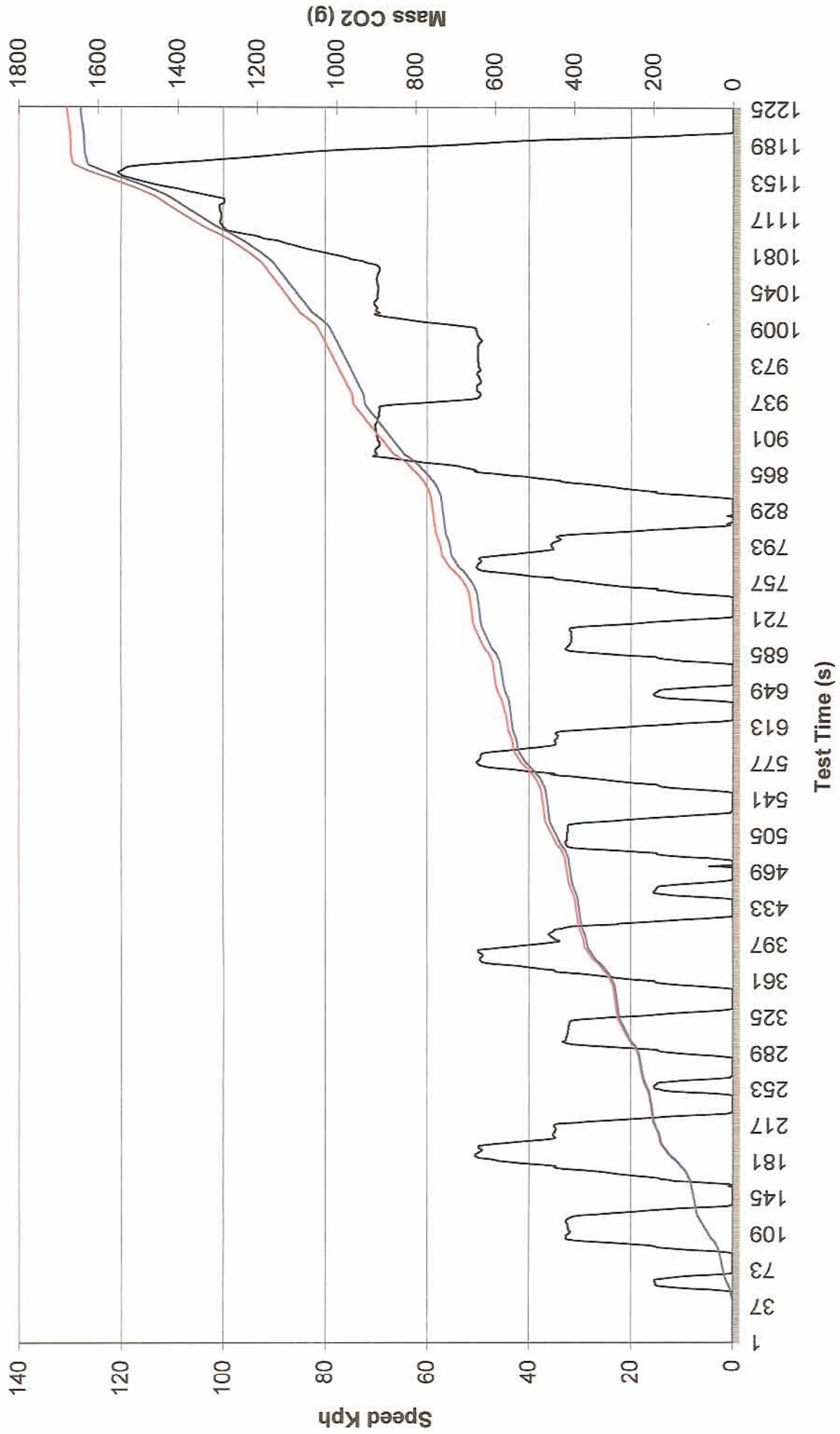
Peugeot Combined Mass CO Test 1

- Actual Speed kph
- Accumulated TP CO Standard Test 1
- Accumulated TP CO Ecotek Test 1



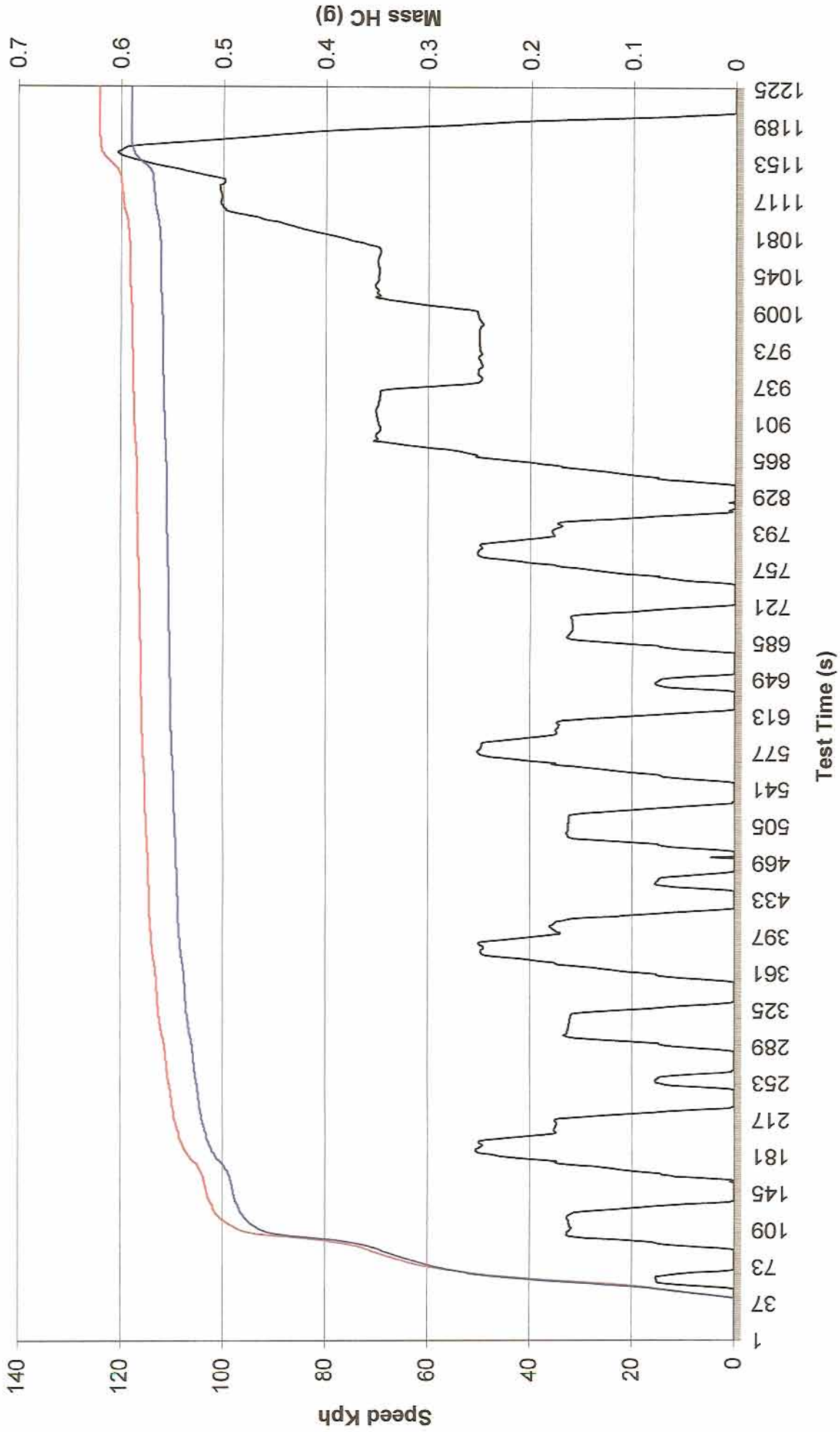
Peugeot Combined Mass CO2 Test 1

- Actual Speed kph
- Accumulated TP CO2 Standard Test 1
- Accumulated TP CO2 Ecotek Test 1



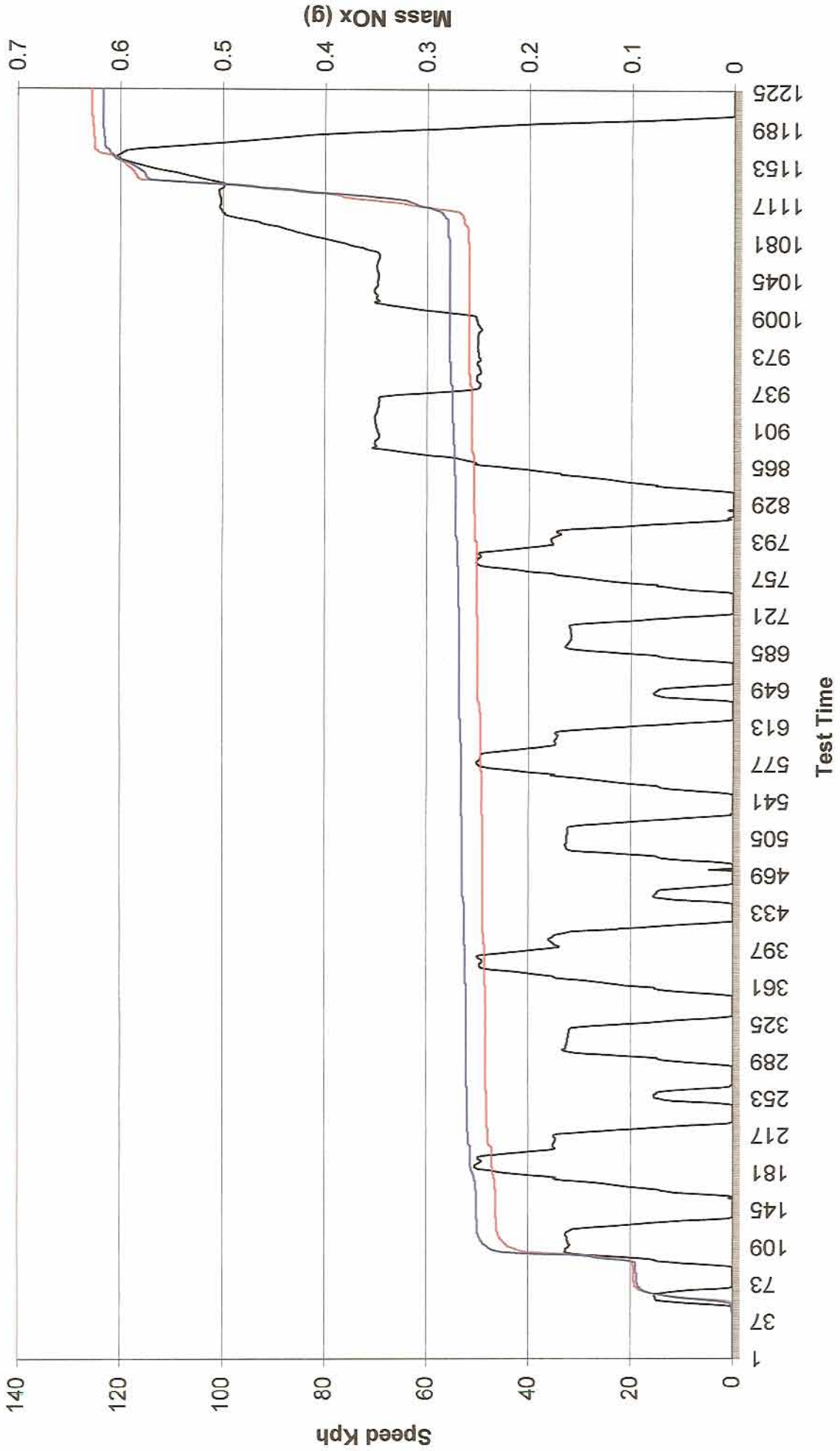
Peugeot Combined Mass HC Test 1

- Actual Speed kph
- Accumulated TP THC Standard Test 1
- Accumulated TP THC Ecotek Test 1



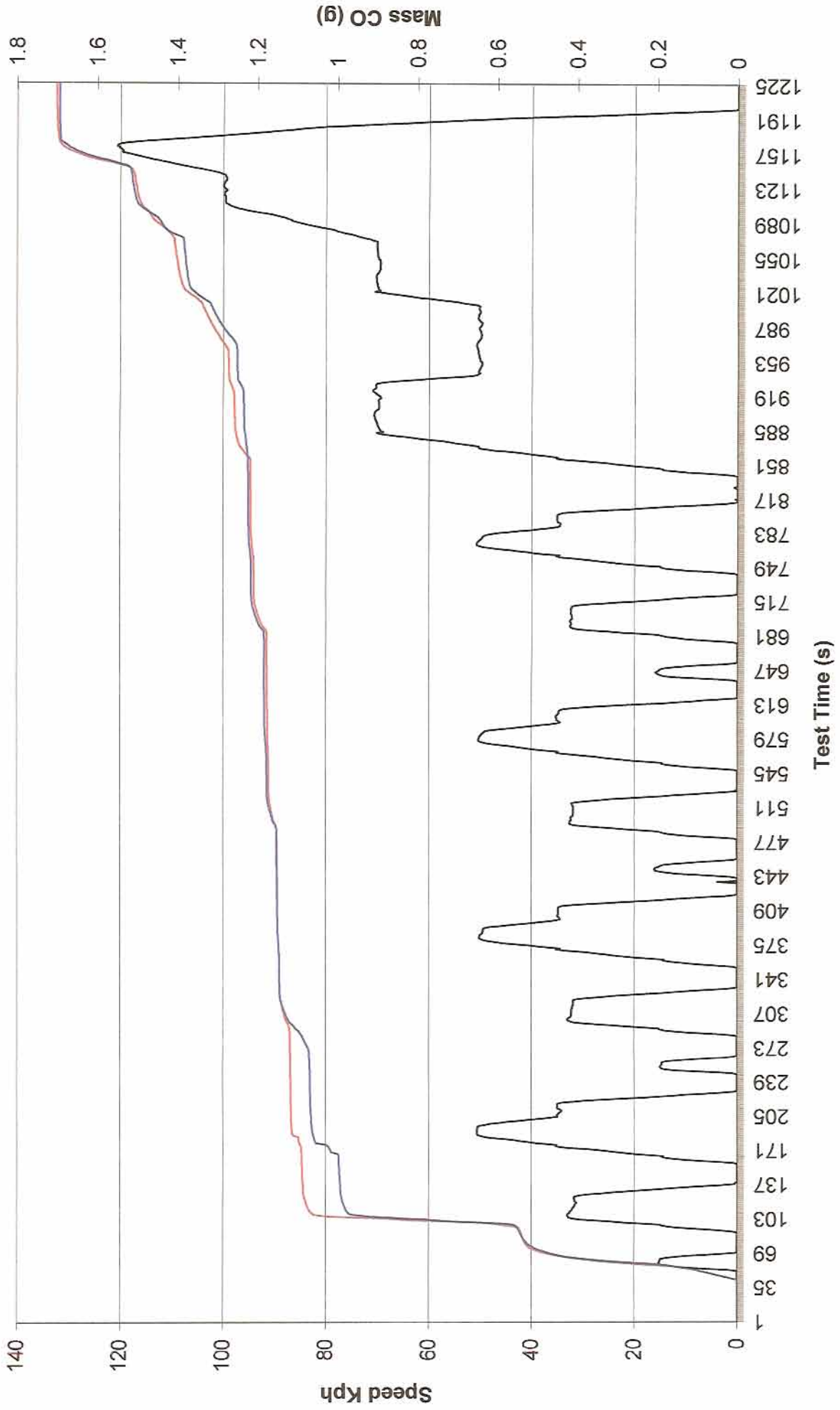
Peugeot Combined Mass NOx Test 1

- Actual Speed kph
- Accumulated TP Nox Standard Test 1
- Accumulated TP Nox Ecotek Test 1



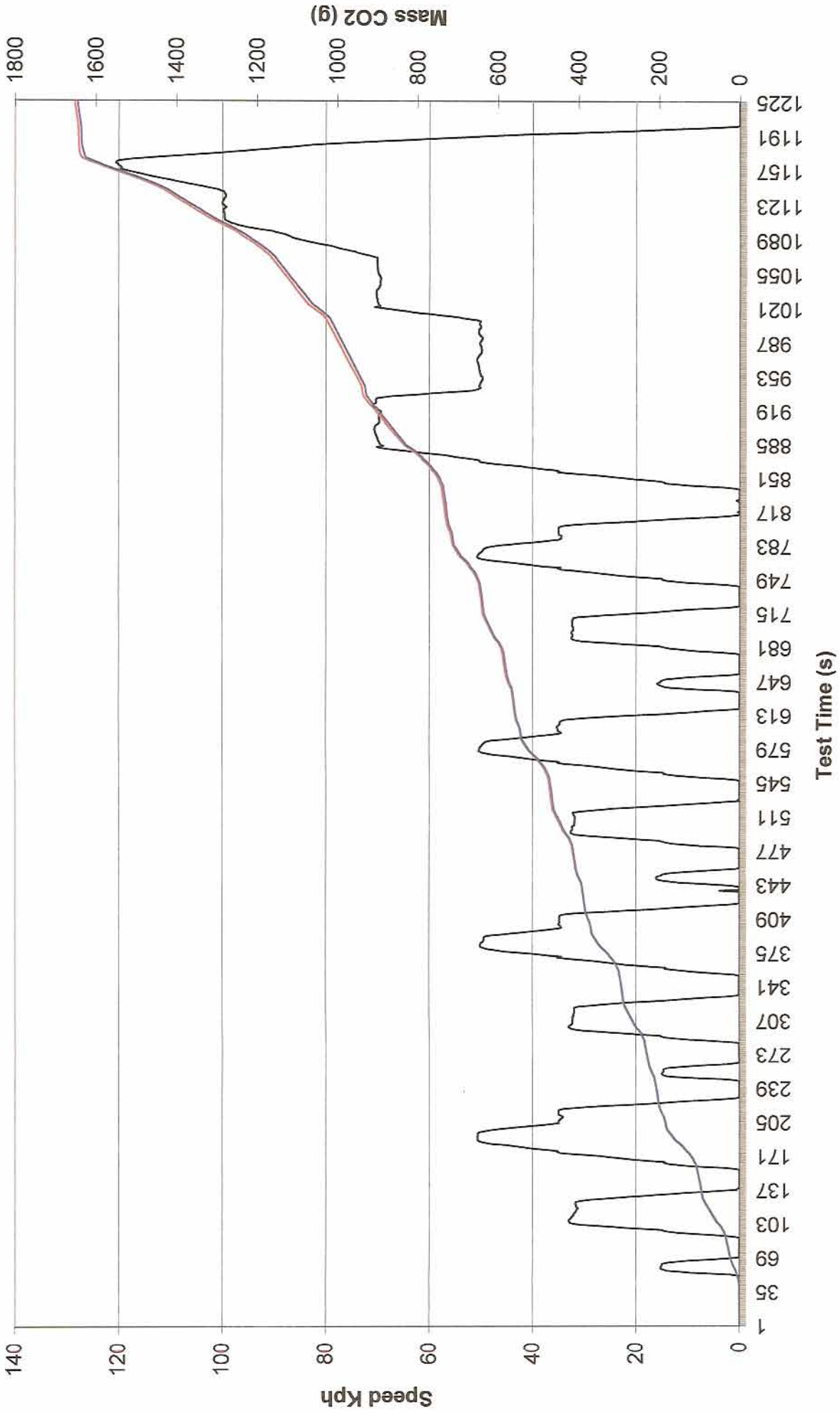
Peugeot Combined Mass CO (g)

- Actual Speed kph
- Accumulated TP CO Standard Test 2
- Accumulated TP CO Ecotek Test 2

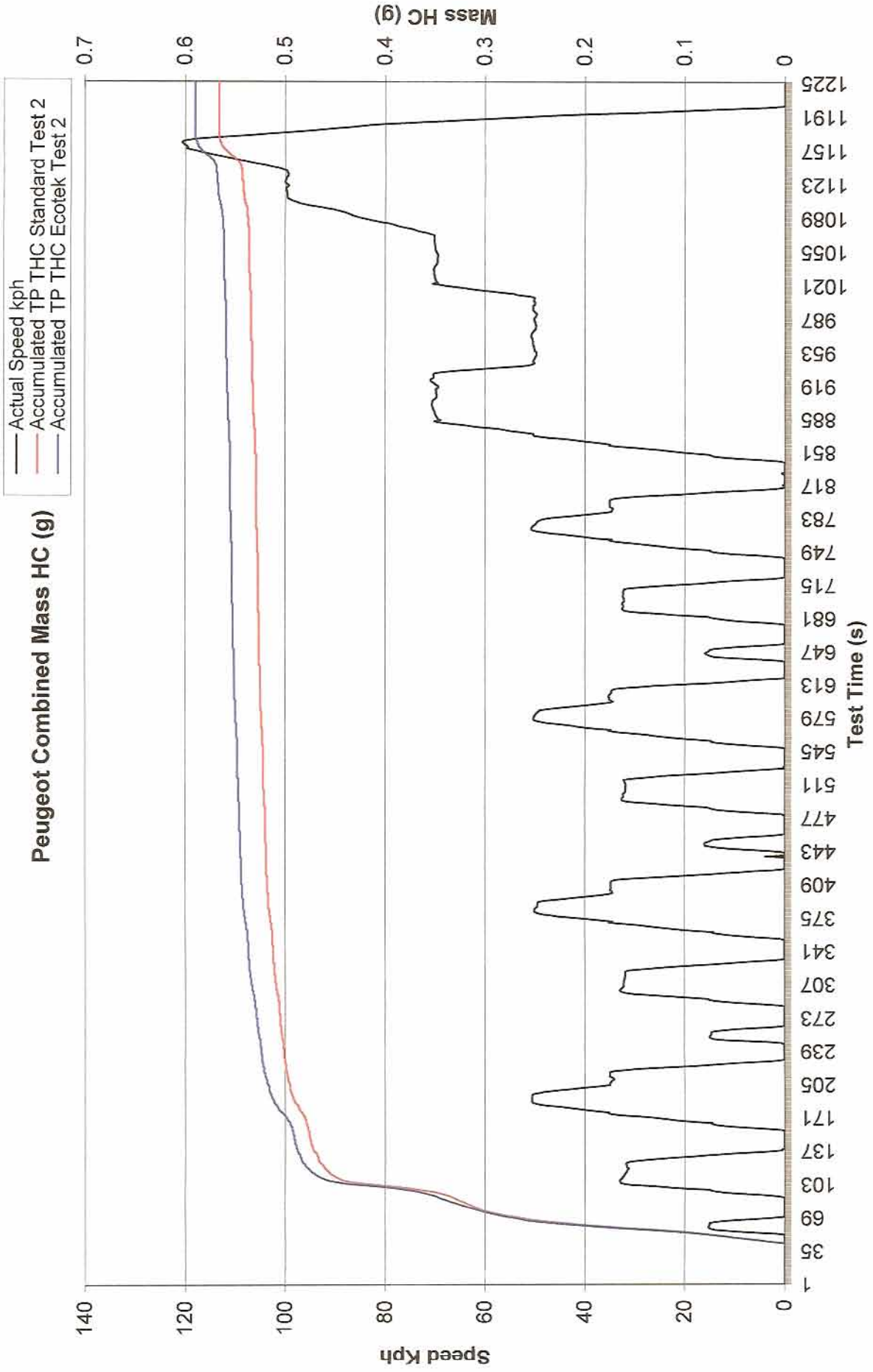


Peugeot Combined Mass CO2 (g)

- Actual Speed kph
- Accumulated TP CO2 Standard Test 2
- Accumulated TP CO2 Ecotek Test 2

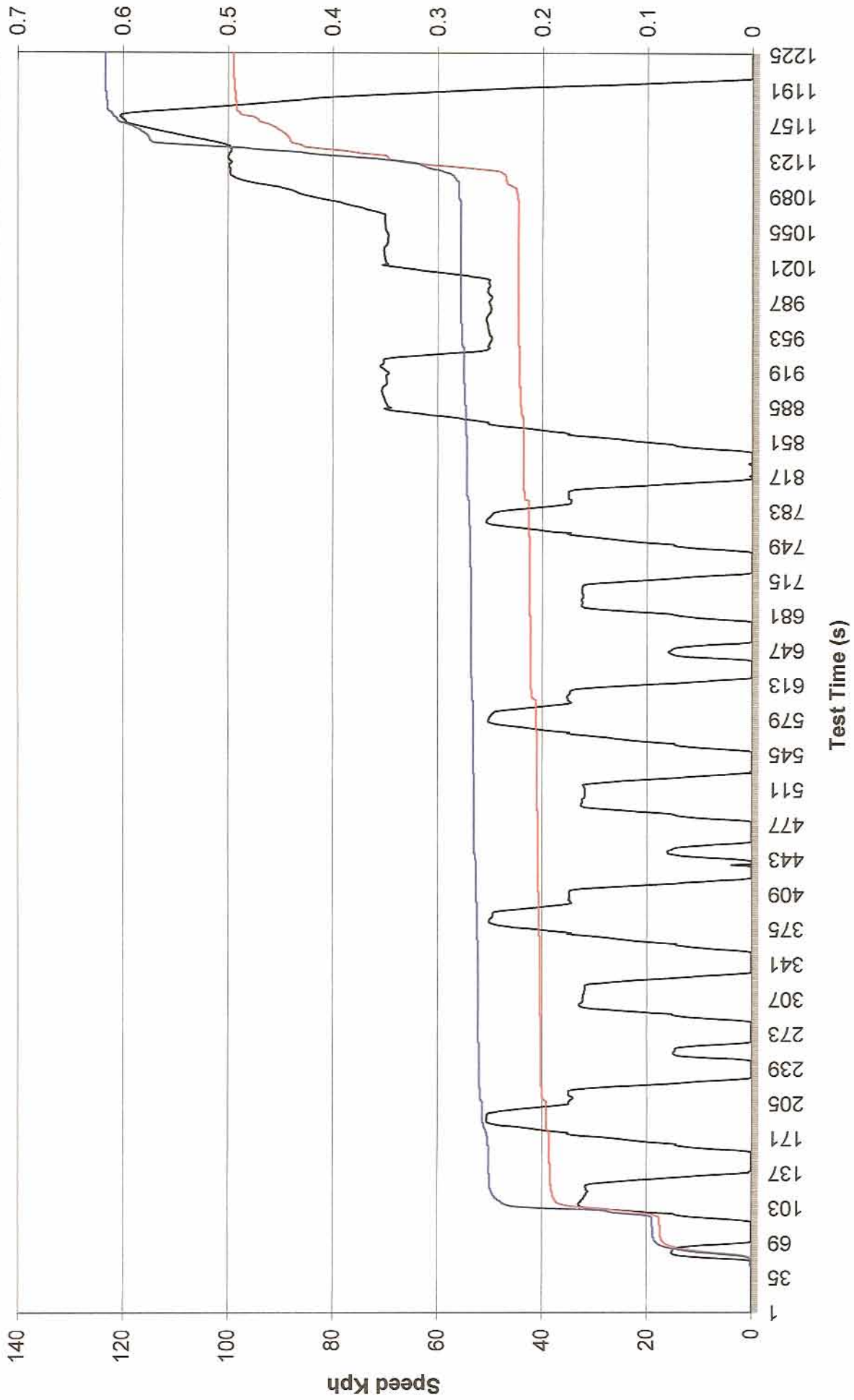


Peugeot Combined Mass HC (g)



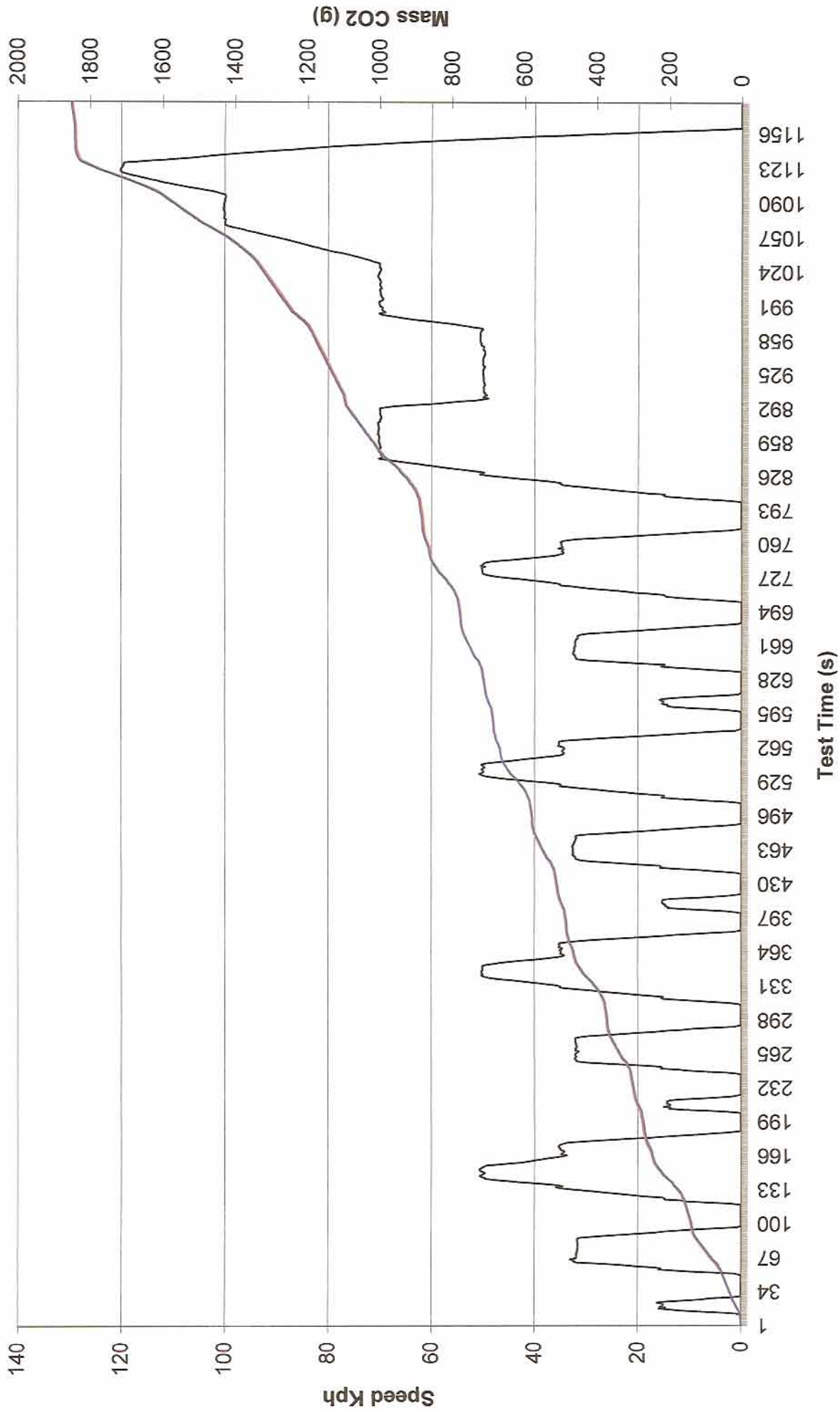
Peugeot Combined Mass NOx (g)

- Actual Speed kph
- Accumulated TP Nox Standard Test 2
- Accumulated TP Nox Ecotek Test 2



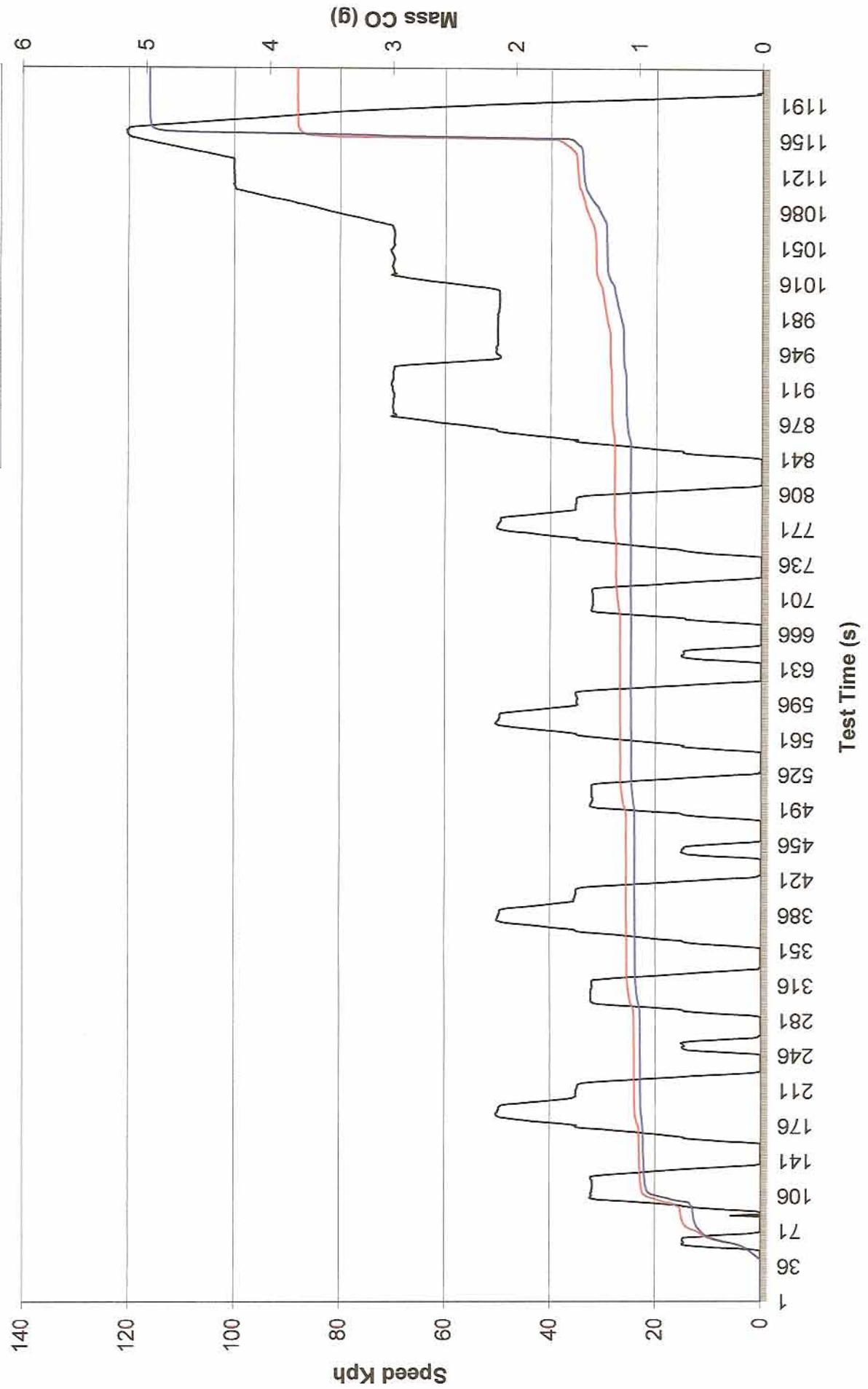
Polo Mass CO2 (g) Test 3

- Actual Speed kph
- Accumulated TP CO2 Standard Test 3
- Accumulated TP CO2 Ecotek Test 3



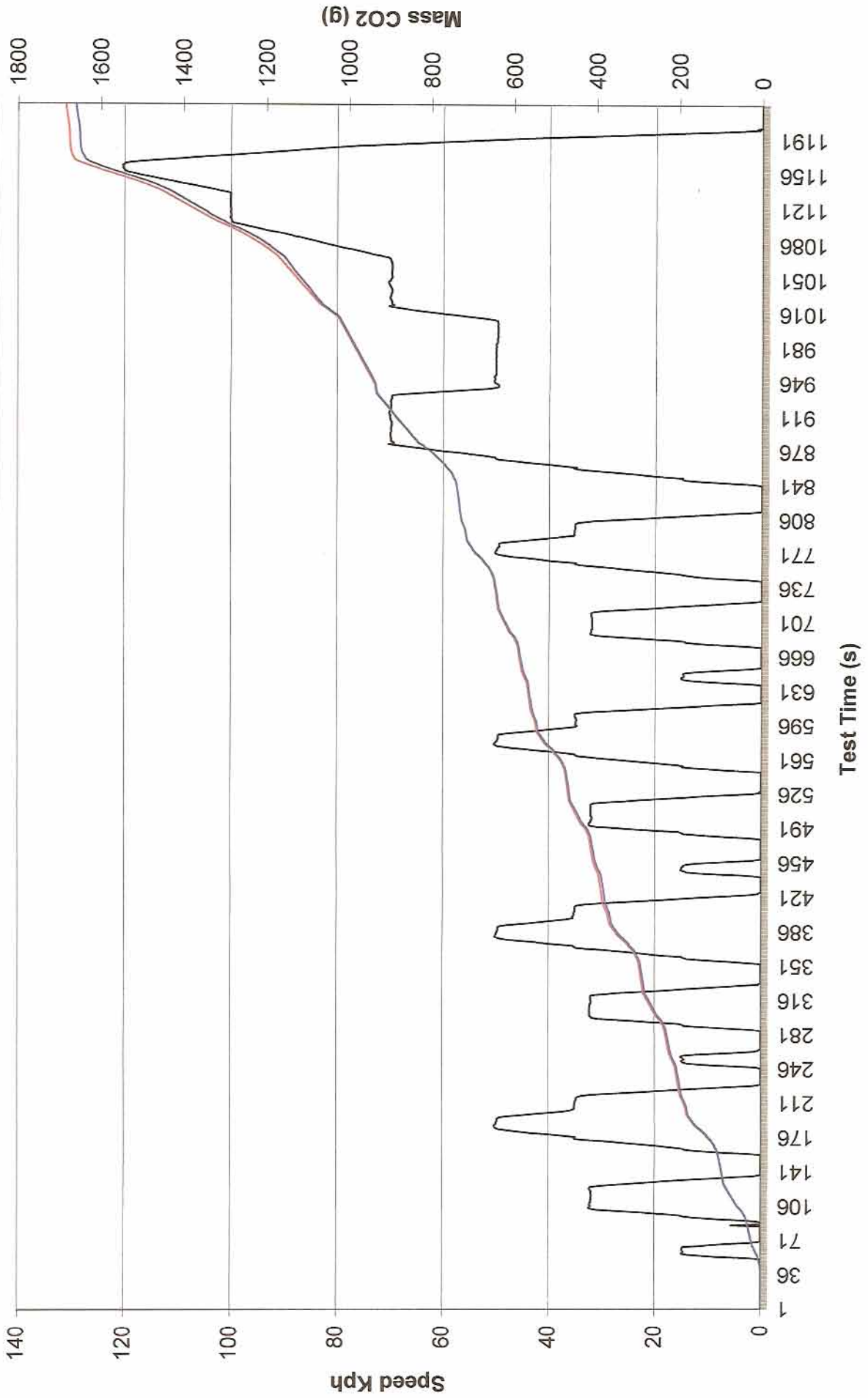
Peugeot Combined Mass CO (g)

- Actual Speed kph
- Accumulated TP CO Standard Test 3
- Accumulated TP CO Ecotek Test 3



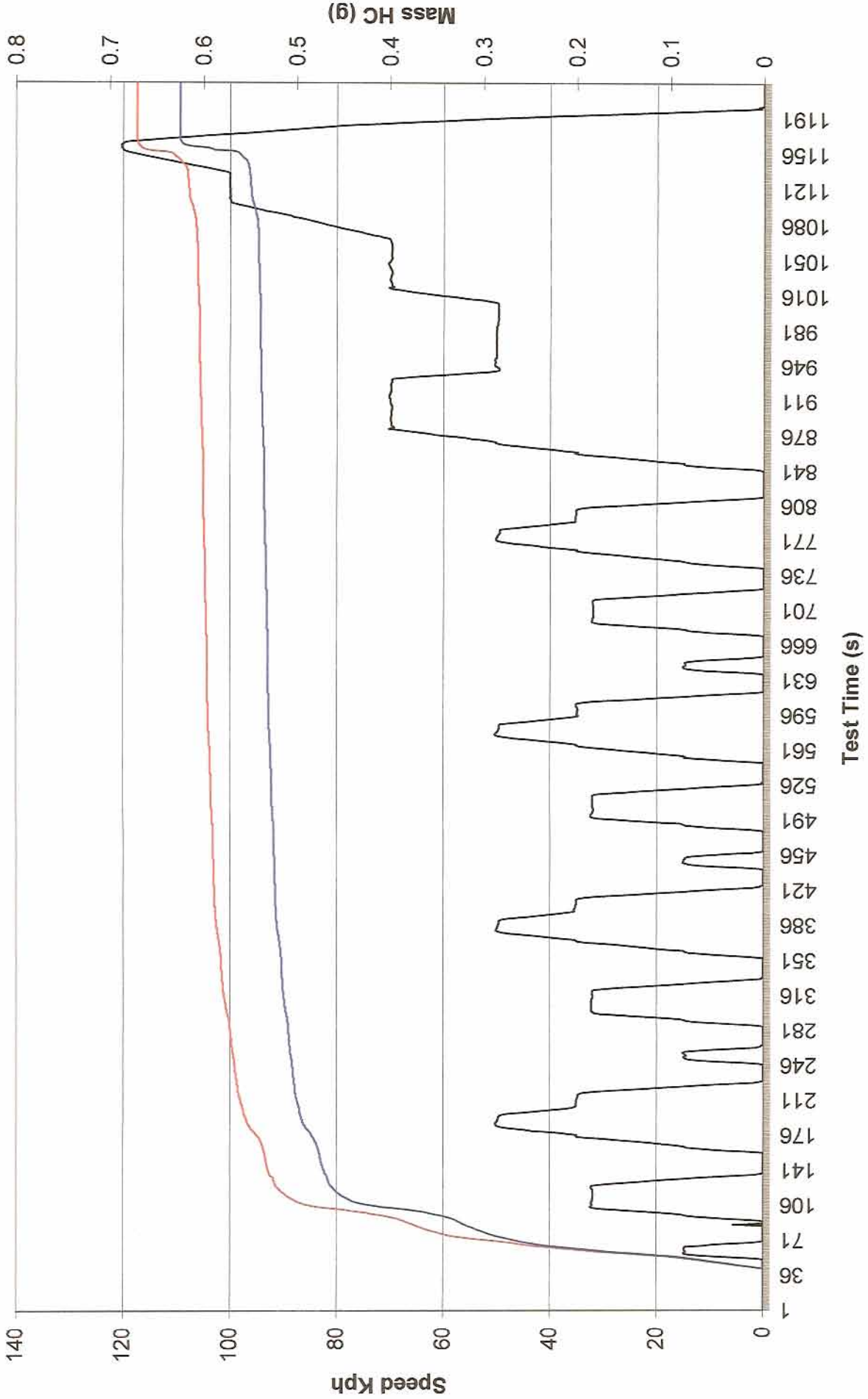
Peugeot Combined Mass CO2 (g)

- Actual Speed kph
- Accumulated TP CO2 Standard Test 3
- Accumulated TP CO2 Ecotek Test 3



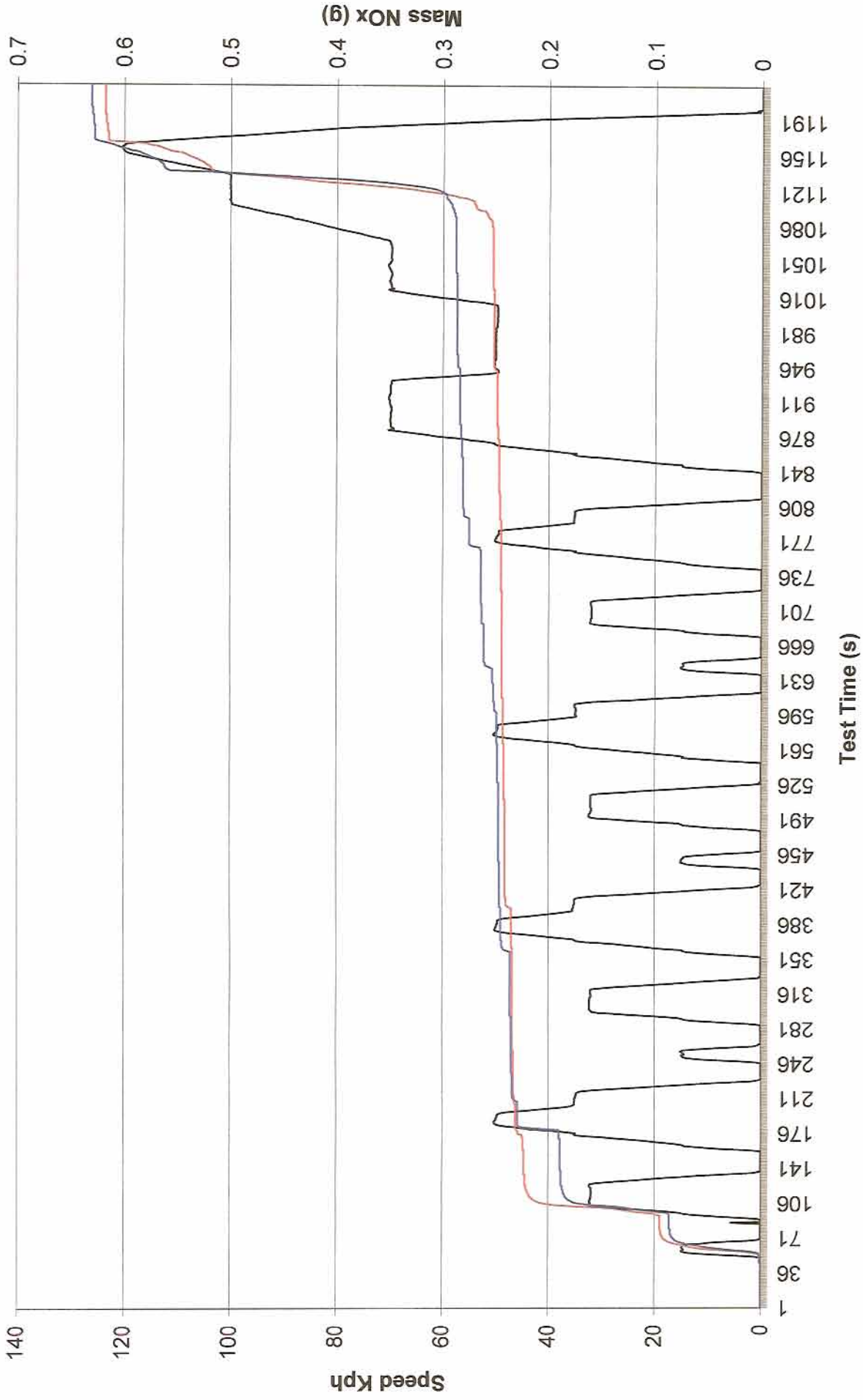
Peugeot Combined Mass HC (g)

- Actual Speed kph
- Accumulated TP THC Standard Test 3
- Accumulated TP THC Ecotek Test 3

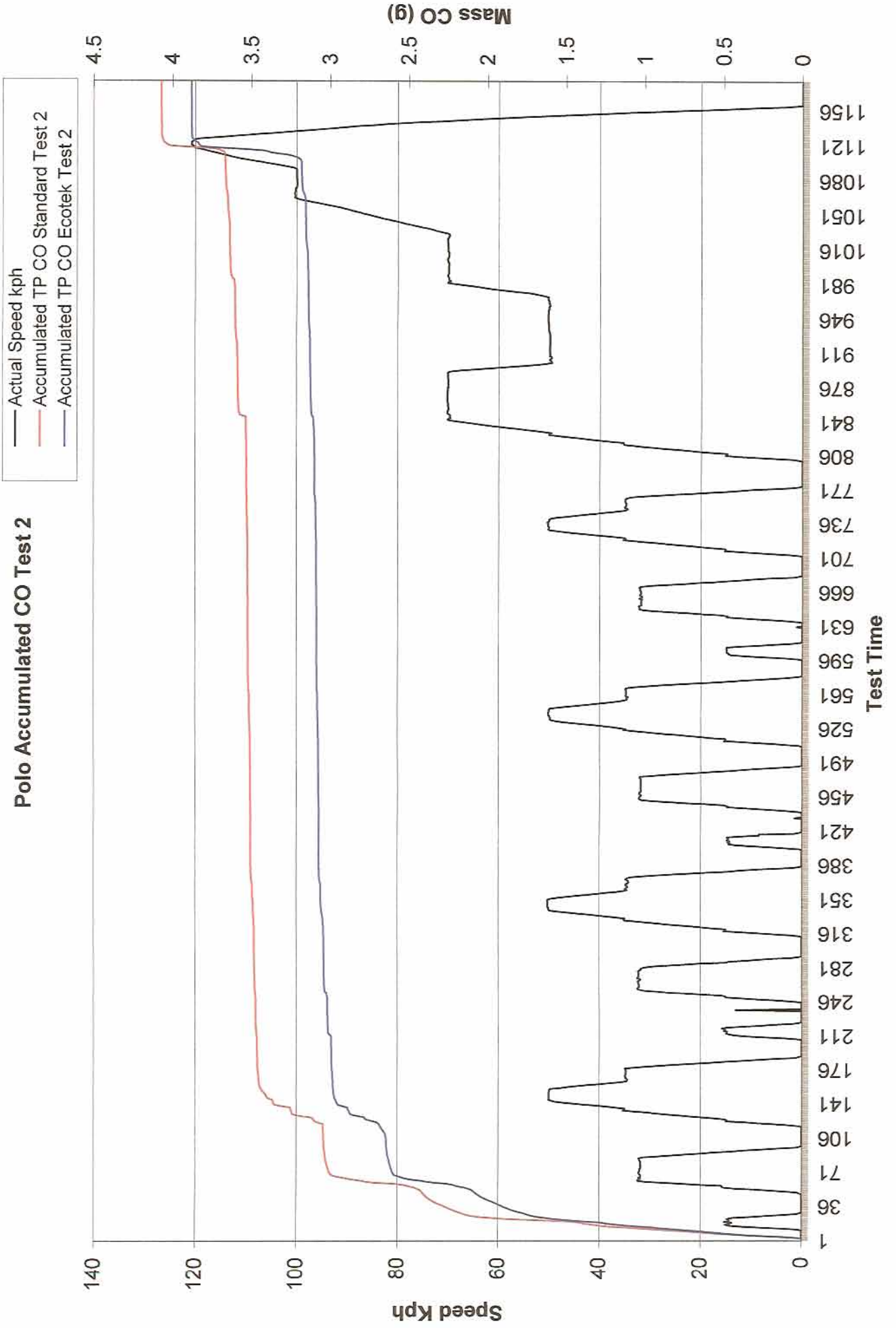


Peugeot Combined Mass NOx (g)

- Actual Speed kph
- Accumulated TP Nox Standard Test 3
- Accumulated TP Nox Ecotek Test 3

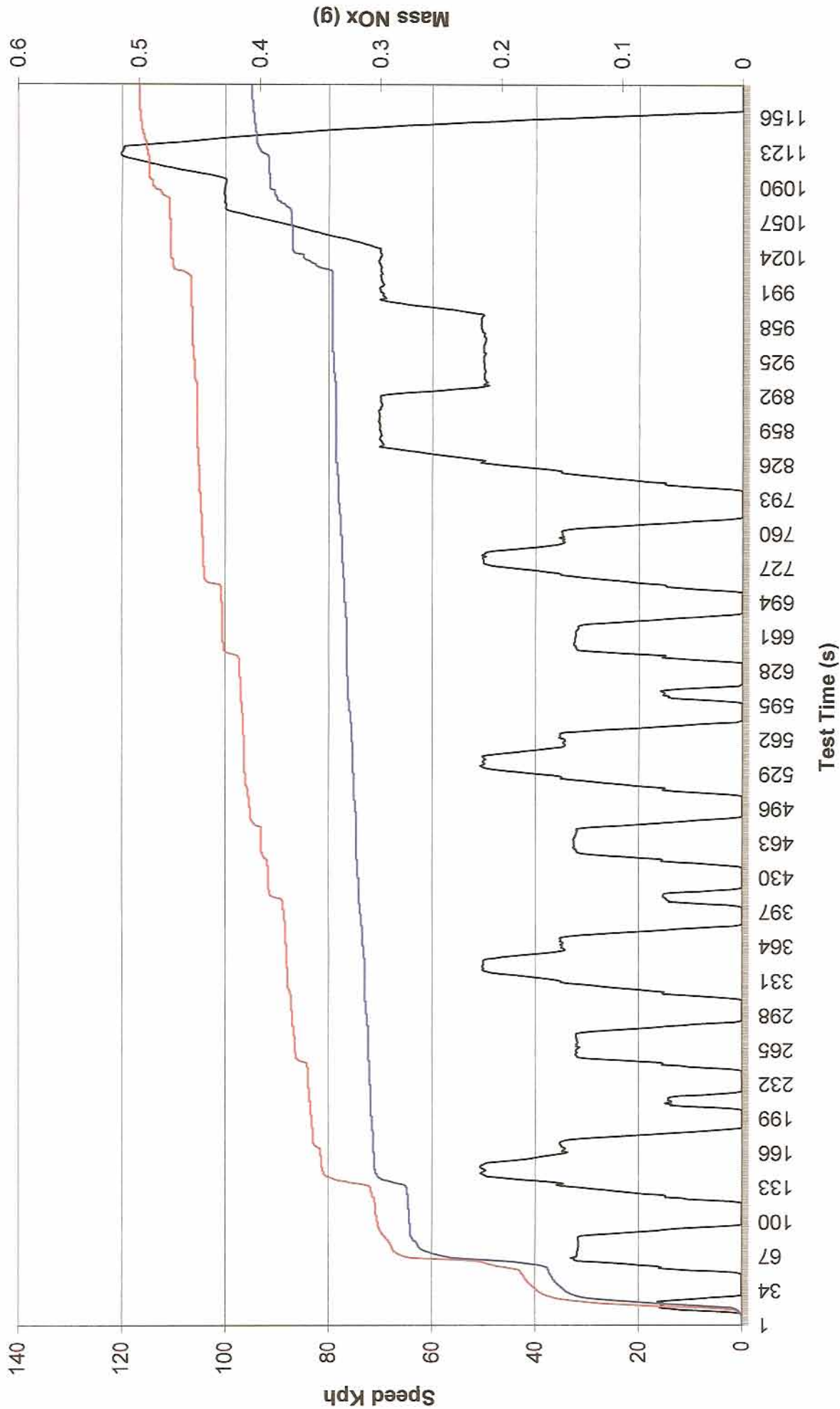


Polo Accumulated CO Test 2



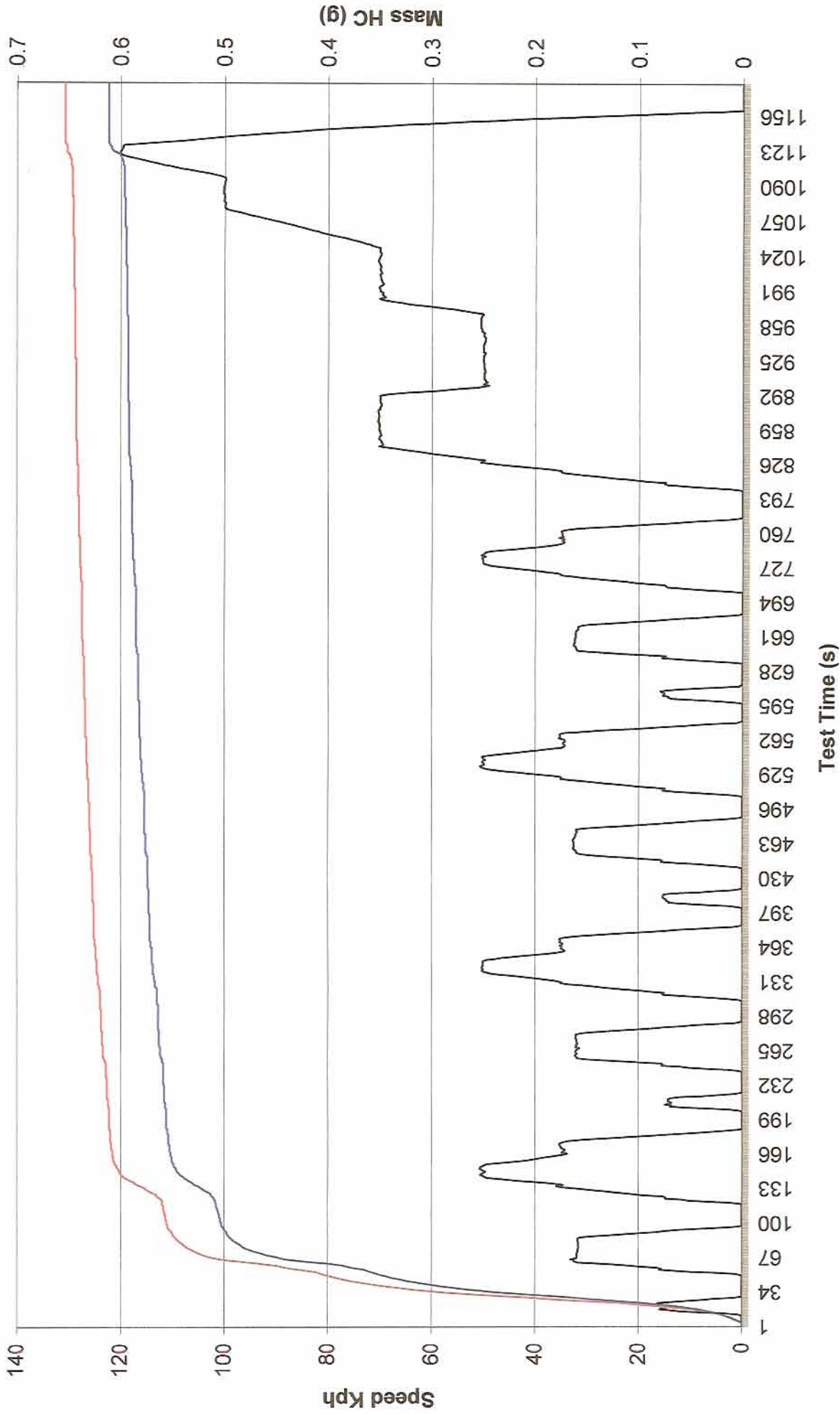
Polo Mass NOx Test 3

- Actual Speed kph
- Accumulated TP Nox Standard Test 3
- Accumulated TP Nox Ecotek Test 3



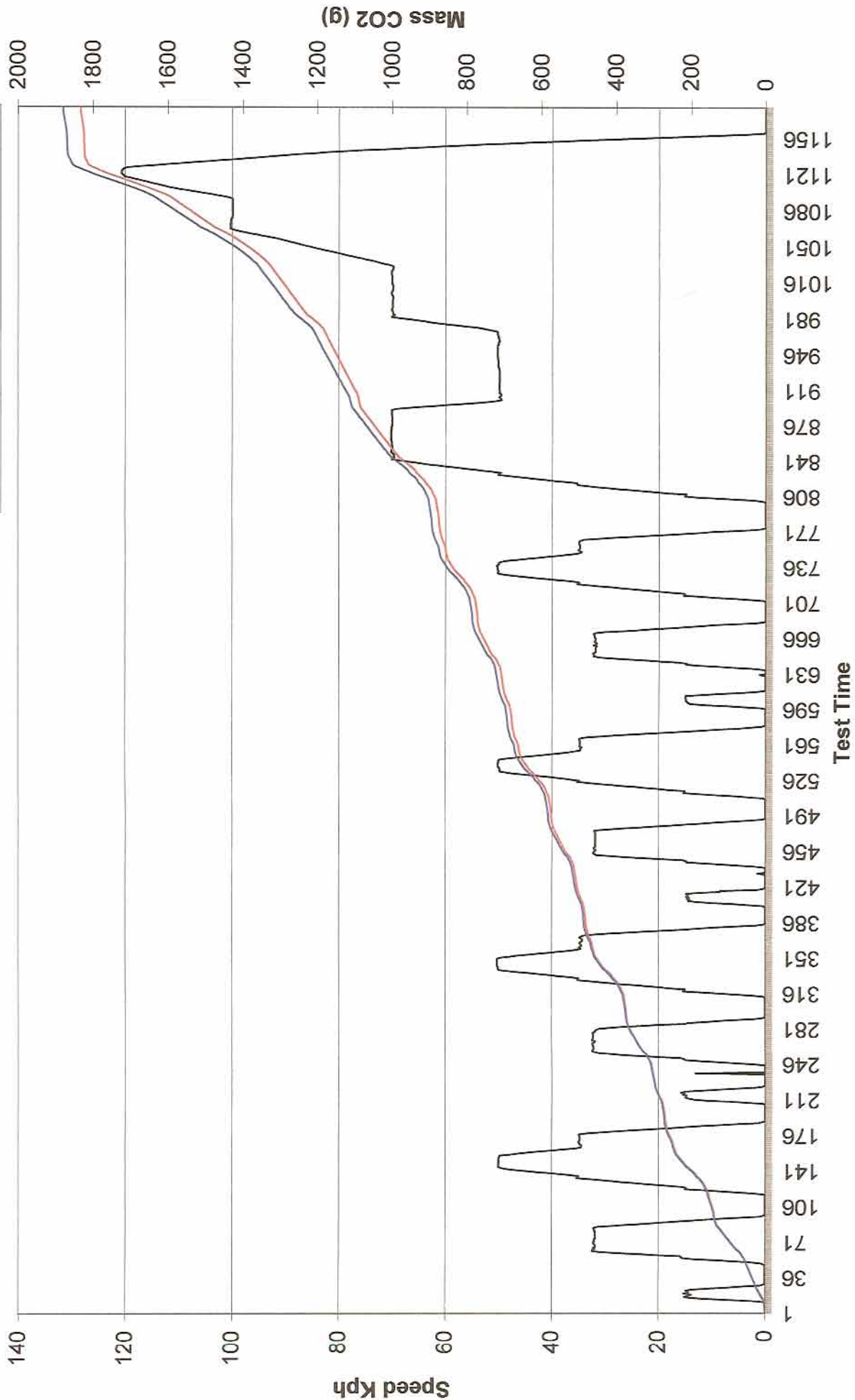
Polo Mass HC (g) Test 3

- Actual Speed kph
- Accumulated TP THC Standard Test 3
- Accumulated TP THC Ecotek Test 3



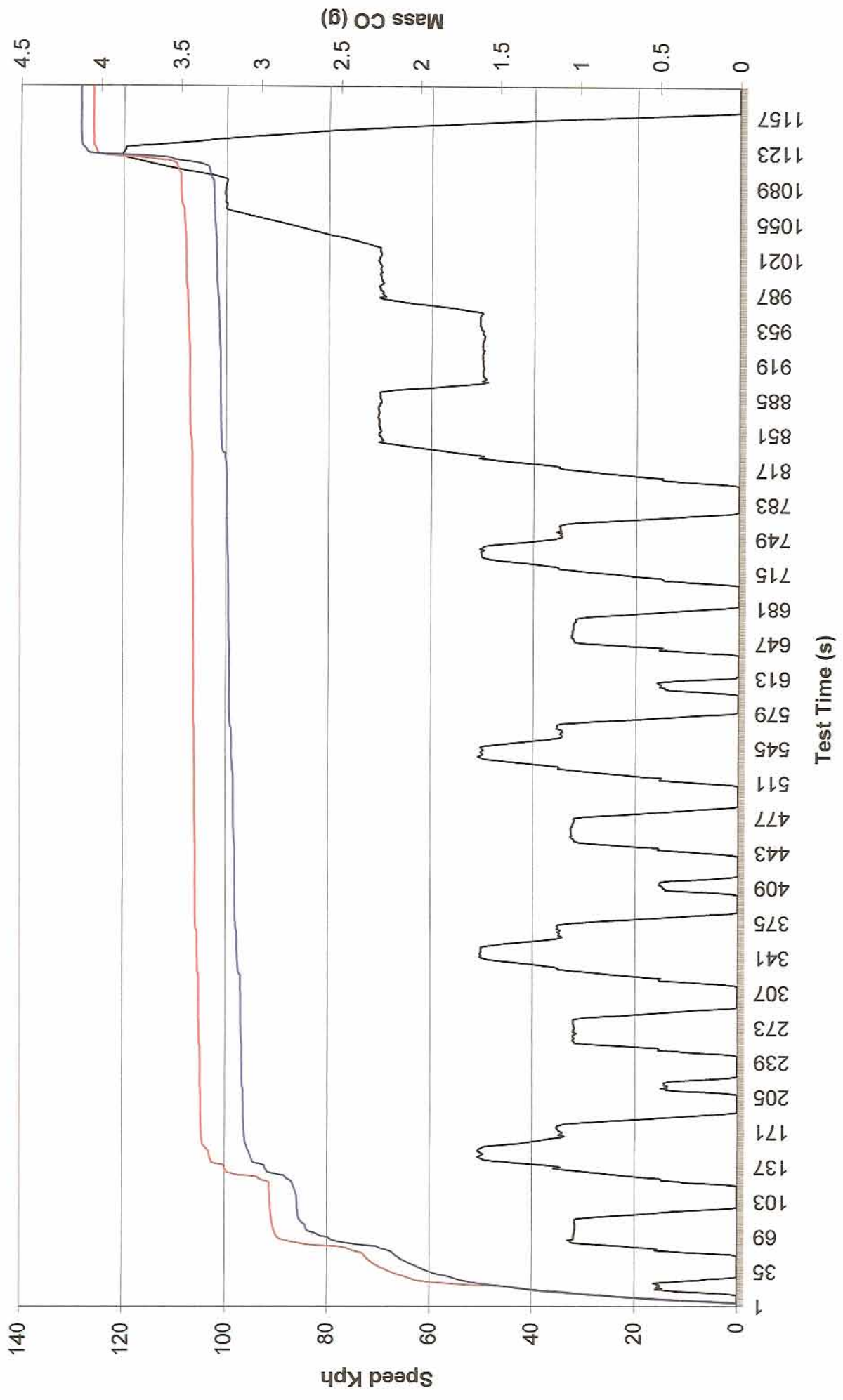
Polo Accumulated CO2 Test 2

- Actual Speed kph
- Accumulated TP CO2 Standard Test 2
- Accumulated TP CO2 Ecotek Test 2



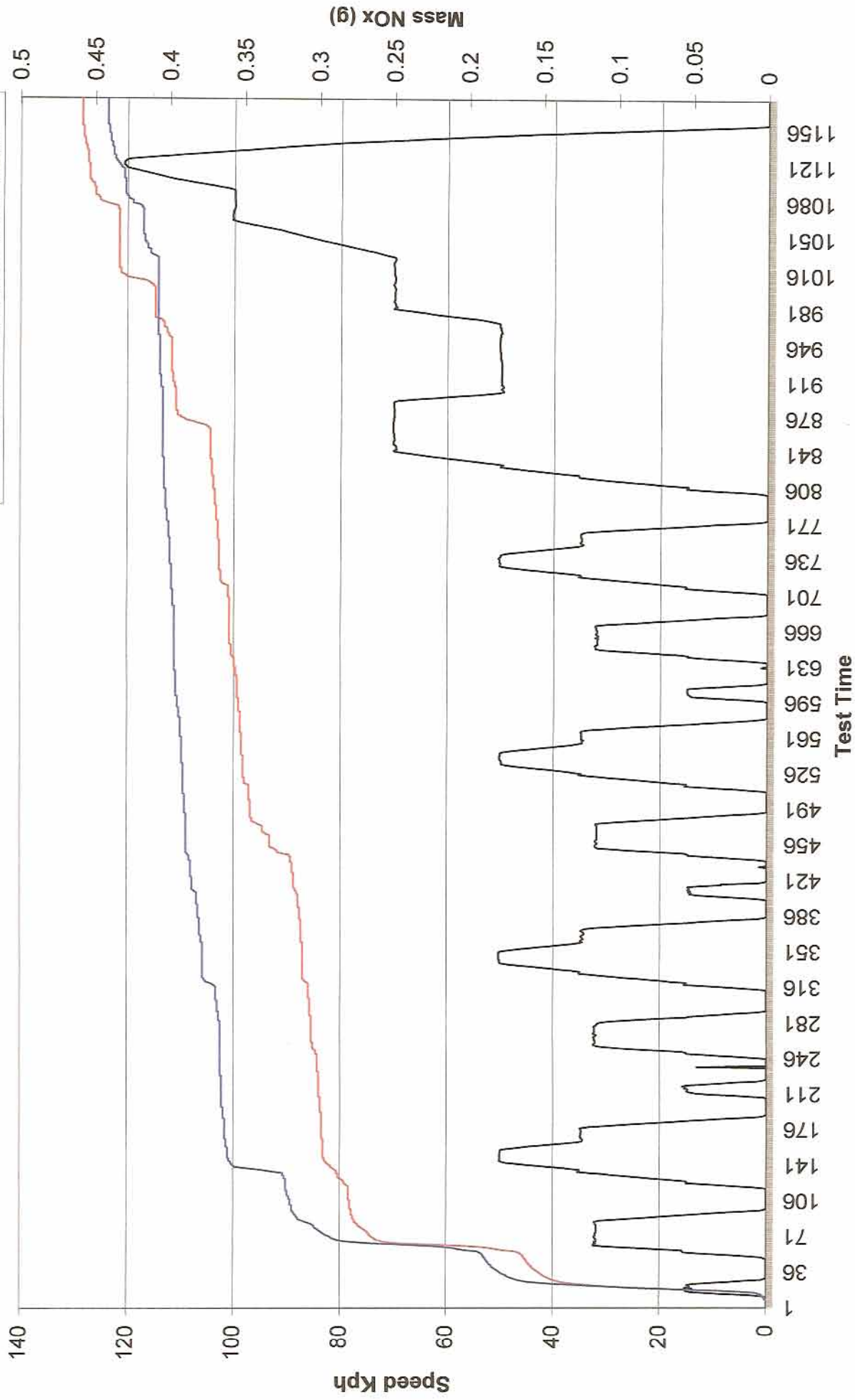
Polo Mass CO (g) Test 3

- Actual Speed kph
- Accumulated TP CO Standard Test 3
- Accumulated TP CO Ecotek Test 3



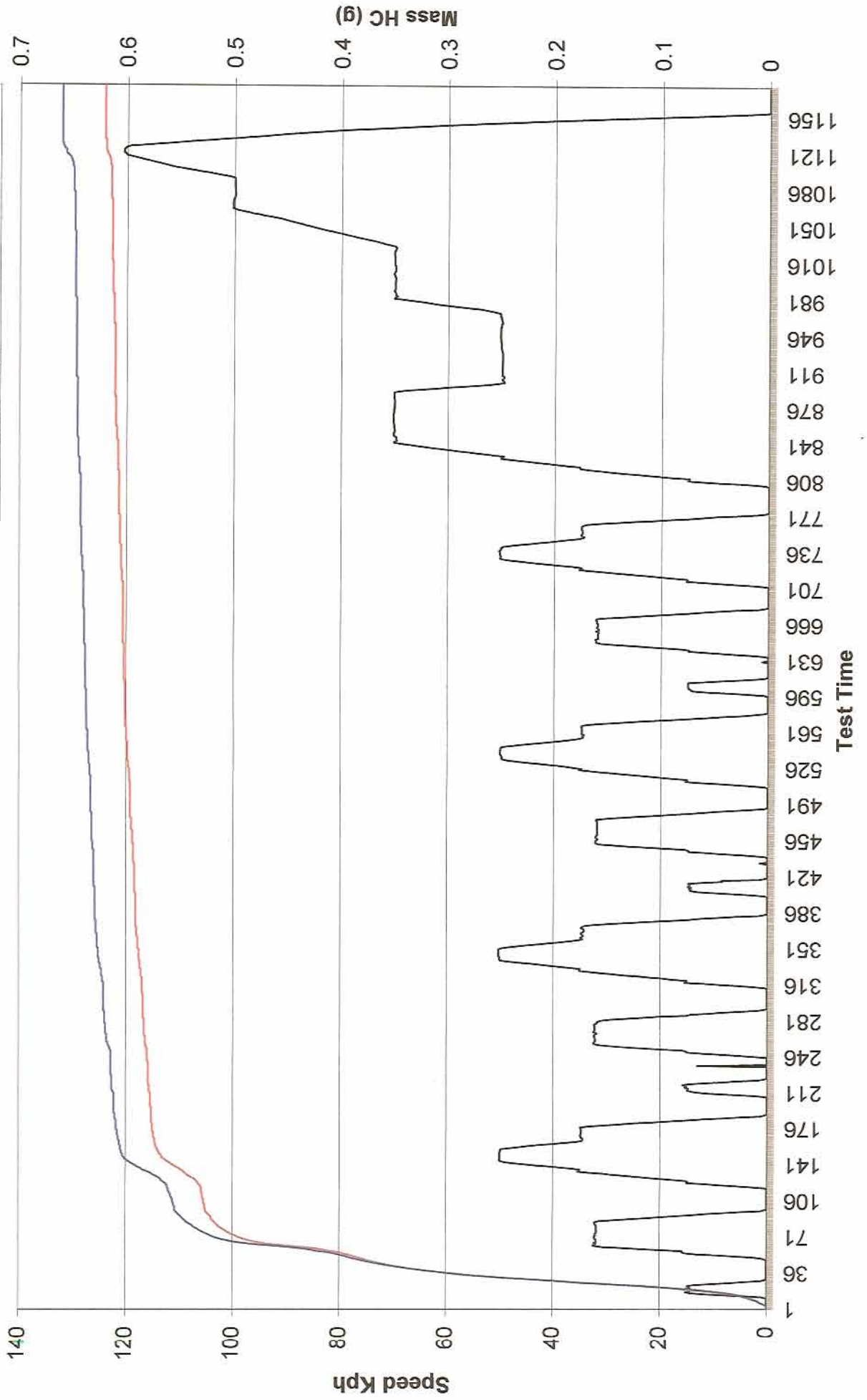
Polo Accumulated NOx Test 2

- Actual Speed kph
- Accumulated TP Nox Standard Test 2
- Accumulated TP Nox Ecofek Test 2



Polo Accumulated HC Test 2

- Actual Speed kph
- Accumulated TP THC Standard Test 2
- Accumulated TP THC Ecotek Test 2





Test Data and Support Information
for:
The Ecotek CB-26P

SECTION 3:
Motoring Magazine and Journal Tests

Eco Warrior

Black magic or pioneering research?
We fit an aftermarket economy device
to a 523i and come away surprised.

Words Jonathan Goddard



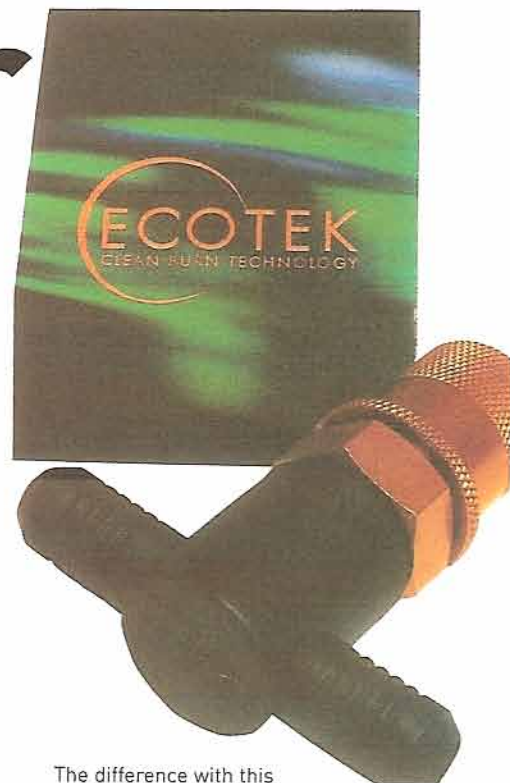
In early January the *Sunday Times* caught my eye with an offer in a small 'motoring gadgets' article on the Ecotek CB-26P Fuel Saver. The story claimed that the device, designed around Formula One technology, really worked to create a swirl of air in the inlet manifold to help the fuel burn more efficiently — resulting in lower emissions, an improvement of up to 15 per cent in fuel economy and a crisper, more responsive drive.

Now before rushing to part with my £48.99, I decided to look into things in more detail to see if the claims stood up to scrutiny and to see if there was any experience of fitting the device to a modern BMW.

My initial thought was of course that, if it was that easy to improve fuel economy and responsiveness, why isn't it fitted by BMW? Most modern cars are much more fuel efficient than only a few years ago so would fitting this device benefit an already well-engineered modern vehicle?

To use the words from the Ecotek instructions "the device injects very small amounts of agitated air into the inlet manifold at certain specific pressures. This causes turbulence in the induction gases which creates a better suspension of fuel molecules and thus combustion, producing a more efficient and cleaner burn."

Although brought up-to-date, this all sounds rather familiar.



The difference with this device over previous ideas is that air is bled into the manifold at tiny volumes — around 5 per cent of the total air volume — but is designed to cause sufficient turbulence to create better combustion. The air induction valve is spring-loaded and is designed to resonate, creating the required turbulence. The downside of this arrangement is the creation of a certain amount of noise. If this is particularly troublesome, a filter/silencer is available from Pipercross.

Installation

We fitted the Ecotek to a 523i SE E39 BMW but anyone who opens the bonnet of the current 5-Series BMW to do more than check fluid levels is a brave soul.

When you do have the bonnet open, you need to be looking for the vacuum servo non-return valve which sits between the brake servo and the inlet manifold. As the brake servo is completely hidden behind the bulkhead on the driver's side and the inlet manifold is hidden by a large black plastic cover, one can be easily thwarted before starting!



The E39 engine bay isn't for the faint-hearted but access to the servo is pretty easy.



With the intake pipework out of the way, the vacuum piping is visible.



This is where the Ecotek website starts to be of value. A network of nationwide outlets enables you to purchase your CB-26P from a local agent who can also fit the unit to most vehicles.

My local supplier, Power Services International Ltd of Camberley, Surrey, is run by Mark Hannaford and he was not only

able to sell the unit but he was keen to offer advice for my home installation, identifying the correct vacuum pipe on which the non-return valve sits and advising the best place to site the Ecotek in relation to the induction manifold. Armed with this knowledge I had the confidence to set to and open the bonnet in the privacy of my own garage.

The Ecotek is around 6 mm tall and fits into the vacuum hose between the manifold and the non-return valve. The

other side of the non-return valve has a hose leading to the brake servo. The instructions are simple: once you have identified the correct location, simply cut out a 2 mm section of the hose and fit the device in line.

BMW's non-return valve is also a tubular device fitting in-line into the vacuum hose with a small T-piece. I found it necessary to obtain three jubilee clips and an additional section of rubber hose to fit everything together and re-install on the car, making sure that the gold section of the CB-26P, with its adjustable screw top, was fitted uppermost so that future tuning of the device is possible from above the engine.

The instructions explain in some detail how to set the adjustment and tighten the locking ring. When the device is first supplied, the adjustment is screwed fully down and effectively renders it inoperative, thereby having no effect on the performance of the engine. The device is adjusted to operating mode once the engine has reached normal operating temperature.

The noise made by the unit is caused by resonance of nylon valve seats and the

anodised aluminium head but at idle it's only just discernible from inside the vehicle with the bonnet closed. As the throttle is opened this noise increases slightly. If you find it a problem, the Pipercross silencers/filters will solve the problem.

The Results

The automatic 523i was showing 56,318 miles when the device was fitted, during which the overall fuel consumption from day one was 27.92 mpg.

Taking the 1624 miles since fitting the Ecotek CB-26P the car has achieved 29.11 mpg. In an effort to find a representative comparison I have taken the 2776 miles travelled just prior to fitting the device and here I recorded 25.26 mpg.

The most striking example of a single journey occurred between Hindhead and Chichester where I recorded 38 mpg. Agreed the journey was on good roads with few stops and with the opportunity to maintain good speeds without hard acceleration or braking.

These figures can be set against the official BMW published numbers for an automatic 523i: Urban 18.5 mpg, Extra Urban 36.2 mpg and Combined 26.6 mpg. Aside from just fuel consumption I've also noticed a more urgent response when accelerating.

The facts would appear to bear out the claims that the Ecotek CB-26P really does work, even on a high-tech modern BMW.

Is the improvement worth the cost and labour effort to install? Probably, but with all things there are other considerations. If you drive hard and fast every time you are behind the wheel then you're unlikely to be interested in a device that gives you a couple of extra miles each time you fill up your tank. If you drive long distances at motorway speeds then you probably have the best chance of benefiting from fitting this device.

If on the other hand you only ever drive a few miles to the local shops or to work then the results will be less impressive.

Ecotek claims some remarkable improvements in reducing emissions, including carbon monoxide, so if you are genuinely interested in saving the planet and still driving a car, check out the Ecotek web site at www.ecotekplc.com to see the claims for yourself.

Parts Counter

Widgets

Since the early '50s the market has been flooded with gadgets all claiming to improve the performance of carburettor engines. It has been known since the birth of the modern carburettor that adding extra air can improve efficiency under certain running conditions. In its simplest form this is a gas tap device screwed into the induction manifold near the carburettor flange. The idea is to form a controlled air-leak into the manifold. Significantly the device needs to be controlled remotely by the driver to maintain the most appropriate "leak" for given driving conditions.

These days of course it is impractical to expect the driver to be able to make sensitive manual adjustment to the induction air inlet and modern sophisticated engine management computers can achieve this far more precisely.

An alternative and more practical device was available to 'agitate' the fuel air mixture - in an attempt to encourage the fuel and air to become more harmoniously united. One such device available in 1955 comprised a metal washer which was fitted between the carburettor and manifold and which carried a central spindle on which a small propeller was mounted. The mixture flow in this Chatwin Rotary Atomizer caused the propeller to rotate and create the desired agitation.

A similar device worked on the alternative principle that a stationary propeller would force the fuel air mixture to rotate and therefore create the desired agitation.

Like any good idea this stimulated further creative thought and so along came the 'mixture straighteners' to counter the mixture agitators' argument.

The principle here is a screen gauze type material fitting once again between carburettor and manifold. The theory being that the air fuel mixture directed by a butterfly valve into the carburettor has a bias to one side of the inlet to which the liquid tends to cling. The gauze in the Vokes Gasmaster Distribution Rectifier, was supposed to straighten the mixture and improve the flow efficiency as well as promoting the mix of air and fuel. A more elaborate interpretation of the gauze, known as the Vokes Rectifier, still uses a flange but this time in place of a gauze a specially cone shaped mesh was fitted. The device claimed to succeed both in respect of better distribution and greater economy due to the elimination of patchy mixture.



The Ecotek is installed between the manifold and the brake servo non-return valve.



Finished job is discreet: only the alloy adjuster is visible.

Ecotek CB-26P



It's not often that you get an invitation to test a new gadget in the motoring world. So when one was posted to the Club GTI e-mail list, I jumped at the chance to find out exactly what the Ecotek CB-26P device was all about.

I'd heard a few things about the device and read the review in Revs magazine, but I couldn't fathom how such a small "valve-type thing" could do what the manufacturers claimed it could. Such claims as "it reduces harmful emissions by improving the combustion process, this also means that it improves fuel consumption, reduces exhaust corrosion and maximises engine performance".

The whole idea of the CB-26P is based around the F1 "swirl" technology. It allows small air molecules into the engine, via the vacuum pipe leading from/to the inlet manifold, thus providing a better suspension of fuel molecules in the mixture and therefore improving the combustion process.

Now I don't know about you, but I wasn't convinced that this thing could do all that is mentioned above. However I was more than willing to test it out for all the folk out there who want to know what it's "really" like.

A quick phone call to Vince at Stealth Racing (01926) 812259, who are approved fitters of the device, and a time was set to have it fitted. With Stealth located in Warwickshire and me in Dorset, I had an early start on Saturday morning. I got there just before 9am to find the place deserted apart from a standard 16v in a parking bay.

Another Mk 2 soon appeared and Vince introduced himself and the car was dropped into the workshop to have the gadget fitted. A cup of coffee and about 15 minutes later and the job was done, easy. Just before I started her up Vince warned me that it would make some noise. Not in my wildest dreams could I have imagined the noise it actually makes. All I can compare it to is the last drop of liquid being sucked through a straw from the bottom of a drinks carton, that kind of slurping, gurgling noise. Not exactly what I wanted having gone to great lengths to perfect the induction noise from the air box.

I was assured though, that this was normal (see footnote below) and that I would get used to it, and to some extent I have. There was one occasion though, just after it was fitted, when I pulled up at some traffic lights and revved the engine to see how loud the noise actually was, and a passing pedestrian tapped my window and said, "I think there's something wrong with your car mate, it's gurgling"!

My initial impressions once fitted were great. I got back on the motorway and put my foot down and there was instant response in 4th the same as I was used to in 3rd. Pulling out to glide past the car in front in 5th actually turned into "fly past the car in front". It was quite unreal just how much difference this thing actually made! That was the performance factor accounted for. The fuel consumption was also better, getting an extra 60 odd miles more than my previous average off a full tank.

Now that I've had it for just over a week, I'm still impressed with it. I travel about 36 miles, cross country, to work, and then sit in traffic for about 20 to 30 minutes, all in all taking about an hour. Now they do say that the CB-26P works best on motorway travelling, which I agree with, but it also works reasonably for me, travelling back and forth to work, giving me an extra 30+ miles on top of what I usually get.

As for the emissions, well I got a new rear box the day before I had the CB-26P fitted and, after cleaning it on my return from Stealth, it's retained its shiny stainless steel finish so far! So the claim to reduce soot

and the like from your exhaust fumes could well be accurate too.

Absolutely everything you could possibly need to know about this product is listed on the Ecotek web site which is:
<http://www.ecotek.org.uk>

The Ecotek CB-26P retails at £44.99 including P&P and VAT, or £49.95 fitted. However, Stealth Racing are offering it for £45, including fitting, to all Club GTI members. If you are not happy with it, you can always return it within 30 days. They are guaranteed for 2 years or 20,000 miles, which ever comes sooner, so you have a fair back up!

So what is my over all conclusion? Well, I am exceedingly impressed with the CB-26P. There are so many benefits to it and for just £45, you would be pushed to find something equal to it for the price. You get used to the noise after a while, although I have been advised by Ecotek themselves, that this can be muffled somewhat by putting a foam filter around the valve. These are not factory items, so a bit of DIY is called for! Now that I have had one, I couldn't go back to how the car was before I got it!

Footnote 1: From the manufacturer - I gather from Vince at Stealth and Chris Richardson that you may be reviewing our Ecotek CB-26P device for Rabbit.

I gather also that Chris, and others, have found the device to be very effective. Apparently, the review makes mention of induction noise and I should point out that this goes away after 1-2,000 miles as the device beds in. We would be pleased to offer your members a 10% mail order discount if they ring (01483) 204444, ask for the Ecotek CB-26P and give the code Rabbit 10. For further info please refer your readers to www.cleanburn.co.uk or www.ecotek.org.uk.

Footnote 2: Club GTI disclaimer, the views and opinions expressed above are those of the contributor and do not constitute an endorsement by Club GTI of this, as with any other, product.

January 2000



steering wheels. It is available from all good car accessory shops; phone Autolok on 0161 624 8171 for details of your nearest stockist, or visit the website at www.autolok.co.uk

Economy booster

A NEW fuel-saving device, the **Ecotek CB-26P**, which fits easily to the inlet manifold, is being promoted as a means of improving performance, emissions and economy.

The device is claimed to work by bleeding a small amount of air into the induction system, as well as creating turbulence in the airflow, effects which are known to result in improved combustion.

To test the device in real-world conditions, we arranged to have an Ecotek CB-26P fitted to a reader's car, a Mk 2 Golf GL fitted with a Weber carburettor, for which there are detailed long-term fuel consumption records.

He reports: "Throttle response is crisper and power delivery smoother, but Ecotek's value for me is as a fuel economy device. I have gained eight per cent – from 37.5mpg to 40.5mpg. This is more on long motorway trips: 45.5mpg, up from 39.5mpg, a 15 per cent gain. The pay-back time is therefore a matter only of weeks.

"Fitting is extremely easy – about five minutes – the only additional requirement being a 2in. straight length of manifold hose and a jubilee clip to fit the Ecotek unit in-line between the manifold and the hose to the brake servo. An optional extra is a Pipercross filter, which will reduce induction noise and improve filtration.

"I would recommend this device to anyone: economies are made from the first turn of the key, and extra power is there if you need it." *Bruce Purvis, Winchester.*

For further details of the Ecotek CB-26P, contact Ecotek Technologies plc on 020 8287 3472 or e-mail ecotek@cleanburn.co.uk or visit the website at www.ecotekplc.co

TRIED & TESTED



Auspuff for Polo 4

INDEPENDENT Volkswagen and

Audi parts specialist **German &**

Swedish has recently added a rear exhaust box for the Mk 4 Polo to its extensive range of replacement parts. Manufactured in Germany by Ernst, the exhaust is built to a high quality, featuring a special

"condensate-free" design to greatly reduce internal rusting. Priced at £45.85 including VAT, the exhaust box fits all Polos from 1995 onwards,

except diesel, 16V and Classic models.

For more information, contact German &

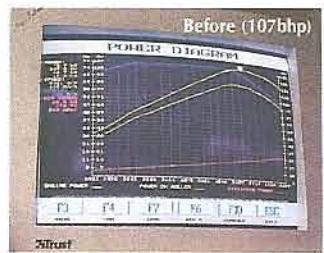
Swedish on 0208 917 3866 or see the advert in

this issue for details of local agents.

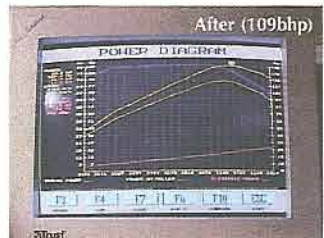


Words & pics: Peter Rosenthal

Putting the device to the test on Jabbasport's new rolling road.

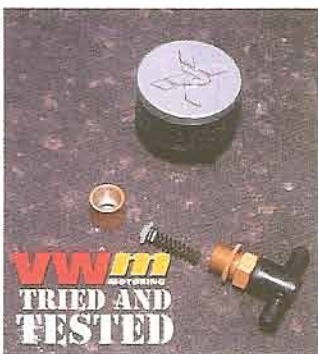


Yellow line denotes power curve, while blue line gives the torque curve. With the device shut-off the car recorded 107 bhp at the flywheel. With the device active this rose by between 1 to 2 bhp.



LITTLE BLEEDER!

The Ecotek CB-26P is an air-bleed valve that's claimed to offer lower emissions and smoother running. We put the claims to the test.



Filter unit pictured is a prototype unit. The Ecotek CB-26P basically consists of an aluminium alloy body (anodised gold), housing a spring and plastic valve. The end of the unit is protected by a gauze.

We first heard about the Ecotek CB-26P device after reading several favourable reports about it on the internet and in Club GTi's Rabbit magazine. It basically consists of spring-loaded pressure valve housed in a gold-anodised aluminium alloy body.

The unit allows unmetered air to enter the intake manifold at low manifold pressures, the atmospheric

pressure forcing additional air (up to 5%) into the engine, leaning off the mixture.

It's claimed that this offers better mixing, improving the swirl effect, and results in a cleaner burn, which in turn reduces emissions. The device is also said to smooth flat spots and improve throttle response.

It's this latter part which we were particularly interested in – numerous independent tests have been done on the emissions side of things and there is no reason to doubt their results. Leaner mixtures are almost certain to reduce emissions.

Stealth Racing, in Southam, were entrusted to actually install the device and owner Vince Saiya comments that "all the customers who've bought one have been chuffed to bits with the improvement."

The test vehicle was a colleague's Mk 2 Golf GTi 8V (Digitant fuel-injection) that was standard apart from a sports exhaust and alloys.

The unit was attached in-line with



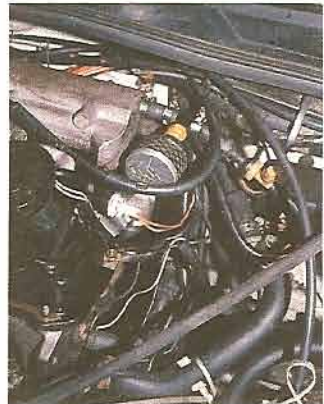
Owner of the test vehicle was Stuart Craig, seen here outside Stealth Racing.

the brake servo to manifold feed, being secured with four jubilee clips, and then 'tuned'. An odd 'slurping' noise could now be heard when the engine was on the over-run after the throttle had been blipped (Daniel described it best – 'the noise you get when you're getting to the bottom of a McDonalds milkshake!').

With the device in place, the Golf was taken for a test-drive, with owner Stuart reporting that it felt slightly friskier and appeared much smoother on the throttle. That was the subjective impressions – but what would the rolling road say?

To find out, we headed off to visit forced-induction specialists Jabbasport, in Peterborough, to test the Golf on their newly-fitted (and still gleaming!) rolling road.

Several power-runs were carried out and the order was varied to ensure that the readings would give a fair representation. With the device active the engine appeared to produce marginally more power – consistently around 1 to 2 bhp.



The unit is installed in-line with the manifold feed to the servo using jubilee clips. No hoses need to be cut.

As the Ecotek device does appear to reduce emissions – according to several other impartial mags who have used MoT-testing gear – it could prove particularly useful for owners of tuned vehicles. If you're running a high-lift cam, for example, and are struggling to get the emissions low enough to pass an MoT, this device could prove very handy. You may even be able to run a much wilder cam than you would otherwise be able to get away with. Food for thought!

Contacts:

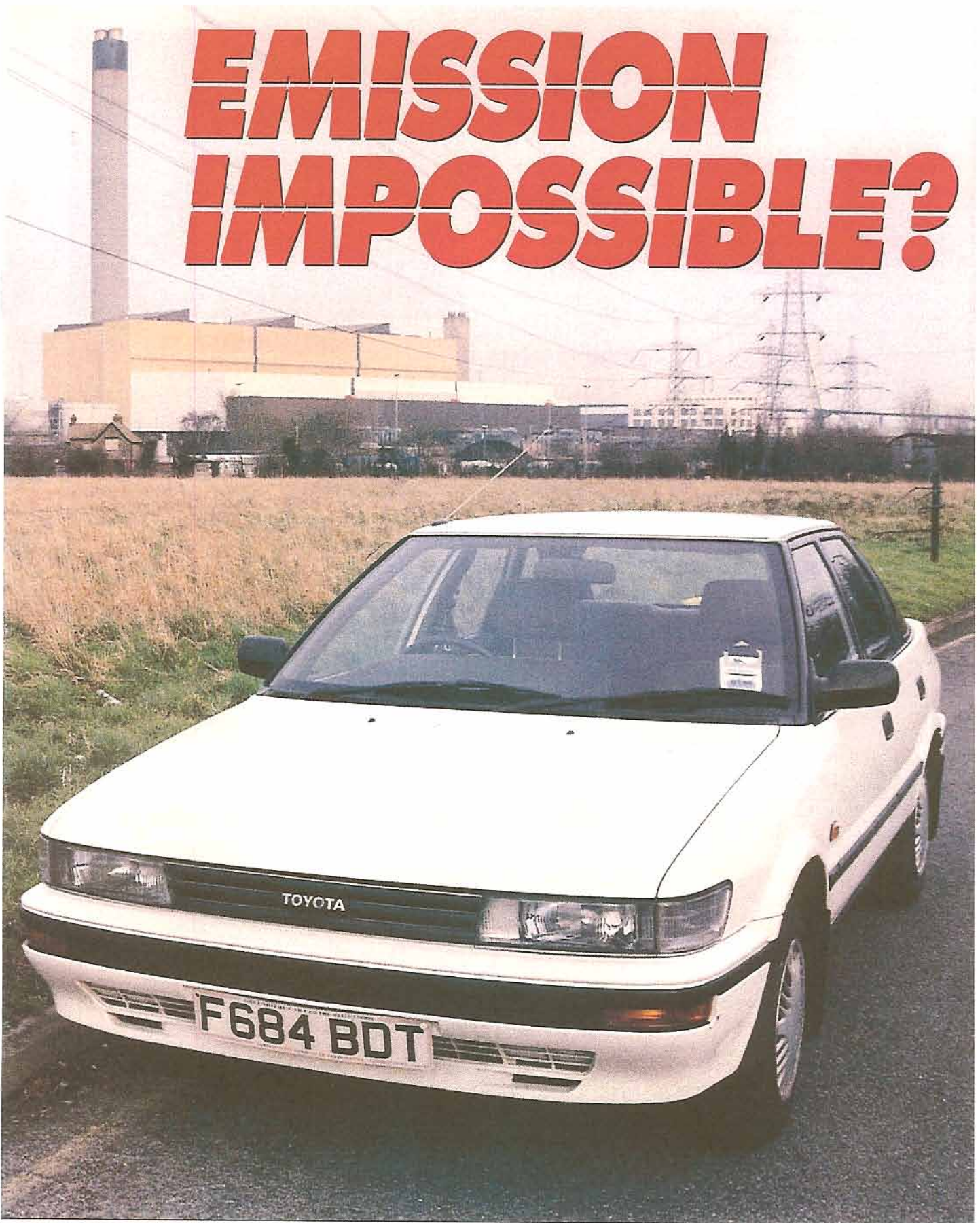
The Ecotek CB-26P retails for around £50 fitted (plus the cost of the filter head).

Ecotek Tel: (0181) 2873472
Website: www.ecotek.org.uk
or www.cleanburn.co.uk

Stealth Racing
Tel: (01926) 812259

Jabbasport
Tel: (01733) 211779

EMISSION EMISSION IMPOSSIBLE? IMPOSSIBLE?



When we were asked to try a new device called Ecotek, which claimed to reduce your car's emissions, we decided to give it a thorough shakedown. Phil Weeden reports.

The fact is, everyone's emissions conscious these days. The EU push forward with ever tightening emissions laws, which is why new cars get ever complex with their engine management systems.

But what are we to do with the 25 million pre '93 cars we have on our roads? The answer to some is to launch a scrappage scheme. But as we all know, it's the idea that should be scrapped, not the cars. The other route is to encourage the fitment of a catalyst or other device to lower those harmful emissions.

And this is precisely where the Ecotek CB-26P comes in. A very simple device, working an age-old principle with the aim of lowering your emissions. The makers even claim that the device will either improve your car's performance, or lower your fuel consumption. Intrigued? So were we.

TESTING

Now I've read some of the write-ups of this product, and I'm not convinced that they were all that thorough. What we wanted to do was test out two cars and run them for a thousand miles each with the device fitted, and then run them some more without.

So we duly had two Ecotek devices fitted: one to Art Editor Martyn Knowles' D-reg VW Jetta, and the other to my F-reg Toyota Corolla. Both are carburettor-fed cars, but it's worth noting that you can fit the device to fuel injected cars, too.

Although we had the Jetta fitted with the device first, a series of circumstances meant that we didn't actually get round to testing Ecotek properly until after the Corolla had been kitted out.

THE TESTER

We tested the emissions on both vehicles using this industrial gas tester from **Gunson**, a part of their Professional range. **Gunson** sell these machines to garages and MoT test stations. They are suitable for testing only non-catalyst cars for the MoT, however.



It's a four gas analyser, which checks CO, CO₂, HC and O₂ emissions. It features automatic warm-up and calibration. The tester is said to be extremely accurate, thanks to the use of highly sophisticated microprocessors.

If you're in the trade and are interested in buying one for your workshop, then you can call **Gunson** direct on 020 8984 0047. For general information, tel: 020 8984 8855. Alternatively, look up their website at <www.gunson.co.uk>.

The test procedure itself was simple enough. From cold we would allow the car to reach operating temperature. While it was doing this, we calibrated our emissions testing equipment (see 'The Tester'). When everything was ready, we took a number of readings at idle, so that we could obtain an average. We then revved the car to 2,000rpm, to simulate on-the-road use, and then took a further four readings and an average.

But we didn't just test it the once. Oh no! That would have been too easy. Instead we ran the Toyota for 1,000 miles in the space of a week and took a further four sets of readings using the same procedure.

Once we'd completed the 1,000 miles, we still weren't done with our test. We then removed the device and run the car again in an attempt to monitor fuel consumption. We're still not done with this part of the testing, but we intend to give you a progress report in a future issue.

So when we'd finished with the Toyota, we then ran the Volkswagen Jetta for nigh-on 1,000 miles with the device fitted, again taking regular readings. We used the same test procedure as with the Toyota.

THE RIGHT CARS

Although I'd loved to say we handpicked these cars to provide the ultimate test, I'd be lying. They were actually the two closest 'old' cars we had at our disposal!

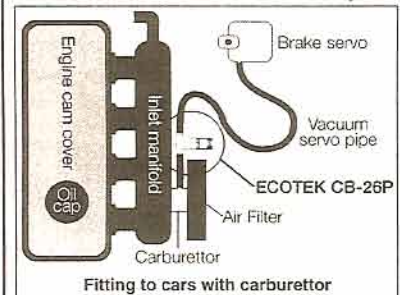
But it actually worked out really well. Martyn's 1.8-litre carburettor model VW Jetta is one of the cleanest D-reg cars I've ever come across. We've checked out the tuning, and it is running incredibly lean. Perhaps a bit too lean. The emissions before the device was installed were unbelievable. It would pass a catalyst-standard MoT test with ease. So if the device was going to make a difference on this car, it was going to have to be good. Very good.

And then to the opposite end of the

HOW IT WORKS

The Ecotek CB-26P is a mechanical device that creates a bigger and cleaner combustion. It's fitted in the vacuum servo pipe between the brake servo and the inlet manifold. It does not adversely affect braking performance. Essentially it's an air bleed valve that has been further refined.

The device utilises swirl technology, which is nothing new in itself. Formula One uses similar technology and the manufacturers have used similar principles themselves in their engines.



Fitting to cars with carburettor
Ecotek creates both spin and pulse on the minute amounts of air it allows into the manifold, creating turbulence in the inlet gases. This suspends the fuel molecules in the air better and therefore creates a bigger, cleaner bang.

scale. The Toyota Corolla 12 valve 1.3-litre that I've been using is rather ill-tuned. It was tuned just before we fitted the device to make it run a little smoother, but the car still suffers from an erratic idle. This is caused, I think, by the diaphragm in the distributor cap, which has a small pinhole in it, apparently. So this car needs all the help it can get. Any improvements in emissions would show up more on this car than the Jetta. The car also suffered from a fast idle, due to an incorrectly set cold-start valve, which meant that I was lucky to get around 200 miles to a tank of fuel. So we were hoping for fuel consumption improvements here.

So not only has our test been pretty thorough, but it's also on-going. The makers seem smugly confident, however.



The other guinea-pig vehicle: a 1986 Volkswagen Jetta 1.8-litre automatic. It was tuned last November by a VW main agent after being adjusted for unleaded and now runs very lean, so it already had exceptional emissions for a car of this age. To improve them, the Ecotek device would have to be very good indeed.

EMISSION IMPOSSIBLE?

To be fair, this is probably because it has been tested on cars other than lazy motoring journo's rusty runabouts.

The most comprehensive test to date has been the one carried out at the Department of Trade and Industry's Warren Springs laboratory. The tests were carried out on a number of different vehicles, and showed a marked improvement in all the major pollutant emissions. Carbon Monoxide (CO) was down 21 per cent, Carbon Dioxide (CO₂) was down nearly 28 per cent, Hydrocarbons (HC) were down 4.7 per cent, and Nitrous Oxides were also reduced by 21 per cent. The tests also seem to show that better fuel economy was achieved.

THE RESULTS

As I said before, the tests on Ecotek are on-going. At present, we have full comparisons with the Toyota, having run it with and without the device. The Jetta is currently being run without the device, but we as yet have no readings. Suffice to say with the Jetta, the emissions were low before the device was installed, and have remained low with the device fitted. Improvements at this stage on the Jetta appear negligible. Nevertheless, there are improvements.

With the Corolla, it's a lot more decisive. With the tests carried out at idle, the Ecotek device achieved an average 40.9 per cent improvement in CO emissions; it also managed a 13 per cent reduction in CO₂ emissions. Interestingly, HC readings appeared to indicate only a negligible improvement. Around a quarter of one per cent.

At the 2,000rpm mark, arguably the more reliable readings (because of the lumpy idle), there was a staggering 78.6 per cent average improvement in CO emissions, a 15.5 per cent reduction in CO₂ and a 35.9 per cent improvement in HC emissions.

Those are the raw facts and figures, and I think you'll agree they're pretty decisive. In short, the Ecotek CB-26P significantly reduced the emissions on



The 1.3-litre 2E unit is a great little engine. With Ecotek fitted we were hoping for fuel economy gains.

FITTING ECOTEK

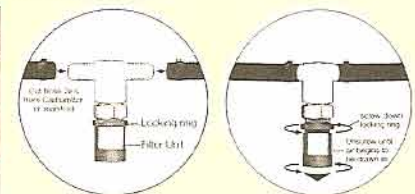
Fitting the Ecotek device is a very simple job. It takes around fifteen minutes. What's more, you can remove the device just as easily, if you decide that it isn't working. The makers say that with the device fitted, you may notice a slight difference in engine note – this is quite normal. The fitting procedure is as follows.



Locate the vacuum servo pipe that runs between the brake servo and the inlet manifold. Cut through the pipe with a sharp blade.



Fit the device in between the two sections of pipe and seal up by tightening two jubilee clips (these are not provided).



With the engine running at operating temperature, open the valve up by unscrewing (anti-clockwise) the top part until you can hear a small vibration. When you've found that point when the vibration kicks in, turn the top back clockwise one quarter turn. You then lock it in this position by screwing up tight to the top part the adjustable sleeve.

our car. No doubt about it.

The grey area comes in the other claims of improved fuel economy or performance. Now the 12 valve 1.3-litre lump in the Toyota is a very spritely engine anyway. It already offers a surge of power and rapid acceleration unlike a lot of rival 1.3-litre cars. So I'm pretty certain that the Ecotek made no noticeable difference to the performance of the car.

However, although results are still coming in, with the Ecotek installed I was achieving an average of 42.65mpg. Now a lot of this work was on the motorway and long distances. But even so, before the device was fitted the Corolla struggled to do 200 miles to a tank. With the device installed I was getting around 350 to a tank. Before the device was fitted, however, it had been run infrequently. The ultimate test will be to see what fuel consumption I get on regular runs now it's being used more often. I will let you know the results in a future issue.

With the Jetta, again it's not exactly a simple yes or no answer. The Jetta has a notorious flat spot when changing up from first to second gear (auto transmission), mainly because of its ultra lean tune-up. The makers thought that the device might improve this. It didn't. But early indications

show that it has improved fuel consumption here, too.

So there you have it. The Ecotek CB-26P is a simple little device that you doubt at first can ever work. However, our preliminary findings indicate that it does indeed improve emissions. It looks as though it may have also improved fuel consumption, although these results are by no means conclusive.

The device retails at £44.95 for DIY fitment or you can buy it for £49.95 to include fitting. For cars over 2.6-litres engine capacity, you need two devices, and they can be bought in a twin pack for £79.95, not including installation. The product comes with a 30-day money-back guarantee, and is further guaranteed for two years/20,000 miles.

Although our tests are not done, we are happy to report that we are so far pleased with the Ecotek product. It does the job. And for around fifty quid, you can't really argue with that, can you?

CONTACT DETAILS

For more information, you can write to:
Ecotek Technologies Plc
8 Manor Crescent, Surbiton
Surrey KT5 8LQ

For general enquiries,
tel: 020 8287 3472, fax: 020 8390 5716
To place an order, tel: 01483 204444

Alternatively, you can get more information, or order on-line at <www.cleanburn.co.uk>.

REDLINE RECOMMENDS-ECOTEK CB-26P

TESTED BY DAN WHITE



WE GIVE IT
4/5

I was sceptical, very very sceptical. This simple device promised great things for under £50: lower emissions, reduced fuel consumption and possibly better performance.

If I'm honest I went ahead fitting it with the intention of alerting the public to yet another bogus product. But I was very wrong.

Fitting takes a couple of painless minutes and the improvement was immediately apparent. My car now feels less breathless at high revs and seems to pull stronger than before.

I've had it fitted for a couple of months now and am more than pleased with it. The only slight downside is the sucking noise the ECOTEK creates when I lift off. It's not too unpleasant though and I've been assured that it's simple to silence should I decide I want to.

Rather stupidly, I've been driving the car with increased vigour of late thus cancelling out any potential fuel savings. I certainly haven't noticed the consumption being any worse though, despite my best efforts.

ECOTEK Technologies Plc have loads of information backing up their product, including an impressive full test by the Department of Trade and Industry. So if you want to save cash on petrol, drop your emissions and pep up your motor's performance, you could do a lot worse than getting your hands on one of these.

**COST: £44.99 INC VAT AND P&P
MAIL ORDER: 01483 204444 VERDICT: SIMPLE,
CHEAP AND, IN MY CASE, EFFECTIVE**



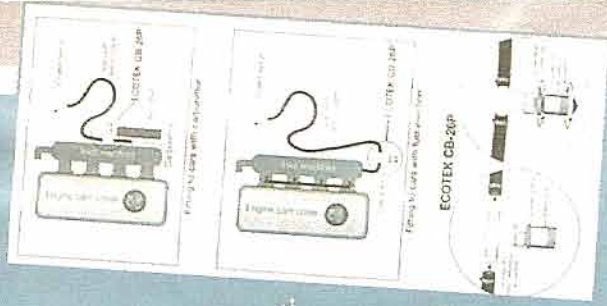
TECHY BIT

The ECOTEK fits to the vacuum servo/breather hose and injects metered amounts of air directly into the inlet manifold.

This drawing-in of air prevents excess petrol being drawn in during hard

acceleration, deceleration and excess load. The air entering the manifold is 'agitated', creating a venturi effect.

This mixes the fuel and air mixture thoroughly, thus creating a complete combustion which lessens emissions.



Small But Perfect

We live in a fuel-conscious world. No really, we do. While some of us might be buzzing around in the fastest fossil-fuel eaters going, there are those who say we should stop such a practice, that we should buy cheaper cars or take public transport everywhere we go. Hmm, balls to that. Public transport doesn't take you up the strip and the only way the government could make it worthwhile would be to have topless waitresses serving tea and bikkies, then you wouldn't worry so much if you were on time.

Anyway, despite the fact we do love burning fuel, we still want to make it last as long as possible, which is where this little product comes in. Called the Ecotek, its names suggests it's completely green but it's actually more than that. We had one on test recently and at first it seemed too simple a device to actually feel any

difference. We were wrong, and that's a good thing. We like being wrong when such a device makes your car feel smoother, faster and promises better fuel consumption. We've yet to confirm the latter but it shows all the right signs.

The Ecotek CB-26P is a non-return valve and it fits on your intake manifold vacuum hose to creating an air vortex within the manifold, keeping the fuel suspended in the air. When there's a lot of manifold vacuum this device is at its peak operation and through creating the swirl of air it means the fuel is less likely to stick to the intake walls, hence it promotes better mixture which in turn gives your engine a bigger, better bang. We felt it most of all



usually need two units to cope with the extra air flowing into the engine. Contact 0181 287 3472, or check the website on www.cleanburn.co.uk. You will be convinced.

when pulling away from low revs, the engine felt much cleaner and more eager. It was really impressive around town when driving on part-throttle.

Now, at £49.95 fitted you're unlikely to find better value for money. The guys behind the marketing of this device, Steve Daley and Barclay Lamont, say that although it was originally intended as a fuel-conscious device, it's gaining popularity as a performance product too. It'll go on any car, though V8s

FEBRUARY 2000 Volume 21 No. 10

EDITOR Richard Nicholls
ASSOCIATE EDITOR Tony Beadle
FREELANCE CONTRIBUTORS Jon Hill, Mike Key, Jon Betts, Steve Kirk, Mark Gredzinski, Mark Saward, Andy Willsheer, Jim Maxwell, Ross Graham, Zoe Harrison, Tim Hulley, Anders Odeholm, Mike 'Ban Man' Thompson
DESIGN Creative Works (0181 669 1640)
ADVERTISING EXECUTIVE Carl Henderson
ADVERTISING COPY Shirley Trower
GROUP ADVERTISING MANAGER James Stainer
PUBLISHER Clive Househam
DISTRIBUTION MMC (01483 211222)
COLOUR ORIENTATION Flare Repro (01323 845523)
PRINTING Garnett Dickinson (01709 364721)
ACCOUNTS Trudi King
ADMINISTRATION Jenny Johnson, Sandra Househam, Carole Wood, Antonella Menhennet, Carol White
ADVERTISING: 01737 819555. Fax: 01737 812030

ADMINISTRATION: 01737 814311. Fax: 01737 814591.

E-mail: streetmachine@chpltd.com **EDITORIAL:** Tel/Fax: 01932 228350.

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TRIED & TESTED

...went the distance, now I'm back on my feet, just a man with the will to survive

COURTENAY VECTRA TAROX SIX-POT CONVERSION

£1304

TESTER: BRYN
CONTACT: COURTENAY ON
01692 404 313

These are big brakes, and I mean big brakes – six-pot Tarox 40-groove, 320mm discs to be exact.

I went along to Courtenay to see them being fitted to customer Mark Thomas's six-month old Vauxhall Vectra GSi V6. Mark is a driving instructor, specialising in advanced techniques, so his progressive driving style needs more braking power than the standard Vauxhall set up can provide.

Although Courtenay have done this conversion on the Calibra before, this is the first Vectra they've done.

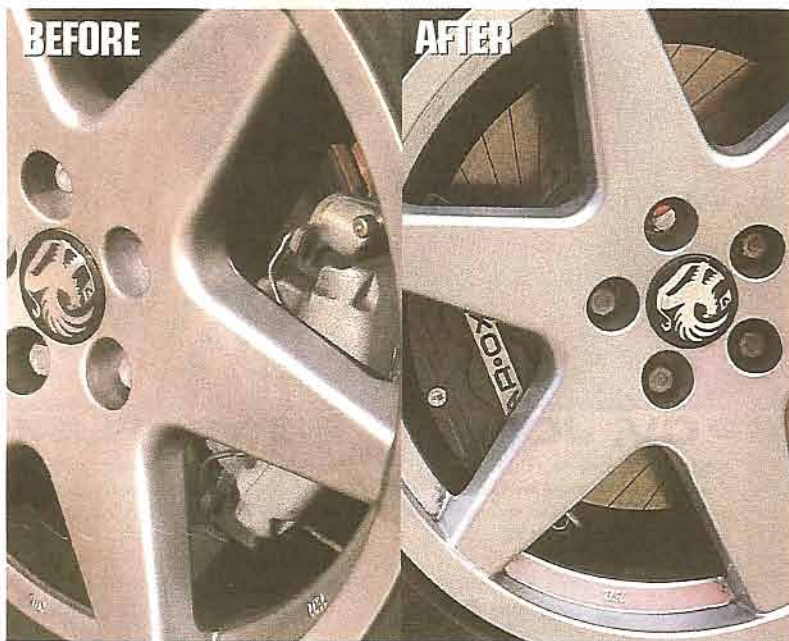
The kit itself contains everything you need: bells, discs, bolts and Tar-Ox Spike pads.

Fitting proved to be straightforward, with only a little cleaning needed on the hub to slide the new discs in place. With the wheels back on, the first thing you notice is the size – they look fantastic.

After a short drive with Mark, you can tell he's impressed. Already the pedal pressure is much firmer and positive, but it'll take another 500 miles to properly bed them in.

A week on and Mark's done 300 miles, here's what he's got to say – *'There used to be a lot of pedal movement, but not any more. On an advanced cross country progressive run, you can be far more confident, they just inspire you. What Vauxhall should've done as standard.'*

So for fast point-to-point driving, with the odd track day mixed in, they're the only way for Vectra heads to go.



ECOTEK

£44.99

TESTER: BRYN
CONTACT: ECOTEK ON
0181 287 3472

I've got to admit it, I was interested in this Ecotek CB-26P. The device claims to reduce emissions and fuel consumption. Bold claims, and cheap at the price if they're true.

The unit fits into a vacuum servo hose close to the inlet manifold and is a non-return valve which injects minute quantities of agitated air into the manifold at certain pressures. This leans the mixture

very slightly – the quantities of air involved are about 5%, but they are sufficient to create the turbulence necessary to produce improved combustion efficiency. Anyway less of all that techno babble, does it do the business?

We took a couple of Ecotek unit's along to our spanner wielding chums Supamek, where we tested the product on an '87 1.4 Astra. We ran it up on the MoT emissions tester, and come up with a CO figure of 1.32% volume, and a CO2

reading of 14.1% vol. It took us five minutes to fit the Ecotek, and the results were good. 0.47% CO and 12.3% CO2, a marked improvement all round. After a quick test drive, response was up and the car pulled through the gears much smoother.

Not content with just one test, Danny from Supamek also fitted one to his Calibra, having no emissions due to the fitment of a cat. These were his conclusions: *'When going up through the gears on the rev limit the car used to die momentarily as I changed. It now pulls cleanly and I'm well happy – a chip upgrade does the same job. So I reckon I've saved about a £100, which can't be bad.'* Fitted to everything from Bentleys to Corvettes, these things work. If you don't trust us, you'd trust the Department of Trade wouldn't you? Even they liked it.



POWER STEERING LUBE

£8.99



TESTER: SIDNEY
CONTACT: ANGLO AMERICAN
PRODUCTS ON 0118 951 5666

Call me old fashioned, or blame it on my Northern attitude towards new fangled things, but how the hell can an additive help my power steering work?

According to this new funky stuff from Pro-Blend, it cools power steering fluid anywhere up to 28°, stops rack and pinion wear and triples pump life.

So to test it, I stuck the stated dose in my motor. This is easily done by adding to the power steering fluid reservoir. This should give it a good work out as the Golf's footprint's bigger than my pigeon shed. This outs more load on the steering than owl.

Once it's in, and the car's been running long enough to mix it in, I'm off for a drive round our car park.

I hate to admit it, but the steering feels smoother. On slow speed and stationary stuff, the steering doesn't snatch or tug like it used to. Even on full lock, it stays silky smooth.

By eck this works, go 'en, tell ya mam, son.



WOT

COMPILED BY >> MAX P. PHOTOS >> VARIOUS

MINISTRY OF TESTING

Max Power's testers put loads more weird and wonderful gear through its paces...

Items tested, including contact names, telephone numbers and official Max Power ratings

ECOTEK CB-26P

You've heard it before – a product that's supposed to improve performance and fuel economy. Many companies have tried but only a handful have pulled it off. Ecotek are one of the successful few. Their CB-26P is a simple yet effective add-on that can increase power and reduce your fuel bill.

Based around F1 technology, the CB-26P causes air turbulence in the inlet manifold to increase combustion efficiency. I tried one out on my Mk1 Golf.

I fitted it to the brake servo's breather pipe, approximately six inches from the inlet manifold. There was a noticeable improvement in throttle response – especially in the midrange. And the frequency of my petrol station visits have dropped radically. I usually get about 100 miles for £15 of unleaded, but with my new best mate I'm averaging around 120-130 miles. And the best bit is that the faster you go, the greater the benefits reaped.

An inspired technological invention easily affordable for pocket money modifiers – *May P.*

Contact: Ecotek

Telephone: 020 8287 3472

Website: www.ecotekplc.com

Price: £49



Pass
Fail
N/A

Items tested, photographic evidence



MIG Product Test - CB-26P Ecotek Valve

The CB-26P, commonly referred to as the Ecotek valve, claims to reduce emissions and improve fuel economy. After seeing many posts on MIGWeb by users asking whether this product worked or not, I felt it was time to do a proper test and find out once and for all.

The valve is designed to regulate un-metered air into the inlet manifold via the vacuum pipe. This leans the mixture, but the extra turbulence in the inlet manifold causes a cleaner burn, so the leaner mixture does not adversely effect the engine.

The test car was my 1996 Astra Mk3 Sport 1.8 16v. To be fair, this car already has good economy and clean exhaust emissions. If the CB-26P can make a noticeable difference here, then it should also show a difference on most other engines too.

Fitting was easy - the unit comes with detailed instructions so I will not go into the fitting details in this article. Just be careful not to cut yourself while cutting the vacuum pipe - as I managed to do!



Fitting the vacuum pipe



Tuning the CB-26P



The finished product fitted (without filter).

Once fitted it needs to be adjusted correctly. Follow the instructions carefully at this stage as a badly set-up CB-26P will not deliver the goods. Once mine was set-up correctly there was a bit more induction noise, but it was not too intrusive. Inside the car it was not noticeable even with the stereo off. I also had a CB-26P silencer, but I left this off for the initial test. Fitting the filter did reduce overall noise produced by the valve.

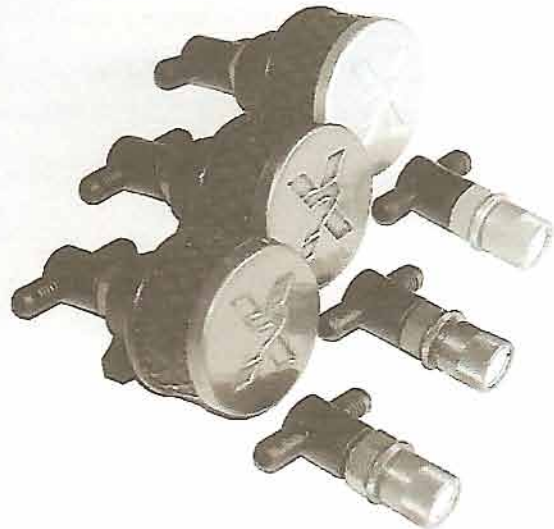
With the valve in place, driving felt largely unchanged. It is easy to be tricked psychologically into thinking there are differences in the way the car feels - cleaning your car can have the same effect. If I was pressed to state perceived improvements, these would be that the engine takes slightly longer to spin down - this makes for smoother gear changes, also there does seem to be slightly better throttle response.

When testing a product like this it is important to maintain a normal driving style. It would be easy to give this product a hard time - but this will not give reliable results. On the other hand, it would also be easy to coax better economy out of the car with the product fitted. I tried my best to drive as I usually do.

Before the valve was fitted I completed almost 1000 miles without the trip computer being reset and on the same fuel. This returned a stable 35.3mpg. After 1000 miles with the CB-26P this figure had increased to 37.7MPG. This shows a marked increase in fuel economy and should give up to an extra 25 miles per tank. This would save the average motorist over £100 a year in fuel. Within six months this unit will have paid for itself.

There have been many other tests on this product and it seems that the savings depend on the particular application. My Astra is a fairly economical car anyway, so an extra 2.4mpg is good going. Other tests have shown far greater savings, especially on older cars.

On testing the emissions I found that they were already extremely low as my car has a cat fitted. Tested at idle, the car started out with a CO level of 0.02%. With the Ecotek valve fitted, this dropped to 0.01%. This is only a very small drop, but you could look



at it as a 50% reduction - which isn't bad! Similar results were obtained at 3000rpm.

Carb'ed cars are going to benefit most from a reduction in emission. As we were unable to test this, here are some archive results from previous tests: Cavalier 1.6 43% reduction in CO at idle, 50% reduction at 3000rpm. Mercedes 190 53% reduction in CO at idle, 51% reduction at 3000rpm. Unlike with my car, this reduction typically represents a drop from 8% CO to 4% CO! Now that really is a major reduction in emissions.

Overall, the Ecotek CB-26P appears to do exactly what Ecotek PLC says. It does reduce fuel consumption



Emission testing

and emissions, as well as making the car feel a bit smoother and livelier.

You can order your own valve from www.ecotekplc.com. Price for the valve start at £48.99 which includes VAT and postage. I suggest buying one with a filter - this starts at £69.99 depending on which colour you go for. Alternatively, why not enter this months caption competition as Ecotek have given us and valve and filter to give away to one lucky member!

Many thanks to: Barclay at Ecotek PLC. You can visit their website at www.ecotekplc.com, call 01483 204444 or email ecotek.help@virgin.net.

The MOT Workshop, Chichester 01243 536841 for doing the emission tests.

Words and images by Mike Warner

Ecotek

• Small • Cures rough running • £50

If you're cursed with a dodgy carburettor, help is at hand from a useful little gadget from Ecotek. JASON THOMAS tries one on his Mk2 Golf GL.



Having owned a Mk2 Golf 1.8 GL for several years now, I have grown to loath all that is the Pierburg 2E2 carburettor. The hesitancy when cold that puts you in very dangerous situation, the sub-300 miles to a full tank of petrol and the constant trips to the tuners to sort out the choke settings, fast idles, slow idles and CO2 levels. All in all, not good. And because of its inability to be performance tuned it has made me look at other options.

Option one (one which Tim Stiles swears by) is the replacement carb by Weber. The Weber offers greater 'tunability' but has two drawbacks: the manual choke and the price tag of £206 completely unfitted. No use at all if you're not mechanically minded – add another £50-£100 for fitting and set up.

The second option is the Ecotek. This gadget, whilst not new on the market, remains remarkably and relatively undiscovered. It claims to give greater performance, increased mileage and reduced emissions at a greatly reduced price of £49 with the simplest of fitting instructions. A filter is also available at a

cost of £15.

So what's it all about? Well, the Ecotek, once fitted gives a positive swirl to the intake gasses and produces a more positive and efficient burn once ignited. Got it? It achieves this by drawing in ambient air and introducing it to the intake gasses within the inlet manifold itself. The Ecotek comes with full fitting instruction and is so simple to fit. It is fitted in the brake servo line that runs to the inlet manifold just before the non return valve. Once this area has been established, the hose is then cut with a Stanley knife (watch those fingers) and using jubilee clips insert the Ecotek into the gap. That's it. Just the setting up to complete the job.

With the engine running, turn the valve top so a constant 'chirping' noise can be heard, then turn it back a quarter of a turn and pinch the lock nut up to secure it. Sorted. If you've opted for the optional filter, this can now be fitted. The Ecotek does make a chirping noise during engine deceleration but with the filter fitted and within 2000 miles under its belt the chirp reduces greatly.

So how does it perform? The car is now a lot less hesitant when cold, nearly non-noticeable. Through the gears the engine seems more positive and smoother and when pressed hard quicker as well. As for fuel consumption, a full tank now get me 330-350 miles so the Ecotek has started paying for itself already. The Golf also passed the emission test on its MOT with out any adjustment for the first time. So far no down sides have been experienced with the Ecotek and it's been running now for 3 months.

So if you're looking for the cheaper option to sort out your dodgy Pierburg or looking to increase performance, miles to the gallon and reduce emissions on any car, fuel-injected as well, then the Ecotek could be just what you're looking for. Too good to be true you may be thinking? Don't just take my word for it, try it! Call 01483 204444 to order one.

SLASH YOUR FUEL COSTS!

Although this year's Budget wasn't as bad as expected, the fact is we're still paying the highest fuel prices in Europe. So check out this guide – it could save you up to a £1 a gallon. Alan Anderson explains.

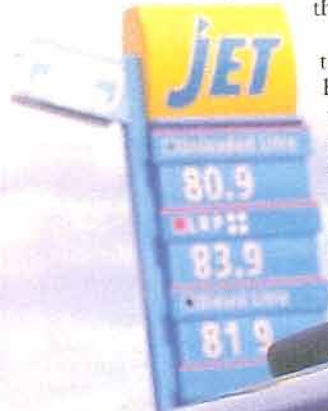
More than 30 years ago *Car Mechanics* ran a major feature on how to get the most miles from a gallon of petrol, horrified by the prospect that it was costing you the same as a pint of beer! Well, we don't know where you drink but it must be mighty fine ale if it's the same price as unleaded fuel is these days!

Having now the dubious honour of selling the most expensive fuel in Europe – possibly the

World – who doesn't want to get the most mpg out of their car?

It costs £50 to fill up a Mondeo, yet the sobering fact is that the majority of us are wasting as much as a £1 on every gallon every time we drive our cars – be it by an out of tune engine, bad driving or sheer laziness.

Motoring is now reported to be the biggest single



expenditure in a household, costing up to £70 a week, most of it as indirect taxation – so let's start clawing some of it back, NOW!

GET IN TUNE FOR SAVING MONEY

You may think your car is in sound order, but the odds on chances are it isn't. The advent of longer servicing intervals is causing an increasing number to slip out of tune and simply pour good petrol away.

One can't emphasise the savings regular tune-ups make. Past-it plugs, leads on their last legs and clogged cleaners are the main culprits for lost gallons with a modern fuel injected engine, according to leading engine specialist Hometune.

As oil changes become less frequent then less attention is paid to the breather systems and as they sludge up it causes engines to run richer as a consequence. Hometune say it's now their most common 'find' when servicing a car. Remove the pipes to thoroughly clean them and replace the breather's filter, if fitted.

Similarly spark plugs are becoming a fit-and-forget component (and hard to get at) yet their performance in a modern computer-managed engine is more critical than ever.

At the very least, check them every 6,000 miles for health: remember they can tell you a lot about an engine's fitness and state of tune.

Ignition leads have a service life of

around 50,000 miles. Thanks to higher-powered ignitions and tougher under bonnet conditions these take a real hammering. Worse still, they can unknowingly break down under load and cause an undetected misfire, which not only affects performance but can seriously damage a cat, if fitted.

Modern fuel injection systems are usually extremely robust and stay in tune for long periods. There's little to do other than check that the cold start system works properly, plus see that all the connections and linkages are free from corrosion and there no leaks throughout the fuel line.

Hometune is a firm believer of dedicated system cleaners to purge the fuel line of gum deposits and tarnishing, especially in the injectors. Periodical use of a pour-in solvents can really revitalise performance and economy on petrol and diesel engines alike.

It's a myth that air filters can last for years. The stated long service intervals often found in handbooks only relate to "normal driving conditions" of which there's no such thing! Take a regular look and replace them if they are even slightly suspect.

Even the choice of oil can have a benefit on fuel consumption. Modern engines require a light grade due to their tight working clearances – a too heavy brew affects engine performance and can cause valve-stick. Mobil claim that by using their Mobil 1 fully synthetic oil, motorists can gain a couple of extra miles per gallon as well as added long-term engine protection.



Longer servicing intervals have led to an increasing number of cars slipping out of tune. A regular tune-up keeps your car running more fuel efficient and better performing.



Another key to better fuel economy is simply ensuring that the car is breathing properly, so check your air filter. This is particularly important if you do a lot of town driving.



With spark plugs lasting longer, and being placed in harder to reach places in the engine bay, it's very easy to overlook their condition. They don't stay like this forever!



Modern injectors are very durable, but it's still worth running a reputable cleaner through the system every now and then to rid the fuel line of deposits and to remove tarnishing in the injectors.



We recently tested out an emissions device called Ecotek. The makers claimed that it could improve fuel consumption or performance. Our early results indicate that mpg does improve.



SLASH YOUR FUEL COSTS!

There's no denying that an annual proper diagnostic tune-up is well worth the money, even for owners who take pride in their DIY ability. It's certainly the best way to check and adjust mixture and timing settings, plus detect faults under load.

Older carb-fed engines are much more prone to being out of tune. Vauxhalls, Fords, Citroëns and Peugeots are notorious for drinking petrol at an early age due to their poorly designed carburettors. The best bet is to junk them for a Weber straight replacement with manual choke. Although they cost on average £200-250, it's money well spent if you intend to keep the car.

OTHER FUEL SAVERS

Making a car fuel efficient isn't simply about keeping the engine sweet. Precious fuel can be wasted by something as innocent as binding rear

drum brakes, incorrect tracking, under-inflated tyres or an overweight tool box stashed in the boot!

Start with the cooling system. An aged, sludged thermostat will cause the engine to take much longer to warm up than it should. Nothing's more wasteful on fuel, particularly on a cat-equipped car where the fuel mixture is deliberately set to run rich to help warm up the catalyst.

On an average car, attaining 30mpg, it can drop as low as 10mpg on the first few miles from a cold start up. The quicker the engine reaches operating temperature the better: if you do a lot of short runs it may even pay to blank off a small section of the radiator to aid this – but keep an eye on the temperature gauge.

Out of alignment steering geometry can nick a couple of mpg as well as prematurely wear out expensive tyres. As just an innocent brush with a kerb can knock the tracking out of true, it pays to have it checked annually.

Even tyre choice can save on fuel costs. Special energy-saving tyres are proving increasingly popular. Michelin

Continued on page 8

FOUR STAR REPLACEMENTS

It's almost six months since four star was banned from the UK (although it still survives in small quantities), what's been happening now lead is dead?

Quite a bit is the answer. Let's start with LRP, lead replacement petrol. According to the Petrol Retailers Association, sales have been largely as expected, although they are expected to dramatically fall by the end of the year, as the older car parc rapidly diminishes – or cash-strapped motorists gamble and run on unleaded and hope for the best.

Indeed, already Holland has withdrawn LRP petrol due to low sales and it could well be dropped in the UK by 2002 or sooner. Garages don't like stocking it as it takes up a valuable pump but is only used by 10 per cent of customers.

What is significant is purchasing hot spots across the country. According to trade valuation specialist *Glass's Guide*, rural-based motorists are more inclined to buy LRP compared with well-off city dwellers. *Glass's* claims the ratio of unleaded to LRP is ten-to-one in the city against four-to one in the sticks.

Sales of aftermarket lead substitutes have generally reached expected targets, although some companies quietly admit that they over-estimated uptake. It's claimed that half of all sales go to classic car enthusiasts "who just don't do the mileage", according to one.

However the real story is the health fears of unleaded petrol and lead substitutes. MTBE, a substance which boosts octane rating in unleaded petrol, has recently been banned in the United States because it's considered such a danger to health and has a high cancer risk element. Currently research is being carried out in Europe on MTBE, some of it funded by the petrol industry.

MMT concerns a manganese additive which is found in certain aftermarket lead substitutes. Again this is considered by some experts to pose a high health risk, although as yet there's nothing concrete to base meaningful further comments other than claims and counter claims are ongoing between respective parties.

What is known, however, is that some additives perform better than others and there have been reports of engine problems and overheating (just wait until the summer for the problem to really rear its ugly head!) on older cars. Also, there are cases of premature turbocharger failures in Sweden.

The best way to fend of troubles during the hot summer is to thoroughly flush out the cooling system, including the radiator fins, if you envisage some arduous motoring.

Perhaps good old lead will make a return? Well, New Zealand – which admittedly has a much older car parc – is currently looking into a return of low leaded petrol because it's not as dangerous to man or machine as its numerous alternatives are. Did someone mumble I told you so?



Particularly important on modern multi-valve engines is the choice of motor oil. If you opt for the wrong one, the result could be valve stick.



We know we're preaching to the converted here, but it's worth reiterating the importance of checking your car's oil level. You'll be amazed how many car owners fail to do this.



As a general rule, older, less advanced engines require a thicker grade motor oil, whereas modern multi-valve engine require lighter, semi-synthetic or fully synthetic lubricant.



Sometimes you could be burning fuel needlessly because you're inadvertently slowing the car down due to binding brakes. So it's always worth checking these on a regular basis.

SLASH YOUR FUEL COSTS!

claim their Energy tyre is some 20 per cent freer rolling over a conventional design and thus can save up to six per cent in fuel use over 12,000 miles, equating to approximately £70 a year in the trouser pocket!

Even if your tyres are in good order, under-inflation will create less drag and sap fuel. Don't over inflate, but you can run them at their highest recommended pressures.

If you need new covers, why not consider opting for a slightly larger tyre, or a higher profile type to raise the gearing and help mpg. Naturally, check that they will safely fit on the rims and

not foul your car's steering, suspension or brake systems, but it's worth a thought. Speak to your local tyre specialist for further advice.

And that ton of tools? Formula One designers spend millions to shave just a few kilos off their cars to maximise performance yet motorists lug around all sorts of weighty junk in the boot. Have a clear out and take that roof rack off if it's not needed.

Have you considered converting your car to run on Gas? As our April

edition showed, LPG can slash your fuel bills by half. However, it's expensive to install and the gas tank steals a lot of luggage space. It's only really viable if you cover a lot of miles and intend to keep your car for a long time. For fuller details, obtain a back copy from our offices (plus check out our July 2000 issue next month, **Ed**).

Fuel saving devices have largely been viewed as gimmicks ever since the year dot. However, one product we've recently been testing is the new Ecotec CB-26P. Primarily its job is to clean up emissions by helping the combustion

process, but there is a notable economy spin-off. It's not particularly cheap at nearly £45 (or a £79.95 twin pack for engines above 2.6-litres), so you need to cover a lot of miles to break even, but it could also be a real boon to improve flagging emissions

come MoT-time. Again, more details are in our April issue.

Finally, your driving. Now we won't go into detail here – after all it's not us who drive badly – it's all the others! But remember the basic rule that the harder and faster you drive, the more fuel you'll burn up. And just a little thought to reading the road ahead using the maxim "more speed – less haste" will get you there just as quickly, but with less stress and a fuller fuel tank. Okay?



Poor wheel alignment can also result in lower mpg and accelerated tyre wear. So have this check at least once a year. You can often get free checks carried by firms such as ATS.



There is now a choice of so-called fuel-saving tyres. Michelin's Energy tyre is claimed to save up to six per cent in fuel over the course of a year.



Power play



Eric Fowler fits a fuel-saving/power boosting device to his car

WHAT IS AN ECOTEK?

The Ecotek CB-26P (CB for Clean Burn, 26 P for 2.6 litre petrol – the maximum size of engine on which it will operate successfully) is designed, pure and simple, to make a car's engine run more efficiently.

It consists of a housing containing a non-return valve and venturi tube, which is fitted either directly into the inlet manifold, or more simply, let into the vacuum tube which runs between the inlet manifold and the brake servo, as close as possible to the manifold on the car engine and between there and any non-return valve in the system.

In action, it injects minute quantities of agitated air into the manifold at certain prescribed pressures. Although this does effectively create a leaner mixture, (about 5 per cent), it has no adverse effect on tick-over. At the same time, it does create a certain amount of turbulence and this in turn greatly improves the combustion efficiency of the fuel/air mixture.

The device is made in England to the highest standards, and from the best quality materials and in the unlikely event of mechanical breakdown, carries £5 million of product liability insurance.

Ecotek operates in four stages, according to engine revs at the time.

1. At low revs, the sprung valve is designed so that if the engine is running and is no longer on choke, only a limited amount of air is drawn in. In other words it bleeds only very small amounts of air during tick over. This will reduce quite considerably the CO emissions, without impairing the smooth running of the engine.

2. At between 1500 and 3000 rpm, or after lifting-off after hard acceleration, there is much higher rate of air flow along the tee section of the device, which in turn causes a greater suction in the venturi section of the downpipe. The partial vacuum causes the valve to open against the spring pressure and air to enter in order to equalise the pressure in the tube. As pressure equalises, the valve will then return to its seating – after which the whole cycle is then repeated.

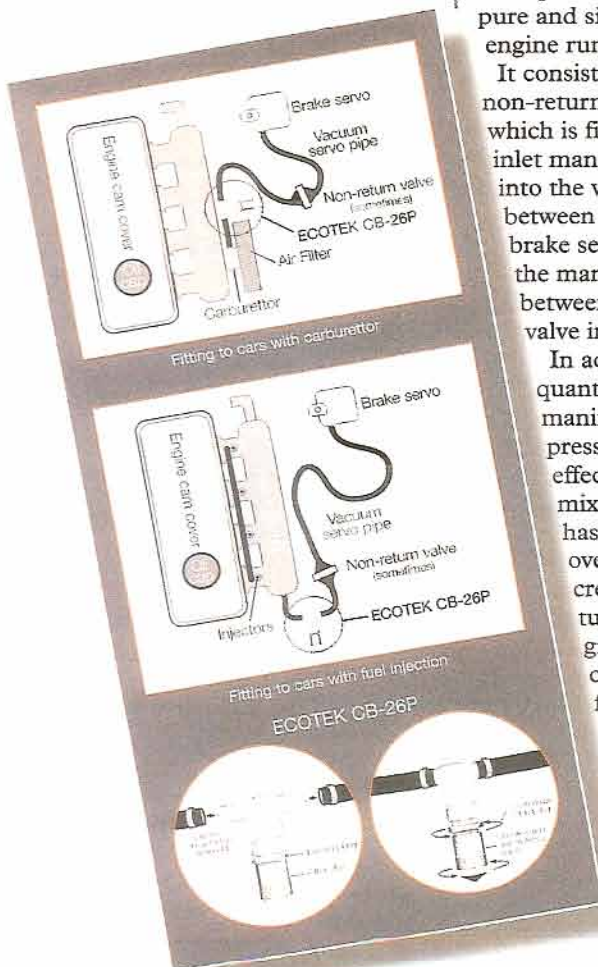
3. At very high revs, the same sequence of events continues to a greater extent, so that the valve remains open. This improves air intake to the inlet manifold, with the additional effect that air passing through the valve is caused to swirl. This creates an even greater improvement in combustion.

4. Under all circumstances, throttle response is improved all round, since the device causes the inlet vacuum to partially collapse. In the case of fuel injection vehicles with electronic engine management, the draught across the injectors is subject to slight hesitation as the accelerator is applied, together with pronounced increase in engine response.

FITTING THE ECOTEK

Unless it becomes necessary to fit directly into the manifold, installing the device is child's play (or at least, it was on my Senator). Having located the vacuum tube from the inlet manifold to the brake servo (which in the case of my car ran conveniently across the engine at the rear end), it was a matter of cutting the tube, removing a short length and fitting the ends onto the 'tee' sections on the Ecotek.

Because the Senator has a three-litre engine, two units were necessary. The manufacturer recommends using jubilee clips, to avoid any chance of an





This is the main unit, which is extremely simple to fit on most cars. Doesn't seem big enough to make such a difference!



On this Vauxhall Senator, proper fitting involved cutting this tube and reconnecting it carefully afterwards



As this Senator has a 3.0-litre engine, two separate Ecotek units are required. For cars up to 2.6 litres in capacity, one is enough



The finished job, with the Pipercross filter/silencer units added. Now for the driving test...

air leak. Four were therefore required in this case, with a very short length of tubing bridging the two units, which needed to be almost touching one another to remain effective.

We had a little difficulty getting the ends of the Ecotek to slip into the open ends of the tubing, as the fit was very tight. The tube was in an unknown grade of plastic and a small application of heat in the vicinity of the ends quickly solved the problem, enabling the tube to be pushed on far enough for it to be secured by the clips.

TUNING

Once installed, the device has to be tuned, but this, too, is a very simple operation. First, run the lock nut back on its thread until you are able to screw the unit itself into its closed position – but not too tight. Next, run the engine until it is at normal operating temperature and leave it on tickover. Now slowly unscrew the unit until there a distinct suction noise can be heard coming from it.

Now screw it slowly back until the noise stops. At this point, turn it a further ninety degrees shut. Secure it firmly in this position with the lock nut. When two units are required,

begin by shutting both units and then first tuning the one furthest from the inlet manifold. Then proceed to the second unit. When finished, the units will still tend to make some noise, but there are tiny silencers available that push over the ends of the units and are secured by plastic hose clips. Be careful when clamping these that you do not allow the complete unit to rotate and thus upset the tuning.

THE TEST: FIRST IMPRESSIONS

On the road, there was an immediate feeling of smoother take-off and much better acceleration, particularly at the bottom end – which is precisely where it is required when pulling a caravan. I had a gut feeling the consumption would be better too, although I have not yet had time to evaluate it fully.

However, you become familiar with your local terrain and get to know how the engine performs on any given incline. Even at this stage, my car felt more responsive and the overall feeling was of increased power.

The brochure accompanying the units gives reports from a number of reliable motoring sources, but I found the results of tests carried out by the Department of Trade and Industry at

their Warren Spring laboratory particularly enlightening.

A Government department has no axe to grind and we can expect this report in particular to be unbiased. I quote it verbatim, as follows:

'Reductions in emissions and petrol consumption for the Ecotek CB-26P. Hydrocarbon emissions were down by 4.8 per cent. Nitrous Oxide was down by 17.1 per cent and Carbon Dioxide down by 21 per cent, Carbon Monoxide was down by 27.9 per cent, Oxides of Nitrogen were down by 21.1 per cent and petrol consumption was down by 21.8 per cent.'

WHAT IT COSTS

The recommended retail price for the Ecotek CB-26P is £59.50 inclusive of fitting, plus VAT. For mail order and DIY fitting, the price per unit is £48.99. The Pipercross silencer unit costs £19.92 including VAT

DISTRIBUTION

Ecotek has its own network of dealers throughout the country, plus a dedicated customer helpline (tel: 01844 212939). They'll be able to inform you of your nearest outlet. Alternatively, they also have a website: www.cleanburn.co.uk

IN GEAR

THE STUFF OF MOTORING DREAMS

COST CUTTER

Countless widgets claiming to save fuel have come and gone through the years, but here's one that really works. Based around Formula One technology, Ecotek's simple CB-26P Fuel Saver creates a swirl of air that helps your engine burn petrol more efficiently – resulting in lower emissions, an improvement of up to 15% in fuel economy and a crisper, more responsive drive. Fitting takes a decent DIY-er 10 minutes, or expect a garage to install it for around £20. At £48.99 the device should quickly pay for itself. Order by phone on 01483 204 444 or online from www.ecotekplc.com

