

Technical Report

Ford - EPA
1981 Light Duty Vehicle
Diesel Correlation

By

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I. INTRODUCTION

In a letter from Ford Motor Company dated March 2, 1981, Ford requested a special correlation program with EPA. This special program would allow Ford to evaluate the sensitivity of two new diesel powered vehicles, with different engine configurations, on the Ford and EPA diesel emission measurement systems.

II. SUMMARY OF RESULTS

There are some differences between diesel gaseous and particulate results, between Ford and EPA. The results are as follows:

Average of all FTP's on Ford Escort (#313W767)

	# of Tests	HC (HFID) (-----)	CO (-----)	NOx (-----) G/mi	CO ₂ (-----)	Particulate (-----)	FE (MPG)
EPA	2	.24	.70	.74	273	.184	37.1
FORD	8	.21	.69	.74	279	.145	36.4

Average of all FTP's on Mazda Proceed Pickup (#12263)

	# of Tests	HC (HFID) (-----)	CO (-----)	NOx (-----) G/mi	CO ₂ (-----)	Particulate (-----)	FE (MPG)
EPA	2	.20	1.10	1.32	374	.325	27.1
FORD	8	.17	1.08	1.48	380	.328	26.6

III. TEST PROGRAM DESIGN

A. Test Vehicles

The following vehicles were used:

<u>Vehicle Type</u>	<u>Engine Type & Size</u>	<u>Transmission</u>	<u>Inertia Weight</u>	<u>Actual Dyno H.P.</u>
Ford Escort (Front Wheel Drive)	2.0L Toyo Kogyo Diesel	5 spd. Manual	2750 lbs.	6.7 A.H.P.
Mazda Proceed Pickup Truck	2.2L Toyo Kogyo Diesel	5 spd. Manual*	3250 lbs.	12.1 A.H.P.

* Tested as 4 speed manual only.

B. Test Procedures and Sequences

The following procedures and sequences were used at Ford and EPA on both test vehicles.

- Vehicle Delivery
- Drain Fuel
- Fuel with 40% diesel test fuel
(Diesel fuel was Phillips D-2
Special Control Fuel, supplied by Ford)
- Prep LA-4
- Soak (Minimum 11 hours)
- FTP Emission Test*
(Includes gaseous and particulates)
- Highway Fuel Economy Test
(Includes gaseous and particulates)
- 3 PAU Quick Check Coastdowns
- Add fuel to bring fuel level in vehicle to 40%
- Soak (Minimum 11 hours)

- * Gaseous analysis on the vehicles consisted of all 3 bags analyzed at the end of the FTP test.

EPA performed standard bag analysis (analysis of bags after filling per 40 CFR 86.137-78 (b) 11, 13, 18) in conjunction with the aforementioned analysis at end of FTP test. Ford also performed the same procedure, (incorporating all bag analysis at end of test with standard bag analysis) on all post-EPA testing performed at Ford.

The previous procedures and sequences were performed for two days of back-to-back testing. The dynamometer tests performed on the vehicles were used as preconditioning for the next day's sequence of tests.

IV. TEST RESULTS

All test results (gaseous and particulate) are summarized in Attachments A thru F. Attachments A and B are Lab Correlation Summaries of test results generated for both test vehicles using the standard bag analysis.

Attachments C and D are Lab Correlation Summaries of test results for both vehicles, where all the bags were analyzed at the end of each test. Also, Attachments C and D have all gaseous and particulate data (pre-EPA and post-EPA data supplied by Ford) combined, rather than performing separate Pre-EPA and Post-EPA analysis. Attachments E and F consist of Highway Fuel Economy Data for both vehicles.

Attachment G is a brief summary of all PAU quick check coast-down times (55 MPH to 45 MPH) recorded for both test vehicles.

V. DISCUSSION OF RESULTS

A. Ford Escort (Vehicle 313W767)

There appears to be no significant difference between analyzing all bags at the end of the test (See Attachment C), versus standard bag analysis (See Attachment A).

Significant percent differences may exist between Ford and EPA, where EPA measures HC (HFID) 12-17% higher, and measures particulates 16-21% higher. A high degree of confidence is lacking, however, because only two tests were performed at EPA. Therefore, to have a significant degree of confidence that an offset exists, more data (test results) would be needed from EPA.

Highway Fuel Economy Results (See Attachment E) appear to show no significant offsets in fuel economy. But there possibly is a 16% offset (with EPA measuring higher) in HC (HFID), which may reinforce that a HC (HFID) measuring offset does exist between Ford and EPA. Particulates however, reversed the offset indicated in the FTP results, which might require some investigation.

B. Mazda Proceed Pickup Truck (Vehicle #12263).

Here again, there appears to be no significant difference between analyzing all bags at the end of the test (See Attachment D), versus standard bag analysis (See Attachment B).

Significant differences may exist, where EPA measures HC (HFID) 15-18% higher than Ford, and Ford measures NOx 9-12% higher than EPA. But, in contrast to the Ford Escort, there appears to be good agreement in particulate measurement on this vehicle. Here again, to have a significant degree of confidence that an offset exists, more data (test results) would be needed from EPA. Highway Fuel Economy results (See Attachment F) appear to show a good agreement in fuel economy. The large offset in HC (HFID) is not significant, due to the low level of HC (HFID) emissions.

VI. CONCLUSIONS

The purpose of this program was outlined as a special correlation program, to allow Ford a preview of these new diesel vehicles. It is regrettable that more data could not have been generated at EPA, but due to test load and scheduling it was not possible. However, some inferences can be drawn from this program, in that some offsets in measuring HC (HFID), particulate and NOx may exist between EPA and Ford on diesel powered light duty vehicles.

LAH CORRELATION SUMMARY - TEST DATA

PROCESSED: APR 21, 1981

LAB: EPA		VEH: 79050-F0000201					VIN: 31JW767					INERTIA WTI 2750					ACTUAL MPI 6.7	
DATE	TESTNO	TYPE	MFID	CO	NOX	CO2	FE	DRIVEN	DYNO	ODOM	IMP	BARO	HUM	NAFC	PART			
03-24-81	008362	FTP	0.223	0.70	0.76	275.	36.8	36615	0007	1167.9	4.1	29.20	45.94	0.88	.209			
03-26-81	008397	FTP	0.260	0.70	0.74	271.	37.3	36615	0007	1207.1	4.1	29.14	43.88	0.87	.159			
1<----- (1.7M) -----> (MPG)																(IN-HG) (GAINS)		
																(LB)		
																(G/M3)		
MEAN			0.241	0.70	0.75	273.	37.1						29.17	44.43	0.88	.184		
STANDARD DEV.			0.0262	0.001	0.014	3.	0.4						0.040	1.442	.005	.035		
C.V.s			10.8	0.1	1.4	1.0	1.0						0.1	3.3	0.6	19.2		

LAB CORRELATION SUMMARY - TEST DATA

PROCESSED: APR 16, 1981

LAB: EPA		VEH: 79050-F0ND0281					VIN: 12263			INERTIA WT: 3250				ACTUAL MPI: 12.2	
DATE	TESTNO	TYPE	HFID	CO	NOX	CO2	FE	DRIVEN	DYNO	ODOM	IMP	BARO	HUM	NAFC	PART
03-26-81	808395	FTP	0.210	1.20	1.51	376.	26.9	36615	0007	4690.8	9.5	29.02	47.79	0.89	.356
03-27-81	808396	FTP	0.190	1.00	1.26	370.	27.3	36615	0007	4727.8	9.5	29.28	46.32	0.88	.294
(-----G/M1)----- (MPG) (IN-HG) (GMAINS /LB) (G/MI)															
MEAN		0.200 1.10 1.39 373. 27.1								29.15 47.05 0.88 .325					
STANDARD DEV.		0.041 0.141 .177 4. 0.3								0.144 1.034 .004 .044					
C.V.%		7.1 12.9 12.8 1.1 1.0								0.6 2.2 0.4 13.5					

BAG DATA

DATE	TESTNO	TYPE	DYNO	SITE	HFID	2	3	CO	2	3	NOX	2	3	CO2	2	3	FE	2	3	PART	2	3
03-26-81	808395	FTP	0007	A004	0.224	0.237	0.160	1.51	1.08	1.08	1.51	1.60	1.32	399.	381.	349.	25.3	26.6	29.0	.485	.310	.328
03-27-81	808396	FTP	0007	A004	0.200	0.207	0.161	1.26	1.00	0.97	1.25	1.31	1.16	386.	377.	345.	26.2	26.9	29.3	.350	.276	.285
(ALL G/M1)															1<--(MPG)--->1							
															(G/MI)							
MEAN					0.212	0.222	0.160	1.38	1.04	1.03	1.38	1.45	1.24	393.	379.	347.	25.8	26.8	29.1	.418	.298	.307
STANDARD DEV.					0.017	0.021	0.001	0.17	0.05	0.08	0.18	0.21	0.11	4.	3.	3.	0.6	0.2	0.2	.1	.03	.03
C.V.%					8.0	9.6	0.6	12.4	5.2	7.6	13.3	14.1	9.1	2.3	0.7	0.8	2.5	0.8	0.7	22.8	10.4	9.9

LAB: FORD		VEH: 79050-F0ND0281					VIN: 12263			INERTIA WT: 3250				ACTUAL MPI: 12.5	
DATE	TESTNO	TYPE	HFID	CO	NOX	CO2	FE	DRIVEN	DYNO	ODOM	IMP	BARO	HUM	NAFC	PART
03-31-81	20	FTP	0.174	1.03	1.49	388.	26.1	1	0014	4802.0	9.5	29.10	44.52	0.87	.322
03-31-81	23	FTP	0.171	1.10	1.52	381.	26.6	1	0014	4838.0	9.5	29.18	52.92	0.91	.318
04-01-81	26	FTP	0.146	1.13	1.50	385.	26.3	1	0014	4878.0	9.5	29.00	28.01	0.82	.324
(-----G/M1)----- (MPG) (IN-HG) (GMAINS /LB) (G/MI)															
MEAN		0.164 1.09 1.50 385. 26.3								29.09 41.82 0.87 .321					
STANDARD DEV.		0.0154 0.051 .015 4. 0.3								0.088 12.673 .044 .003					
C.V.%		9.4 4.7 1.0 0.4 1.0								0.3 30.1 5.1 1.					
DIFF. %		-18. -1. 9. 3. -3.								-0. -11. -2. -7.2					

BAG DATA

DATE	TESTNO	TYPE	DYNO	SITE	HFID	2	3	CO	2	3	NOX	2	3	CO2	2	3	FE	2	3	PART	2	3	
03-31-81	20	FTP	0014	A014	0.203	0.187	0.124	1.28	0.96	0.98	1.42	1.63	1.28	422.	388.	361.	23.4	26.0	28.0	.410	.300	.299	
03-31-81	23	FTP	0014	A014	0.179	0.190	0.130	1.33	0.99	1.15	1.49	1.62	1.36	400.	388.	353.	25.2	26.1	28.6	.403	.283	.318	
04-01-81	26	FTP	0014	A014	0.178	0.146	0.121	1.31	1.06	1.12	1.49	1.61	1.32	405.	393.	354.	24.4	25.7	28.6	.409	.289	.327	
(ALL G/M1)															(---(MPG)---)							(G/mi)	
MEAN						0.187	0.175	0.125	1.31	1.00	1.08	1.47	1.62	1.32	409.	390.	356.	24.7	25.4	28.4	.407	.291	.315
STANDARD DEV.						0.014	0.025	0.005	0.02	0.05	0.04	0.04	0.01	0.04	12.	3.	4.	0.7	0.2	0.3	.004	.01	.01
C.V.%						7.6	14.4	3.7	1.9	5.1	8.5	2.8	0.6	3.0	2.8	0.7	1.2	2.8	0.8	1.2	.9	3.	4.5
DIFF. %						-12.	-21.	-22.	-6.	-4.	5.	6.	11.	6.	4.	3.	3.	-4.	-3.	-3.	-2.6	-2.3	2.6

C.V.% IS THE COEFFICIENT OF VARIATION. (STU. DEV./MEAN *100).

DIFF. % IS THE DIFFERENCE OF THE MEANS BETWEEN THE MEH AND EPA LAB. (MPH-EPA/EPA *100).

NOTE: THE COMMENTS PERTINENT TO THESE TESTS ARE LOCATED IN THE LAST TABLE OF THIS APPENDIX.

ATTACHMENT B

Mazda Proceed Pickup FTP data analyzing each bag
after filling

LAB CORRELATION SUMMARY - TEST DATA

PROCESSED: APR 16, 1981

LAB: EPA		VEH: 74050-F0000181						VIN: 313W767			INERTIA WT: 2750				ACTUAL MPI 6.7		
DATE	TESTNO	TYPE	HF10	CO	NOX	CO2	FE	DRIVER	DYNO	ODOM	IMP	BARO	HUM	NXFC	PART		
03-24-81	80A362	FTP	0.223	0.70	0.76	275.	36.8	36615	0007	1167.9	4.1	29.20	45.99	0.88	.209		
03-26-81	80A363	FTP	0.260	0.70	0.73	271.	37.3	36615	0007	1207.1	4.1	29.14	43.88	0.87	.159		
			1<----- (G/MPI) ----->1 (MPG)						(IN-MG) (GAINS /LB)							(G/MPI)	
MEAN			0.241	0.70	0.74	273.	37.1							29.17	44.93	0.88	.184
STANDARD DEV.			0.042	0.001	0.021	3.	0.4							0.040	1.492	0.005	.085
C.V.%			10.0	0.1	2.8	1.0	1.0							0.1	3.3	0.6	19.2

BAG DATA

DATE	TESTNO	TYPE	DYNO	SITE	HF10	2	3	CO	2	3	NOX	2	3	CO2	2	3	FE	2	3	PART	2	3							
03-24-81	80B362	FTP	0007	A004	0.202	0.244	0.189	0.82	0.66	0.70	0.70	0.81	0.72	284.	280.	258.	35.6	36.2	39.2	.240	.173	.254							
03-26-81	80B363	FTP	0007	A004	0.244	0.285	0.223	0.88	0.66	0.64	0.71	0.78	0.66	287.	274.	251.	35.2	37.0	40.3	.217	.130	.170							
										(ALL G/MI)										1<--- (MPG) --->1									
																				(G/MI)									
MEAN					0.225	0.267	0.206	0.85	0.66	0.67	0.70	0.79	0.64	286.	277.	255.	35.4	36.6	39.8	.229	.152	.212							
STANDARD DEV.					0.033	0.025	0.024	0.04	0.00	0.04	0.01	0.02	0.04	2.	4.	5.	0.3	0.6	0.8	.02	.03	.06							
C.V.%					14.7	9.5	11.7	4.7	0.2	6.1	1.0	2.7	6.2	0.7	1.5	1.9	0.8	1.5	2.0	7.1	20.	28.							

LAB: FORD		VEH: 74050-F0000181						VIN: 313W767			INERTIA WT: 2750				ACTUAL MPI: 6.4				
DATE	TESTNO	TYPE	HF10	CO	NOX	CO2	FE	DRIVER	DYNO	ODOM	IMP	BARO	HUM	NXFC	PART				
03-16-81	26	FTP	0.233	0.69	0.79	300.	33.7	0	0014	883.0	4.5	29.22	18.54	0.79	.154				
03-17-81	29	FTP	0.222	0.72	0.72	280.	36.1	0	0014	915.0	4.5	28.89	24.47	0.81	.194				
03-18-81	33	FTP	0.232	0.69	0.72	272.	37.3	0	0014	954.0	4.5	28.94	17.45	0.79	.151				
03-19-81	36	FTP	0.247	0.69	0.71	273.	37.1	0	0014	984.0	4.5	28.92	17.48	0.79	.124				
03-20-81	39	FTP	0.144	0.62	0.71	273.	37.1	0	0014	1020.0	4.5	28.94	19.97	0.79	.136				
03-20-81	42	FTP	0.185	0.63	0.75	275.	36.9	0	0014	1052.0	4.5	29.07	26.25	0.81	.141				
03-30-81	48	FTP	0.222	0.60	0.80	282.	35.8	1	0014	1272.0	4.5	28.80	64.39	0.97	.162				
03-31-81	53	FTP	0.180	0.69	0.72	274.	36.9	1	0014	1329.0	4.5	29.31	37.45	0.85	.146				
1<----- (G/MPI) ----->1 (MPG)																			
(IN-MG) (GAINS /LB)																			
(6/mi)																			
MEAN			0.213	0.64	0.74	279.	36.4									29.01	28.87	0.83	.155
STANDARD DEV.			0.024	0.054	0.036	9.	1.2									0.171	17.679	0.064	.012
C.V.%			12.3	7.8	4.9	3.4	3.3									0.6	61.2	7.7	8.
DIFF. %			-12.	-1.	-1.	2.	-2.									-1.	-34.	-6.	-21.2

BAG DATA

DATE	TESTNO	TYPE	DYNO	SITE	HF10	2	3	CO	2	3	NOX	2	3	CO2	2	3	FE	2	3	PART	2	3										
03-16-81	26	FTP	0014	A014	0.220	0.264	0.175	0.85	0.67	0.62	0.74	0.85	0.69	316.	305.	280.	32.0	33.2	36.2	.221	.132	.146										
03-17-81	29	FTP	0014	A014	0.197	0.252	0.184	0.89	0.68	0.67	0.70	0.76	0.66	305.	278.	265.	33.1	36.3	38.1	.184	.128	.154										
03-18-81	33	FTP	0014	A014	0.204	0.242	0.193	0.85	0.65	0.64	0.70	0.77	0.63	291.	274.	254.	34.7	37.0	39.4	.203	.131	.149										
03-19-81	36	FTP	0014	A014	0.215	0.255	0.202	0.74	0.68	0.63	0.68	0.77	0.63	285.	277.	255.	35.5	36.4	39.6	.150	.111	.130										
03-20-81	39	FTP	0014	A014	0.154	0.212	0.144	0.78	0.59	0.55	0.69	0.75	0.63	295.	274.	254.	34.2	37.0	40.0	.145	.119	.147										
03-20-81	42	FTP	0014	A014	0.144	0.222	0.145	0.73	0.64	0.56	0.73	0.80	0.66	303.	274.	256.	33.5	36.4	39.6	.163	.134	.139										
03-30-81	48	FTP	0014	A014	0.198	0.261	0.168	1.04	0.73	0.74	0.76	0.86	0.70	296.	288.	261.	34.2	35.2	38.5	.249	.119	.162										
03-31-81	53	FTP	0014	A014	0.172	0.193	0.163	0.80	0.68	0.64	0.71	0.78	0.63	298.	275.	254.	34.0	36.7	39.6	.202	.121	.150										
(ALL G/MPI)																							1<--- (MPG) --->1									
MEAN					0.190	0.244	0.172	0.84	0.66	0.63	0.71	0.79	0.65	299.	281.	260.	33.9	36.1	38.9	.195	.124	.147										
STANDARD DEV.					0.027	0.032	0.020	0.10	0.04	0.06	0.03	0.04	0.03	9.	11.	9.	1.1	1.3	1.3	.04	.008	.01										
C.V.%					14.0	13.0	11.7	11.4	5.9	9.7	3.8	5.2	4.4	3.2	3.9	3.5	3.1	3.6	3.3	19.7	6.4	6.5										
DIFF. %					-16.	-8.	-16.	-1.	0.	-6.	1.	-0.	-5.	5.	1.	2.	-4.	-1.	-2.	-14.8	-18.4	-30.7										

LAB CORRELATION SUMMARY - TEST DATA

PROCESSED: APR 16, 1981

LAB: EPA		VEH: 7905D-FUHD0181										VINI 12263				INERTIA WT: 3250				ACTUAL MPI 18.2	
DATE	TESTNO	TYPE	MFID	CO	NOX	CO2	FE	DRIVER	DYNO	ODOM	IMP	BARO	HUM	NAFC	PART						
03-26-81	808334	FTP	0.210	1.20	1.51	377.	26.8	36615	D007	4690.8	9.5	29.02	47.79	0.89	.356						
03-27-81	808335	FTP	0.190	1.00	1.13	370.	27.3	36615	D007	4727.8	9.5	29.28	46.32	0.88	.294						
			14----- (G/MPI)-----> (MPG)										(IN-HG) (GRAINS /LB)				(G/mi)				
MEAN			0.200	1.10	1.32	374.	27.1					29.15	47.05	0.88	.325						
STANDARD DEV.			0.014	0.141	.264	5.	0.4					0.184	1.039	.004	.044						
C.V.%			7.1	12.9	20.4	1.3	1.3					0.6	2.2	0.4	13.5						

BAG DATA

DATE	TESTNO	TYPE	DYNO	SITE	MFID	2	3	CO	2	3	NOX	2	3	CO2	2	3	FE	2	3	PART	2	3
03-26-81	808334	FTP	0007	A004	0.224	0.237	0.160	1.49	1.08	1.08	1.52	1.61	1.32	400.	382.	349.	25.3	26.5	29.0	.485	.320	.328
03-27-81	808335	FTP	0007	A004	0.200	0.207	0.161	1.26	1.00	0.97	0.97	1.18	1.16	385.	378.	345.	26.3	26.8	29.3	.350	.278	.285
														(ALL G/MPI)				14----- (MPG)----->1		(G/mi)		
MEAN					0.212	0.222	0.160	1.37	1.04	1.03	1.24	1.39	1.24	393.	380.	347.	25.8	26.6	29.1	.418	.298	.307
STANDARD DEV.					0.017	0.021	0.001	0.17	0.05	0.08	0.39	0.30	0.11	11.	3.	3.	0.7	0.2	0.2	.1	.03	.03
C.V.%					8.0	9.6	0.4	12.2	5.2	7.6	31.2	21.8	9.1	2.7	0.7	0.8	2.7	0.8	0.7	22.8	10.4	9.9

LAB: FORD		VEH: 7905D-FURD0181										VINI 12263				INERTIA WT: 3250				ACTUAL MPI 12.5	
DATE	TESTNO	TYPE	MFID	CO	NOX	CO2	FE	DRIVER	DYNO	ODOM	IMP	BARO	HUM	NAFC	PART						
03-16-81	1	FTP	0.175	0.96	1.52	375.	26.9	1	0014	4390.0	9.5	29.20	14.99	0.78	.351						
03-17-81	4	FTP	0.176	1.16	1.46	372.	27.2	1	0014	4448.0	9.5	28.73	25.32	0.81	.330						
03-18-81	7	FTP	0.180	1.02	1.41	371.	27.2	0	0014	4470.0	9.5	28.93	17.45	0.79	.338						
03-19-81	13	FTP	0.170	1.14	1.48	380.	26.6	0	0014	4544.0	9.5	28.96	33.02	0.84	.324						
03-20-81	16	FTP	0.162	1.05	1.47	381.	26.5	0	0014	4582.0	9.5	28.94	28.14	0.82	.312						
03-31-81	20	FTP	0.174	1.03	1.48	390.	25.9	1	0014	4802.0	9.5	29.12	44.49	0.87	.322						
03-31-81	23	FTP	0.171	1.11	1.51	384.	26.3	1	0014	4838.0	9.5	29.18	52.92	0.91	.318						
04-01-81	26	FTP	0.146	1.15	1.49	383.	26.4	1	0014	4878.0	9.5	29.00	28.04	0.82	.324						
			14----- (G/MPI)----->1 (MPG)										(IN-HG) (GRAINS /LB)				(G/mi)				
MEAN			0.169	1.08	1.48	380.	26.6					29.01	30.55	0.83	.328						
STANDARD DEV.			0.018	0.072	.034	6.	0.5					0.152	12.840	.043	.018						
C.V.%			0.4	6.6	2.3	1.7	1.7					0.5	42.0	5.1	5.8						
DIFF. %			-15.	-2.	12.	2.	-2.					-0.	-35.	-6.	.92						

BAG DATA

DATE	TESTNO	TYPE	DYNO	SITE	MFID	2	3	CO	2	3	NOX	2	3	CO2	2	3	FE	2	3	PART	2	3
03-16-81	1	FTP	0014	A014	0.183	0.196	0.131	1.13	0.93	0.91	1.59	1.56	1.37	406.	377.	350.	24.9	26.9	29.0	.545	.299	.305
03-17-81	4	FTP	0014	A014	0.172	0.200	0.136	1.34	1.11	1.13	1.45	1.51	1.37	399.	371.	352.	25.3	27.3	28.7	.406	.313	.303
03-18-81	7	FTP	0014	A014	0.184	0.207	0.127	1.20	0.99	0.93	1.35	1.54	1.21	391.	375.	349.	25.4	26.4	29.0	.436	.325	.287
03-19-81	13	FTP	0014	A014	0.163	0.197	0.123	1.45	1.09	1.02	1.37	1.63	1.28	400.	387.	353.	25.2	26.1	28.7	.408	.308	.291
03-20-81	16	FTP	0014	A014	0.166	0.184	0.119	1.27	0.96	1.02	1.45	1.56	1.32	401.	386.	356.	25.2	26.2	28.4	.424	.270	.298
03-31-81	20	FTP	0014	A014	0.203	0.189	0.124	1.28	0.98	0.96	1.40	1.62	1.27	414.	394.	360.	24.1	25.6	28.0	.410	.300	.299
03-31-81	23	FTP	0014	A014	0.179	0.190	0.130	1.33	1.01	1.13	1.48	1.60	1.36	403.	392.	354.	25.1	25.8	28.4	.403	.283	.318
04-01-81	26	FTP	0014	A014	0.178	0.146	0.121	1.35	1.08	1.13	1.47	1.59	1.32	402.	392.	352.	25.1	25.8	28.7	.409	.289	.327
														(ALL G/MPI)				14----- (MPG)----->1		(G/mi)		
MEAN					0.178	0.189	0.126	1.29	1.02	1.03	1.44	1.58	1.31	403.	384.	353.	25.1	26.3	28.6	.430	.298	.305
STANDARD DEV.					0.012	0.019	0.008	0.10	0.07	0.09	0.08	0.04	0.06	8.	9.	3.	0.5	0.6	0.3	.05	.02	.01
C.V.%					7.0	9.9	4.5	7.6	6.5	8.8	5.2	2.6	4.3	2.0	2.3	1.0	2.0	2.4	1.2	11.1	6.7	4.3
DIFF. %					-16.	-15.	-21.	-6.	-2.	1.	16.	13.	6.	3.	1.	2.	-3.	-1.	-2.	2.9	0	-7

C.V.% IS THE COEFFICIENT OF VARIATION. (STD. DEV./MEAN *100).
 DIFF. % IS THE DIFFERENCE OF THE MEANS BETWEEN THE MFH AND EPA LAB. (MFH-EPA/EPA *100).
 NOTE: THE COMMENTS PERTINENT TO THESE TESTS ARE LOCATED IN THE LAST TABLE OF THIS APPENDIX.

ATTACHMENT D

Mazda Proceed Pickup FTP data performing all bag analysis at end of test.

LAB CORRELATION SUMMARY - TEST DATA

PROCESSED: APR 16, 1981

LAB: EPA VEH: 7905D-FORDD181 VIN: 313W767 INERTIA WT: 2750 ACTUAL HP: 6.7

DATE	TESTNO	TYPE	HFID	CO	NOX	CO2	FE DRIVER	DYNO	ODOM	IHP	BARO	HUM	NXFC	PART	
03-24-81	808364-1	HFET	0.158	0.36	0.55	197.	51.5	36615	D007	1177.5	4.1	29.20	47.38	0.89	.101
03-26-81	808365-1	HFET	0.164	0.38	0.54	197.	51.4	36615	D007	1216.6	4.1	29.08	47.71	0.89	.101
<----- (G/MI) -----> (MPG) (IN-HG) (GRAINS /LB) (G/MI)															
MEAN			0.161	0.37	0.54	197.	51.4				29.14	47.54	0.89	.101	
STANDARD DEV.			.0042	0.014	.007	0.	0.1				0.084	0.234	.001	---	
C.V.%			2.6	3.4	1.3	0.0	0.1				0.3	0.5	0.2	---	

LAB CORRELATION SUMMARY - TEST DATA

PROCESSED: APR 16, 1981

LAB: FORD VEH: 7905D-FORDD181 VIN: 313W767 INERTIA WT: 2750 ACTUAL HP: 6.9

DATE	TESTNO	TYPE	HFID	CO	NOX	CO2	FE DRIVER	DYNO	ODOM	IHP	BARO	HUM	NXFC	PART	
03-16-81	27-1	HFET	0.133	0.41	0.54	204.	49.8	0	D014	892.0	4.5	29.23	16.90	0.79	.106
03-17-81	30-1	HFET	0.140	0.43	0.54	211.	48.1	0	D014	923.0	4.5	28.93	26.54	0.81	.113
03-18-81	34-1	HFET	0.141	0.39	0.50	200.	50.6	0	D014	963.0	4.5	28.96	15.41	0.78	.100
03-19-81	37-1	HFET	0.147	0.42	0.51	198.	51.1	0	D014	994.0	4.5	28.91	17.48	0.79	.100
03-20-81	40-1	HFET	0.131	0.38	0.54	194.	52.4	0	D014	1030.0	4.5	28.94	21.11	0.80	.109
03-20-81	43-1	HFET	0.132	0.37	0.55	197.	51.6	0	D014	1063.0	4.5	29.11	26.16	0.81	.117
03-23-81	46-1	HFET	0.129	0.38	0.54	198.	51.3	0	D014	1118.0	4.5	29.47	25.45	0.81	.117
03-30-81	49-1	HFET	0.137	0.40	0.60	200.	50.8	1	D014	1282.0	4.5	28.82	64.62	0.95	.112
03-31-81	54-1	HFET	0.129	0.40	0.55	198.	51.1	1	D014	1339.0	4.5	29.32	43.15	0.87	.126
<----- (G/MI) -----> (MPG) (IN-HG) (GRAINS /LB) (G/MI)															
MEAN			0.135	0.40	0.54	200.	50.8				29.08	28.54	0.82	.111	
STANDARD DEV.			.0062	0.020	.028	5.	1.2				0.217	15.890	.055	.008	
C.V.%			4.6	5.0	5.2	2.5	2.4				0.7	55.7	6.7	7.6	
DIFF. %			-16.	9.	-1.	2.	-1.				-0.	-40.	-7.	9.9	

ATTACHMENT E

Ford Escort Highway Fuel Economy Data

LAB CORRELATION SUMMARY - TEST DATA

PROCESSED: APR 16, 1981

LAB: EPA VEH: 7905U-FORD0181 VIN: 12263 INERTIA WT: 3250 ACTUAL HP: 12.2

DATE	TESTNO	TYPE	HFID	CO	NOX	CO2	FE DRIVER	DYNO	ODOM	IHP	BARO	HUM	NXFC	PART	
03-26-81	808336-1	HFET	0.109	0.58	1.24	280.	36.2	36615	D007	4702.5	9.5	29.02	51.75	0.90	.244
03-27-81	808337-1	HFET	0.090	0.54	1.03	283.	35.9	36615	D007	4739.3	9.5	29.31	44.13	0.87	.214
			<----- (G/MI) ----->				(MPG)					(IN-HG)	(GRAINS /LB)		(G/MI)

MEAN	0.100	0.56	1.13	282.	36.0					29.16	47.94	0.89	.229
STANDARD DEV.	.0134	0.029	.148	2.	0.2					0.205	5.388	.020	.021
C.V.%	13.5	5.2	13.1	0.8	0.6					0.7	11.2	2.2	9.26

LAB CORRELATION SUMMARY - TEST DATA

PROCESSED: APR 16, 1981

LAB: FUPD VEH: 7905U-FORD0181 VIN: 12263 INERTIA WT: 3250 ACTUAL HP: 12.5

DATE	TESTNO	TYPE	HFID	CO	NOX	CO2	FE DRIVER	DYNO	ODOM	IHP	BARO	HUM	NXFC	PART	
03-16-81	2-1	HFET	0.064	0.43	0.94	267.	37.9	0	D014	4398.0	9.5	29.16	15.06	0.78	.175
03-17-81	5-1	HFET	0.076	0.58	1.21	284.	35.6	0	D014	4443.0	9.5	28.86	24.54	0.81	.239
03-18-81	8-1	HFET	0.070	0.45	0.95	270.	37.7	0	D014	4481.0	9.5	28.93	17.45	0.79	.173
03-19-81	11-1	HFET	0.087	0.60	1.15	279.	36.3	0	D014	4519.0	9.5	28.93	22.77	0.80	.248
03-19-81	14-1	HFET	0.084	0.57	1.16	282.	36.0	0	D014	4555.0	9.5	28.95	21.11	0.80	.237
03-20-81	17-1	HFET	0.077	0.57	1.80	276.	36.8	0	D014	4593.0	9.5	28.94	123.92	1.30	.234
03-20-81	19-1	HFET	0.060	0.39	0.91	271.	37.4	0	D014	4615.0	9.5	28.96	24.83	0.81	.134
03-31-81	21-1	HFET	0.064	0.42	1.03	276.	36.7	1	D014	4814.0	9.5	29.18	45.99	0.88	.170
03-31-81	24-1	HFET	0.068	0.55	1.28	281.	36.2	1	D014	4838.0	9.5	29.15	53.00	0.91	.237
04-01-81	27-1	HFET	0.080	0.59	1.16	281.	36.0	1	D014	4889.0	9.5	29.00	28.04	0.82	.226
			<----- (G/MI) ----->				(MPG)					(IN-HG)	(GRAINS /LB)		(G/MI)

MEAN	0.073	0.52	1.16	277.	36.7					29.01	37.67	0.87	.208
STANDARD DEV.	.0092	0.081	.258	6.	0.8					0.112	32.642	.156	.040
C.V.%	12.6	15.7	22.2	2.1	2.1					0.4	86.7	18.0	19.3
DIFF. %	-27.	-8.	2.	-2.	2.					-1.	-21.	-2.	9.2

ATTACHMENT F

Mazda Proceed Pickup Highway Fuel Economy Data

PAU Quick Check Coastdown Times

Ford Escort #313 W 767

	Pre-EPA * Ford Site <u>14</u>	EPA Site * <u>07</u>	Post-EPA * Ford Site <u>14</u>
	14.00	13.96	14.02
	14.10	14.02	13.81
	14.16		
	14.00		
	14.35		
	14.00		
$\bar{x}$	14.10	13.99	13.92

Mazda Proceed Pickup #12263

	Pre-EPA * Ford Site <u>14</u>	EPA Site * <u>07</u>	Post-EPA * Ford Site <u>14</u>
	12.79	12.43	12.39
	12.69	12.38	12.61
	12.84		12.65
	12.69		
	12.44		
$\bar{x}$	12.69	12.41	12.55

* The above coastdown times are averages of 3 consecutive coastdowns.