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Unregulated Exhaust Emissions from Non-Catalyst Baseline Cars Under Malfunction Conditions

Unregulated Exhaust Emissions from Non-Catalyst Baseline Cars Under Malfunction Conditions

by

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FOREWORD

These project tasks were initiated by the Control Technology Assessment and Characterization Branch, Environmental Protection Agency, 2565 Plymouth Road, Ann Arbor, Michigan 48105. The engineering and analytical effort on which this report is based was accomplished by the Department of Emissions Research of Southwest Research Institute, 6220 Culebra Road, San Antonio, Texas 78284. These project tasks, authorized by Task Specifications 4 and 5 under Contract 68-03-2884, were initiated on June 13, 1980 and August 19, 1980 and were completed on March 4, 1981. The project under which these tasks were conducted was identified within Southwest Research Institute as Project 05-5830.

The SwRI Project Leader was Mr. Charles Urban, who supervised all vehicle testing, data analyses and reporting. Dr. Lawrence Smith was in charge of the unregulated emissions procedural development-related activities that were involved in this project. Mr. Charles Hare was Project Manager and was involved in the initial technical and fiscal negotiations and subsequent major project decisions.

The Project Officer throughout the project was Mr. Robert Garbe of the Control Technology Assessment and Characterization Branch, Environmental Protection Agency. The EPA Task Branch Technical Representative was Ms. Colleen DeMeyer. Mr. Frank Black and members of his staff, of the Environmental Protection Agency at Research Triangle Park in North Carolina, conducted the elemental analyses.

ABSTRACT

This report describes the laboratory effort to characterize regulated and unregulated exhaust emissions from 1970 model non-catalyst gasoline automobiles operating under malfunction conditions. Four automobiles were evaluated over three driving schedules in the unmodified configuration and in up to three engine and/or emission control system malfunction configurations. Exhaust emission constituents measured, in addition to the currently regulated emissions, include: particulates, sulfates, aldehydes, sulfides, amines, metals and several additional elements and compounds. Additional evaluations, in each of the configurations, involved the measurement of the regulated emissions over four short-test procedures.

SUMMARY

The major objective of these project tasks was to study exhaust emissions for non-catalyst gasoline automobiles, operating under malfunction conditions. These evaluations involved analyzing the exhaust for many unregulated compounds and elements in addition to the currently regulated emissions.

This study involved four 1970 model automobiles: an Oldsmobile Delta 88, a Dodge Challenger, a Chevrolet Monte Carlo, and a Ford Fairlane. Each automobile was evaluated in the unmodified (tuned-up to manufacturer's specifications) and in up to three different malfunction configurations. Malfunction conditions evaluated were rich idle, twelve percent ignition misfire, and lean idle.

Unregulated emission compounds measured included: sulfates, particulates, metals and other elements, aldehydes, cyanides, sulfides, organic amines, ammonia, and leaded fuel compounds. A number of analytical procedures for these compounds were developed specifically for use in previous projects. The analysis method for leaded fuel compounds was assembled, specifically for use in this study, using the procedure obtained from the EPA at RTP.

The three primary test sequences involved in this project were the light-duty Federal Test Procedure (FTP), the congested freeway driving schedule and the highway fuel economy driving schedule. In addition, the regulated emissions were evaluated over four steady-state procedures. The basic requirements specified in the Code of Federal Regulations for certification of light-duty vehicles were followed for the three primary test sequences.

A significant data base on the cars evaluated, for both regulated and unregulated emissions, was generated in this project. These data were analyzed to the extent applicable and are presented in several different formats to facilitate their review and usage. The FTP overall average values, for the unmodified configuration, and the highest values detected, for any of the configurations evaluated, are summarized as follows:

<u>Emission</u>	<u>Emission Rate, mg/km</u>	
	<u>Average in Unmodified Configuration</u>	<u>Maximum in Any Configuration</u>
Hydrocarbons	1,900	15,200
Carbon Monoxide	17,100	59,000
Oxides of Nitrogen	2,600	3,700
Total Particulates	99	222
Aldehydes & Ketones	37	255
Sulfate	<1	3
Cyanide & Cyanogen	3	10
Ammonia	4	17
Hydrogen Sulfide	<1	<1
Organic Sulfides	<1	<1
Organic Amines	<1	<1

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I. INTRODUCTION

This report describes the effort to characterize regulated and unregulated exhaust emissions from four 1970 model gasoline automobiles operating in the unmodified and under malfunction conditions. This is the fifth project to be completed from among several related projects at SwRI involving the evaluation of a large number of unregulated emissions from gasoline automobiles. The initial projects involved evaluation of late model non-catalyst, oxidation catalyst and three-way catalyst gasoline automobiles.(1,2,3,4)*

A. Project Objective

The major objective of this project was to evaluate the effects of engine malfunction conditions on exhaust emissions from pre-catalyst gasoline automobiles. Emissions evaluated include the three currently regulated emissions (HC, CO, and NO_x) along with a significant number of currently unregulated compounds (e.g., sulfates, sulfides, aldehydes, amines, etc.).

B. Emissions Measurement Procedures

The compounds or compound groups evaluated, along with the sampling methods used, were as follows:

<u>Sampling Method</u>	<u>Compounds Evaluated</u>
Bag	HC, CO, NO _x , CO ₂ , Individual HC, and Leaded Fuel Components
Filter	Sulfates, Particulates, Metals, and Other Elements
Impinger	Cyanides, Aldehydes, Hydrogen Sulfide, Ammonia and Organic Amines
Trap	Carbonyl and Organic Sulfides.

A number of the procedures for measuring unregulated emissions were developed in another project and reported in a widely distributed interim report.⁽⁵⁾

C. Vehicles Evaluated

Four 1970 model automobiles were evaluated in this project. Included were a Chevrolet Monte Carlo, a Dodge Challenger, a Ford Fairlane, and an Oldsmobile Delta 88. Compared to uncontrolled automobiles, emission controls on these cars involved positive crankcase ventilation, engine modifications, and some spark and air/fuel calibration changes. These automobiles, which

*Superscript numbers in parentheses designate references at end of the report.

were provided by the manufacturers through the EPA, had previously undergone testing in a baseline emissions program.

D. Malfunction Conditions Evaluated

Malfunction conditions included: rich idle, 12 percent ignition misfire and lean idle. The rich idle condition involved adjusting to the idle mixture producing highest engine speed at idle. The 12 percent ignition misfire condition was obtained using an essentially random misfire generator that was fabricated and used in previous projects. Lean idle involved an idle mixture at which lean misfire remained barely acceptable.

E. Vehicle Testing

The automobiles involved in this study were tested in the unmodified configuration (i.e., tuned-up to manufacturer's specifications) and in up to three malfunction conditions. The test sequence included the Light-Duty Federal Test Procedure (FTP)⁽⁶⁾, the Congested Freeway Driving Schedule (SET)⁽⁷⁾, and the Highway Fuel Economy Driving Schedule (HFET).⁽⁸⁾ To the extent practical, all specified unregulated exhaust constituents were sampled and analyzed during every test. In addition, HC and CO emissions were measured in each configuration using three short-test procedures.

II. GENERAL EQUIPMENT, INSTRUMENTS, PREPARATION AND PROCEDURES

This section describes the automobiles, the fuel and lubricant, the facilities and the general instrumentation and procedures utilized in this project. The overall sampling systems for the unregulated emissions are also discussed.

A. Automobiles

Four 1970 model gasoline-powered automobiles were evaluated in this project. These automobiles (cars), which were provided by the manufacturers through the EPA, are described in Table 1. Prior to use in this project, these cars had undergone evaluations in a baseline emissions program.

B. Fuel and Lubricant

The fuel used in this project was a leaded gasoline obtained from Howell Refinery. Properties of this gasoline, along with national average values for 1970, are given in Table 2. The SwRI identification number of this leaded gasoline was EM-433. Selection of this fuel was based on its availability, along with its having reasonably acceptable properties.

The engine lubricant used was Quaker State 10W-40 Deluxe. This motor oil has a significant sales volume and met the car manufacturers' recommendations for 1970 cars.

C. Dynamometer and CVS System

A Clayton Model ECE-50 chassis dynamometer with a belt-driven variable-inertia flywheel system, was utilized for all transient testing. This belt-driven inertia system simulates equivalent weight of vehicles from 680 kg (1500 lbs) to 2495 kg (5500 lbs), in 115 kg (250 lbs) increments to 1360 kg, and in 225 kg increments above 1360 kg.

The constant volume sampler (CVS) used for these evaluations was SwRI CVS Number 2. This unit has a nominal capacity of $9.2 \text{ m}^3/\text{min}$ (325 cfm). A nominal 460 mm (18 inch) diameter by 5 m (16 feet) long dilution tunnel was used between the intake filter and the CVS to enable sampling of sulfates and particulates.

Partial views of the chassis dynamometer, the dilution tunnel and the intake to the CVS can be seen in subsequent Figure 2. Both the dynamometer and the CVS were calibrated, maintained and operated in accordance with the manufacturer's instructions and the appropriate sections of the Code of Federal Regulations applicable to light-duty vehicles.⁽⁶⁾

In addition to the $142 \text{ m}^3/\text{min}$ (5000 cfm) cooling fan placed in front of the automobile, $42 \text{ m}^3/\text{min}$ (1500 cfm) blowers were available to cool each rear wheel. These additional blowers were used only during the SET and HFET driving cycles.

TABLE 1. AUTOMOBILES EVALUATED

Project Car Number	Automobiles				
	<u>Year</u>	<u>Make</u>	<u>Model</u>	<u>Body Type</u>	<u>ID or Serial Number</u>
71	1970	Oldsmobile	Delta 88	4-dr	354690X133744
72	1970	Dodge	Challenger	2-dr	JH23COE137160
73	1970	Chevrolet	Monte Carlo	2-dr	138570F182620
74	1970	Ford	Fairlane	2-dr	FOA29F27235F

Project Car Number	Engine CID/Cyl	Emission Controls		Transmission, Type/Gears	Accessories
		<u>PCV</u>	<u>Other^a</u>		
71	455/8	Yes	ND	Automatic/3	PS, PB & AC
72	225/6	Yes	ND	Manual/3	None
73	350/8	Yes	ND	Automatic/3	PS, PB & AC
74	302/8	Yes	ND	Automatic/3	PS & AC

Project Car Number	Chassis Dynamometer Settings ^b			
	<u>Inertia, Kilograms</u>	<u>Power, Kilowatts</u>	<u>Inertia, Pounds</u>	<u>Power, Horsepower</u>
71	2040	9.5	4500	12.7
72	1590	8.4	3500	11.2
73	1810	8.9	4000	12.0
74	1810	8.9	4000	12.0

^a No other emission controls were apparent.

^b Dynamometer inertia and power settings were obtained from the EPA Project Officer.

TABLE 2. DESCRIPTION OF EM-433 LEADED GASOLINE

	<u>EM-433</u>	Bureau of Mines Summer <u>1970 Average</u>
Specific Gravity, at 60°F	0.740	0.735
Reid Vapor Pressure, psi	7.9	9.1
Research Octane No.	92.0	93.8
Lead, g/Gal.	1.64	2.43
Sulfur, wt%	0.022	0.042
<u>Distillation, °F</u> <u>(% Evaporated)</u>		
IBP	95	93
10%	130	123
50%	207	207
90%	310	339
EP	357	410
<u>Hydrocarbons, Vol. %</u>		
Aromatics	29.8	--
Olefins	1.0	--
Saturates	69.2	--

D. Exhaust Sampling and Analysis

A pictorial schematic of the exhaust and sampling system is shown in Figure 1. This system is in accordance with the guidelines established in previous unregulated emissions projects conducted at SwRI for the EPA. A primary feature of this system is the number of sampling probes and collection units required to collect all of the required unregulated emission samples. This is illustrated in the several views of the system shown in Figure 2.

This section has described the dilution tunnel and provided some insight into the overall sampling system assembly. More details on each of the individual sampling systems for the unregulated emissions are given in Section III of this final report.

E. Instrumentation for Regulated Emissions and Engine Parameters

Bagged samples of the dilute exhaust were evaluated for HC, CO, NO_x, and CO₂ using SwRI Bag Cart Number 1. This bag cart was designed, calibrated and operated in accordance with the appropriate sections of the Code of Federal Regulations applicable to light-duty vehicles.⁽⁶⁾ In addition, the vehicle speed and the oxygen level in the undiluted exhaust were continuously recorded. The instrumentation used for these continuously recorded data were as follows:

<u>Parameter Measured</u>	<u>Instrument or Method</u>		
	<u>Type</u>	<u>Make & Model</u>	<u>Ranges Used</u>
O ₂	Polarographic	Beckman 715	5 & 25%
Speed	--- Analog output from the Dynamometer Controls ---		

The average oxygen level in the undiluted exhaust was obtained by integration of the continuous oxygen signal, using an Acromag 1324-LY-1 integrator. The average oxygen level has only a gross relative meaning for most of these evaluations. Oftentimes, the oxygen level was relatively high when the exhaust flow was low (e.g., idle and cut-throttle) and relatively low when the exhaust flow was relatively high (e.g., highway speed). The integration of the oxygen in the undiluted exhaust does not compensate for these changes in exhaust flow. It is possible to have a significant average oxygen level and yet be deficient in oxygen over some portions of the driving cycle. Therefore, the average oxygen level serves only as a general indicator of the malfunction condition (e.g., average oxygen level decreases somewhat for rich operation).

F. Emissions Test Procedures

The primary procedures and driving schedules utilized in this project are defined as follows:

FTP - 1979 Federal Test Procedure ⁽⁶⁾
(uses the Urban Dynamometer Driving Schedule)

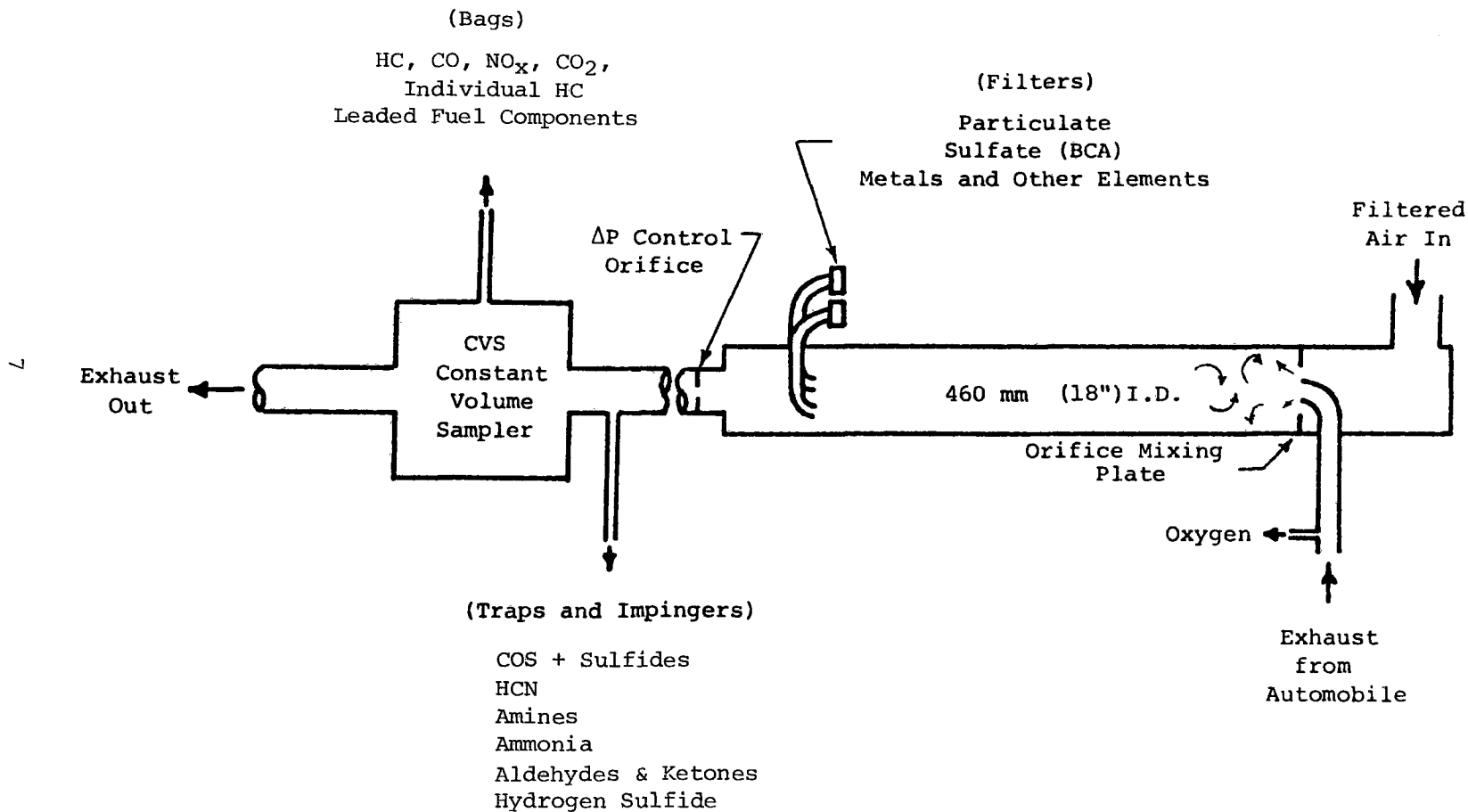
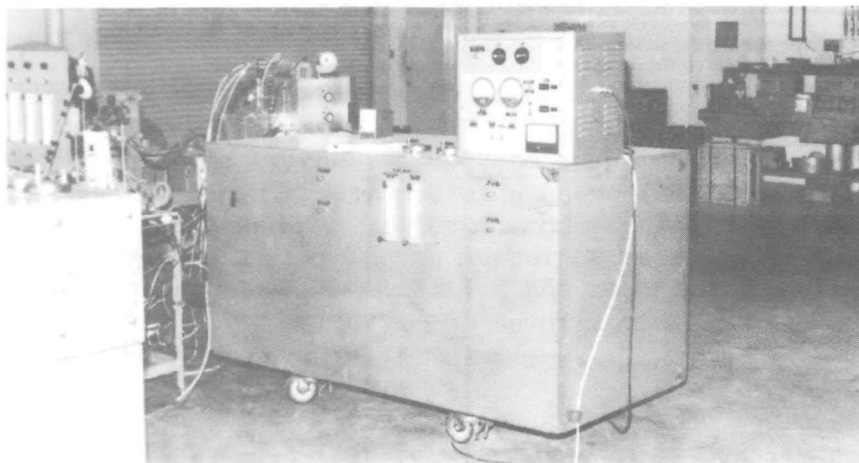
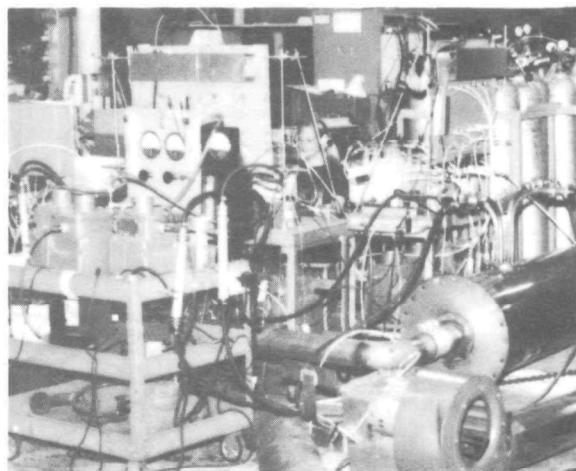
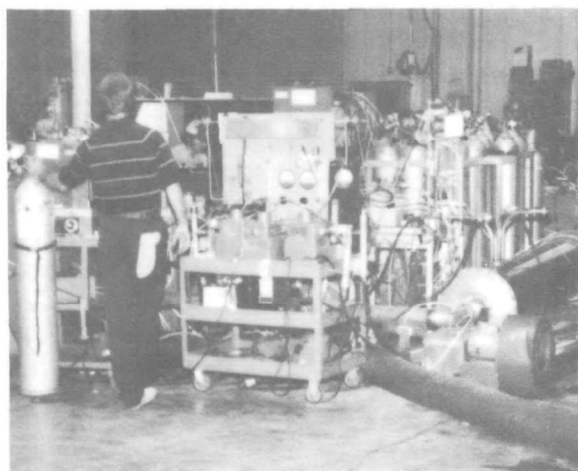


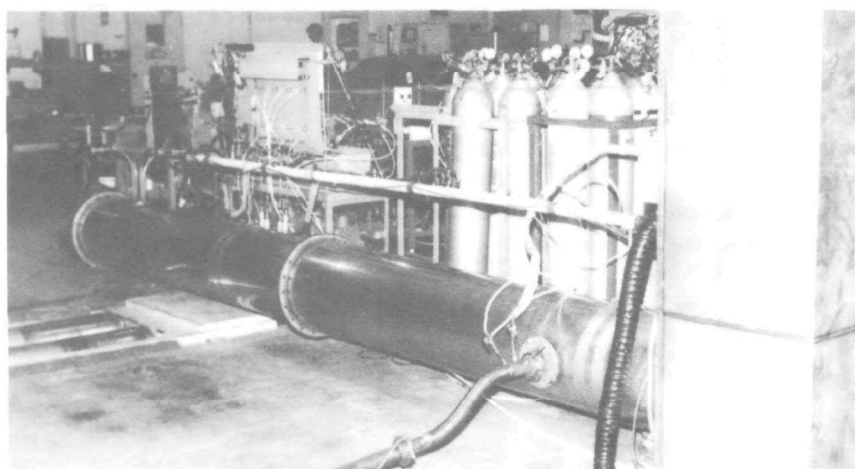
Figure 1. Gasoline engine emissions sampling system



A. CVS Side of the System



B. Front Views of System



C. Dynamometer Side of System

Figure 2. Views of the emissions sampling system

SET - Congested Freeway Driving Schedule⁽⁷⁾

HFET - Highway Fuel Economy Driving Schedule⁽⁸⁾

Each of the three primary procedures and schedules, requiring emissions testing in this project (FTP, SET, and HFET), utilized bagged samples for evaluation of regulated emissions and fuel consumption. In addition, evaluation of the regulated emissions was conducted using several short-test procedures. These short-test procedures are discussed in Section II.H.

The SET and the HFET are both hot-start, single-segment driving cycles. The FTP, however, involves cold-start and hot-start, multi-cycle with multi-segment operation. In addition, in this project a four-bag FTP was utilized for most of the unregulated emissions; rather than the three-bag FTP specified in the Federal Test Procedure. Therefore, before proceeding, it is important to clarify the meaning of FTP as used in this project.

FTP - The FTP uses the Urban Dynamometer Driving Schedule (UDDS) which is 1372 seconds in duration. The UDDS, in turn, is divided into two segments: a "transient" phase of 505 seconds and a "stabilized" phase of 867 seconds. The 1975 Federal Test Procedure consists of cold start "transient" and "stabilized" phases, followed by a hot start "transient." In this project, the hot start "transient" was followed by a hot start "stabilized." For the remainder of this discussion, and throughout this report, the four-cycle FTP will be identified as presented in Table 3. Therefore, with the assumption that any changes in distance traveled are negligible, the composite results with the four-cycle FTP relative to results with the three-cycle FTP will differ only as the mass emissions emitted during Cycle 4 differ from that emitted during Cycle 2. For the regulated emissions, the differences during cycles 2 and 4 were small, and the overall effects of such differences were essentially negligible.

The test sequence followed for each automobile is given in Table 4. Sequences 1 through 9 were repeated for each malfunction condition evaluated on each automobile. The sequence followed in the laboratory for running one set of emissions tests (FTP, SET and HFET) is given in Table 5.

The parameters of the three primary driving schedules are summarized in Table 6 and these schedules are illustrated in Figure 3. Other driving schedule designations frequently used are as follows:

<u>Driving Schedule Designation Used</u>	<u>Other Common Designations</u>
FTP	LA-4 and UDDS
SET	CFDS and SET-7
HFET	FET

TABLE 3. DESCRIPTION OF FOUR-CYCLE FTP

	Four-Cycle FTP			
	Cold UDDS		Hot	UDDS
Cycle	1	2	3	4
Duration, seconds	505	867	505	867
Regulated Emissions, 3-Bag	X	X	X	
Regulated Emissions, 4-Bag	X	X	X	X
Unregulated Emissions:				
Bag	X	X	X	X
Impinger	---	X---	---	X---
Trap	---	X---	---	X---

NOTE: X designates a sample taken

A composite value in mass per distance for the three-cycle, three sample FTP regulated emissions is calculated using the following formula:

$$\frac{\text{MASS}}{\text{DISTANCE}} = \frac{0.43 \times (\text{MASS } 1 + \text{MASS } 2)}{(\text{DIST. } 1 + \text{DIST. } 2)} + \frac{0.57 \times (\text{MASS } 3 + \text{MASS } 2)}{(\text{DIST. } 3 + \text{DIST. } 2)}$$

Since the same driving cycle is involved, Distance 3 is essentially equal to Distance 1 and this equation can be reduced to:

$$3\text{-FTP M/D} \approx \frac{0.43 \times (M1 + M2) + 0.57 \times (M3 + M2)}{D1 + D2}$$

For the four-cycle FTP, two sample, composite values determined in this project, the following formula was used:

$$\frac{\text{MASS}}{\text{DISTANCE}} = \frac{0.43 \times M(1 + 2)}{(D1 + D2)} + \frac{0.57 \times M(3 + 4)}{(D3 + D4)}$$

Since Distance 3 is equal to Distance 1 and Distance 4 is equal to Distance 2, this equation can be reduced to:

$$4\text{-FTP M/D} \approx \frac{0.43 \times M(1 + 2) + 0.57 \times M(3 + 4)}{D1 + D2}$$

TABLE 4. TEST SEQUENCE FOR EACH MALFUNCTION

<u>Sequence</u>	<u>Operation Performed on Vehicle</u>
Upon Receipt	Replace oil, oil filter and fuel. Precondition 40 minutes at 64 km/hr plus UDDS. Tune-up to manufacturer's specifications.
1	Precondition for 20 minutes at 64 km/hr plus two UDDS.
2	Run FTP, SET, HFET - Sample and analyze emissions.
3	Modify to operate in a malfunction condition.
4	Precondition for 20 minutes at 64 km/hr plus two UDDS.
5	Run FTP, SET, HFET - Sample and analyze emissions.
6	Run Short Cycle Procedures.
7	Run FTP, SET, HFET - Sample and analyze emissions.
8	Run Short Cycle Procedures.
9	Return to unmodified condition and tune-up to manufacturer's specifications.

FTP - Federal Test Procedures

SET - Congested Freeway Driving Schedule

HFET - Highway Fuel Economy Driving Schedule

TABLE 5. LABORATORY TEST SEQUENCE

1. Precondition, UDDS
2. Soak 12 to 20 hours
3. FTP - 4 bags for gaseous emissions
2 filters or impinger samples
4. Soak 20 minutes - Fan off
5. Precondition first 505 seconds of UDDS
6. Idle 1 minute (± 15 seconds)
 - (a) auto. trans. - drive
 - (b) start additional cooling blowers
 - (c) place filter holder in tunnel
7. SET - 1 bag sample
1 filter or impinger sample
8. Engine Off - 10 minutes - Fan Off
9. HFET - 1 bag sample
1 filter or impinger sample

NOTE: 5000 cfm fan on during all car operation.
Additional tire and fuel tank cooling blowers on
during all SET and HFET operation.

TABLE 6. SUMMARY OF DRIVING SCHEDULE PARAMETERS

<u>Driving Schedule</u>	<u>Cycle</u>	<u>Duration, Seconds</u>	<u>Distance, Kilometers</u>	<u>Average Speed</u>	
				<u>km/hr</u>	<u>mph</u>
FTP	505	505	5.8	--	--
	867	867	6.2	--	--
	UDDS	1372	12.0	31.4	19.5
SET	--	1398	21.7	56.0	34.8
HFET	--	765	16.5	77.6	48.2

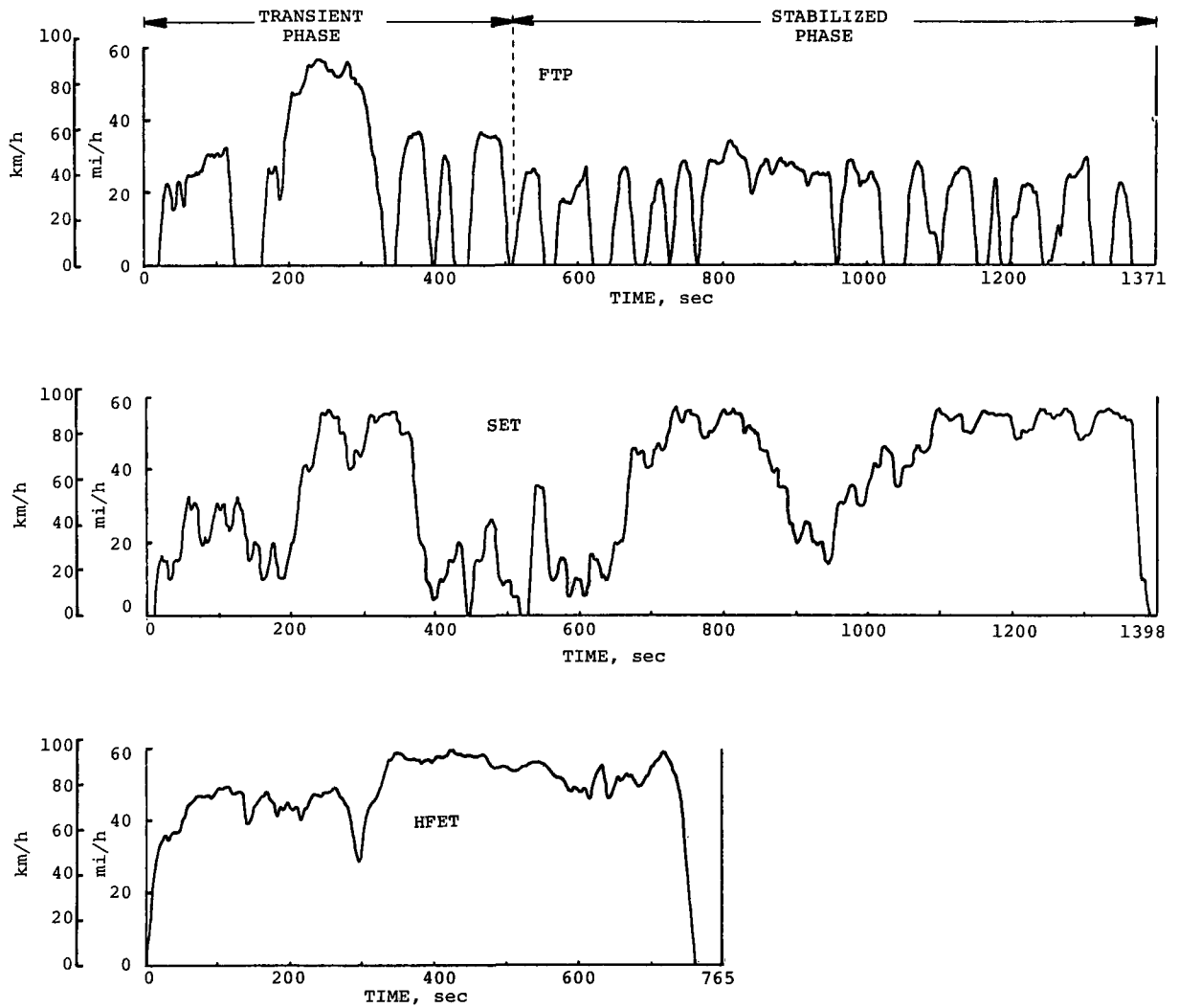


Figure 3. Driving cycle speed vs time traces

G. Test Numbering System

The numbering system, established for the various related unregulated emissions projects conducted at this laboratory, consists of six digits. One of the digits was not required for this project so a dash (-) was used in its place. The designation used for all vehicle testing was PVM-ST. The meaning of each letter or group of letters is described as follows:

	<u>Description</u>	<u>As used for this project</u>
PV	Vehicle Designation	
	P Project	7
	V Vehicle	1 through 4
M-	Condition Tested	
	M Malfunction	1 through 3
	- Space not used in this project	-
S	Test Series (Unmodified or Malfunction)	1 through 3*
T	Individual Test (FTP, SET or HFET)	1 through 3

The PV is used to identify the vehicle tested.

In this project, the test condition is sufficiently identified by one digit so the M, followed by a dash (-), was used to identify the specific malfunction conditions.

The S designates the test series where:

- 1 = Unmodified vehicle
- 2 & 3 = Initial and repeat test in a malfunction configuration

The T designates the individual test conducted where:

- 1 = FTP; 2 = SET; and, 3 = HFET

*In one or two special cases, a higher number was used to designate a rerun or an unplanned malfunction.

H. Short-Test Procedures

Regulated emissions were also evaluated over several I/M short-test procedures. These procedures are described by the data sheet in Appendix A-1 and are listed as follows:

- 50 mph Cruise Test
- 4-Mode Idle Tests
- Loaded 2-Mode Test
- Propane Gain Checks

All of these short-test procedures were conducted with the engine in a warmed-up operating condition. HC and CO emission rates were measured in all, except the propane gain checks. The propane gain checks involved determination of change in engine idle speed as propane was inducted into the intake of the engine.

I. Computational Methods

The methods used for calculating the unregulated emissions results are given in Appendix A-3. All regulated emissions were calculated using the methods prescribed in the Code of Federal Regulations for Light-Duty Vehicles.⁽⁶⁾ On the computer printouts for the regulated emissions, included in Appendix D, all items of potential interest are identified by descriptive headings. Items on the computer sheet identified only by abbreviated headings are used in calculating the unregulated emissions.

III. ANALYTICAL PROCEDURES FOR UNREGULATED EMISSIONS

The analytical procedures used to measure the unregulated emissions are summarized in this section. A detailed description of most of the procedures, along with a discussion of their development, validation, and qualification, is available in Interim Report II, "Analytical Procedures for Characterizing Unregulated Pollutant Emissions from Motor Vehicles," developed in a related EPA Project.⁽⁵⁾

A. Description of the Analytical Procedures

The unregulated emissions evaluated in this project, along with the methods for sampling and the procedures used in the analyses, are listed in Table 7. Organic amines, aldehydes and ketones, organic sulfides, individual hydrocarbons, and metals and other elements represent groups of compounds. The respective procedures separate and identify a number of individual compounds within each of these groups. The analytical procedures involved in this project are briefly described as follows:

Organic Amines - The collection of organic amines (monomethylamine, monoethylamine and dimethylamines, trimethylamines, diethylamine, and triethylamine) is accomplished by bubbling CVS-diluted exhaust through glass impingers containing dilute sulfuric acid. The amines are complexed by the acid to form stable sulfate salts which remain in solution. A portion of this solution is then injected into a gas chromatograph equipped with an ascarite loaded pre-column and a nitrogen-phosphorus detector (NPD). External amine standards in dilute sulfuric acid are used to quantify the results.

Ammonia - Ammonia in CVS-diluted automotive exhaust is measured in the protonated form, NH_4^+ , after collection in dilute H_2SO_4 . The acidification is carried out in a glass impinger maintained at ice bath temperature. A sample from the impinger is then analyzed for ammonia in an Ion Chromatograph and the concentration in the exhaust is calculated by comparison to an ammonium sulfate standard solution.

Aldehydes and Ketones - The collection of aldehydes (formaldehyde, acetaldehyde and hexanaldehyde) and ketones (acetone and methylethylketone) is accomplished by bubbling CVS diluted exhaust through glass impingers containing 2,4-dinitrophenylhydrazine (DNPH) in dilute hydrochloric acid. The aldehydes and ketones (also known as carbonyl compounds) react with the DNPH to form their respective phenylhydrazone derivatives. These derivatives are insoluble or only slightly soluble in the DNPH/HCl solution and are removed by filtration followed by pentane extractions. The filtered precipitate and the pentane extracts are combined and then the pentane is evaporated in a vacuum oven. The remaining dried extract contains the phenylhydrazone derivatives. The extract is dissolved in a quantitative volume of toluene containing a known amount of anthracene as an internal standard. A portion of this dissolved extract is injected into a gas chromatograph and analyzed for several individual aldehydes and ketones, using a flame ionization detector.

TABLE 7. SAMPLING AND ANALYSIS METHODOLOGY FOR UNREGULATED EMISSIONS

Compound	Sampling	Method of Analysis
Organic Amines	Impinger	Gas chromatograph with ascarite pre-column and nitrogen-phosphorus detector (GC-NPD).
Ammonia (NH ₃)	Impinger	Ion chromatograph.
Aldehydes & Ketones	Impinger	Dinitrophenylhydrazone derivative. Gas chromatograph with flame ionization detector (GC-FID).
Hydrogen Sulfide (H ₂ S)	Impinger	Methylene blue derivative. Spectrophotometer.
Total Cyanide [Hydrogen Cyanide (HCN) and Cyanogen (C ₂ H ₂)]	Impinger	Cyanogen chloride derivative. Gas chromatograph with electron capture detector (GC-ECD).
Carbonyl Sulfide (COS) and Organic Sulfides	Trap	Gas chromatograph with flame photometric detector (GC-FPD).
Individual Hydrocarbons	Bag	Gas chromatograph with flame ionization detector (GC-FID).
Metals and Other Elements	Filter	Weighed using microbalance. Spectral X-ray analysis at RTP.
Particulates	Filter	Weighed using microbalance.
Sulfate	Filter	Barium chloranilate derivative (BCA). Liquid chromatograph with ultraviolet detector.
Leaded Fuel Components	Bag	Gas chromatograph with electron capture detector (GC-ECD).

Hydrogen Sulfide - The collection of hydrogen sulfide is accomplished by bubbling CVS-diluted exhaust through glass impingers containing a buffered zinc acetate solution which traps the sulfide ion as zinc sulfide. The absorbing solution is then treated with N,N-dimethyl-paraphenylene diamine sulfate and ferric ammonium sulfate. Cyclization occurs, forming the highly colored heterocyclic compound methylene blue (3,9-bisdimethyl-aminophenazothionium sulfate). The resulting solution is analyzed with a spectrophotometer at 667 nm in a 1-cm or 4-cm pathlength cell depending upon the concentration.

Total Cyanide (Hydrogen Cyanide plus Cyanogen) - The collection of total cyanide is accomplished by bubbling CVS-diluted exhaust through glass impingers containing a 1.0 N potassium hydroxide absorbing solution. This solution is maintained at ice bath temperature. An aliquot of the absorbing reagent is then treated with KH_2PO_4 and Chloramine-T. A portion of the resulting cyanogen chloride is injected into a gas chromatograph equipped with an electron capture detector (ECD). External CN^- standards are used to quantify the results.

Carbonyl and Organic Sulfides - The collection of carbonyl sulfide (COS) and the organic sulfides, methyl sulfide (dimethylsulfide, $(\text{CH}_3)_2\text{S}$), ethyl sulfide (diethylsulfide, $(\text{C}_2\text{H}_5)_2\text{S}$) and methyl disulfide (dimethyldisulfide, $(\text{CH}_3)_2\text{S}_2$), is accomplished by passing CVS-diluted exhaust through Tenax GC traps at -76°C . At this temperature the traps remove the organic sulfides from the dilute exhaust. The organic sulfides are thermally desorbed from the traps into a gas chromatograph sampling system and injected into a gas chromatograph equipped with a flame photometric detector for analysis. External organic sulfide standards generated from permeation tubes are used to quantify the results.

Individual Hydrocarbons - For measurement of selected individual hydrocarbons, methane (CH_4), ethane (C_2H_6), ethylene (C_2H_4), acetylene (C_2H_2), propane (C_3H_8), propylene (C_3H_6), benzene (C_6H_6), and toluene (C_7H_8), a sample of CVS-diluted exhaust is collected in a Tedlar bag. This bagged sample is then analyzed for individual hydrocarbons using a gas chromatographic system containing four separate columns and a flame ionization detector. The peak areas are compared to an external calibration blend and the individual hydrocarbon concentrations are obtained using a Hewlett-Packard 3354 computer system.

Metals and Other Elements - The metals are collected as particulate on a 47 mm Fluoropore filter, which is then sent to Research Triangle Park (RTP) for analysis by X-ray spectroscopy. The diluted exhaust sample is taken isokinetically from within the dilution tunnel. Weight gain on the filter is determined by weighing the filter on a microbalance before and after sampling.

Particulate - The "particulate" is collected isokinetically on a

47 mm glass fiber filter. The amount of "particulate" collected is determined by weighing the filter on a microbalance before and after sampling.

Sulfate - Automotive exhaust is vented into a dilution tunnel where it is mixed with a flowing stream of filtered room air. In the tunnel, the SO_3 reacts rapidly with water in the exhaust to form sulfuric acid aerosols. The aerosols grow to a filterable size range within the tunnel and are collected isokinetically on a fluorocarbon membrane filter. Particulate sulfate salts are also collected on the filter.

Sulfuric acid collected on the filter is then converted to ammonium sulfate by exposure to ammonia vapor. The soluble sulfates are leached from a filter with a measured volume of an isopropyl alcohol - water solution (60% IPA). A fixed volume of the sample extract is injected into a high pressure liquid chromatograph (HPLC) and pumped through a column of strong cation exchange resin in Ag^+ form to scrub out the halides (Cl^- , Br^-) and then through a column of strong cation exchange resin in H^+ form to scrub out the cations and convert the sulfate to sulfuric acid. Passage through a reactor column of barium chloranilate crystals precipitates out barium sulfate and releases the highly UV absorbing chloranilate ions. The amount of chloranilate ions released is equivalent to the sulfate in the sample and is measured by a sensitive liquid chromatograph UV detector at 310-313 nanometers. All the reactions and measurement take place in a flowing stream of 60% IPA. The scrubber and reactor columns also function as efficient filter media for any solid reaction products formed during passage of the sample through the column system.

Leaded Fuel Components - For measurement of the leaded fuel components tetraethyllead (TEL), tetramethyllead (TML), ethylene dibromide (EDB), and ethylene dichloride (EDC), a sample of CVS-diluted exhaust is collected in a Tedlar bag. Evaluation of this bagged sample is accomplished by direct analysis using a gas chromatograph equipped with an electron capture detector. This procedure is described in Appendix A-3.

B. Validation and Qualification of the Analytical Procedures

The analytical procedures used in this project were subjected to a series of validation and qualification experiments. Validation experiments for leaded fuel components were conducted in this project. For the other analytical procedures, the validation and qualification experiments were conducted in previous projects. Validation experiments included checks for sample stability, sample collection efficiency, detector linearity, interferences, and analysis repeatability. Qualification experiments included the injection of the compound of interest into the tunnel with and without the presence of exhaust and the subsequent recovery of that compound at the procedure sampling point.

Sample stability checks were performed using repeated analyses of the same sample at intervals over a specified period of time and comparing the results to the initial analysis. Organic amines, aldehydes and ketones,

ammonia, total cyanide, nitrous oxide and individual hydrocarbon samples were found to be stable for several days. Carbonyl and organic sulfides and the hydrogen sulfide samples were found to be stable for approximately one day.

Sample collection efficiency experiments were performed by passing a known concentration of sample through a series of impingers or traps and analyzing each impinger or trap individually for the compound of interest. All of these procedures used in this project had a collection efficiency of 98% or better. Detector linearity experiments were performed by preparing several samples of various known concentrations and plotting the resulting peak areas versus the concentrations. The procedures had linear response over the range of interest in this project.

To determine interferences from other compounds, for each procedure, known exhaust components were introduced into the sample to determine their effect on the resultant measurements. To determine analysis repeatability, several samples of known concentrations were prepared and a number of complete analyses were performed at each concentration. The results of these tests were then compared to determine analysis repeatability.

The qualification experiments were performed to determine if the compounds of interest could travel the length of the dilution tunnel in the presence of dilute exhaust without significant loss by reaction with exhaust or the tunnel itself. The compounds were introduced at the same point at which the exhaust enters the tunnel and were sampled at the normal sampling point. Table 8 lists the procedures for which validation and qualification experiments have been performed.

C. Accuracy of the Analytical Procedures

A difficult, but very important, endeavor was the determination of procedural accuracy for each analytical method. The primary difficulty involved those procedures in which the exhaust compounds are trapped or absorbed, an extraction or subsequent reaction is performed, and then a portion of the extract is analyzed. After much consideration, in the previous malfunction projects, the decision was reached to initially define the accuracy in terms of a "minimum detection value" (MDV). The MDV, as used in this report, is defined as the value above which it can be said that the compound has been detected in the exhaust (i.e., at a measured value equal to the MDV, the accuracy is equal to plus or minus the MDV). Determination of accuracy over the entire range of each procedure was beyond the scope of these projects.

For compounds collected by bag samples, the MDV was determined from the instrument detection limits only and is independent of the sampling rate and duration. For compounds which are concentrated in impingers or traps, the MDV is dependent on the instrument detection limit, chemical workup, sampling rate and sampling duration. The MDV's listed in Table 9 were derived using the listed sampling rates and a 23-minute sampling period.

TABLE 8. PROCEDURAL VALIDATION AND QUALIFICATION

<u>Compound or Compound Group</u>	<u>Validation Conducted</u>	<u>Qualification Conducted</u>
Organic Amines	Yes	Yes (significant tunnel losses)
Ammonia	Yes	Yes (significant tunnel losses)
Aldehydes & Ketones	Yes	Yes
Hydrogen Sulfide	Yes	Yes
Total Cyanide	Yes	Yes
Carbonyl Sulfide and Organic Sulfides	Yes	Yes (significant tunnel losses)
Individual Hydrocarbons	Yes	No ^a
Metals and Other Elements	No ^a	No ^a
Particulates	No ^a	No ^a
Sulfate	No ^a	No ^a
Leaded Fuel Components	Yes	No

^a Established procedure

TABLE 9. EMISSION PROCEDURAL SAMPLE RATES AND ACCURACY

		Mol. Weight	Sample Flow ℓ/100	μg/m ³ per ppm	Procedural Minimum Detection Values ^a		MDV for FTP, ^b mg/km
					ppm	μg/m	
Test Number,	PVM-ST	--	--	--	--	--	--
Barometer,	mm Hg	--	--	--	--	--	--
Humidity,	g/kg	--	--	--	--	--	--
Temperature,	°C	--	--	--	--	--	--
Total Fuel Sulfur,	mg/km	--	--	--	--	--	--
Avg. Exh. Oxygen		32.00	--	--	--	--	--
Catalyst Avg. Temp.,	°C	--	--	--	--	--	--
Catalyst Max. Temp.,	°C	--	--	--	--	--	--
Carbon Dioxide,	g/km	44.01	Bag	--	--	--	--
Fuel Cons.,	ℓ/100 km	--	--	--	--	--	--
<u>Regulated Emissions</u>							
Hydrocarbons (THC)		11.88	Bag	575	1.0 ^c	575	10
Carbon Monoxide		28.01	Bag	1165	2.0 ^c	2330	40
Oxides of Nitrogen		46.01	Bag	1915	0.5 ^c	958	16
<u>Particulates</u>							
Total Particulates		--	14.0	--	--	<50	<1
Sulfate		96.01	14.0	4000	<0.01	6	0.1
<u>Compound Group Totals</u>							
Aldehydes & Ketones		--	4.0	--	--	--	≈0.5
Individual Hydrocarbons		--	Bag	--	--	--	≈0.5
Organic Sulfides		--	0.13	--	--	--	≈0.05
Organic Amines		--	4.0	--	--	--	≈0.1
<u>Other Compounds</u>							
Ammonia		17.03	4.0	710	0.01	7	0.1
Cyanide & Cyanogen		26.02	4.0	1080	0.01	11	0.2
Hydrogen Sulfide		34.08	4.0	1415	0.01	14	0.2
Tetramethyllead		267	Bag	22	0.002	22	0.4
Ethylene Dichloride		99	Bag	21	0.005	21	0.4
Tetraethyllead		323	Bag	270	0.020	268	5.0
Ethylene Dibromide		188	Bag	39	0.005	39	0.7

^aBased on a 23-minute sampling period at the specified flow rate for all impinger, filter and trap collected samples.

^bBased on μg/m³ in the diluted exhaust and typical UDDS (FTP 505 and 866) parameters (1371 seconds, 206 m³ CVS flow, 12.07 km, 0.98 DSFC) mg/km for FTP ≈ μg/m³ × 206 ÷ 12.07 × 0.98 × 0.001 ≈ 0.0168 × μg/m³.

^cBased on the lowest instrument ranges used in this project.

TABLE 9 (Cont'd). EMISSION PROCEDURAL SAMPLE RATES AND ACCURACY

	Mol. Weight	CRC ^d Synonym	µg/m ³ per ppm	Procedural Minimum Detection Values ^a		MDV for FTP, mg/km ^b
				ppm	µg/m ³	
<u>Aldehydes and Ketones</u>						
Formaldehyde	30.03	--	1250	0.01	15	0.2
Acetaldehyde	44.05	--	1830	0.01	20	0.3
Acetone ^e	58.08	2-Propanone	2415	0.01	25	0.4
Methylethylketone	72.12	2-Butanone	3000	0.01	30	0.5
Hexanaldehyde	100.16	Hexanal	4165	0.01	40	0.7
<u>Individual Hydrocarbons</u>						
Methane	16.04	--	665	0.05	30	0.5
Ethylene	28.05	Ethene	1165	0.03	30	0.5
Ethane	30.07	--	1250	0.03	30	0.5
Acetylene	26.04	Ethyne	1085	0.03	30	0.5
Propane	44.11	--	1835	0.02	30	0.5
Propylene	42.08	Propene	1750	0.02	30	0.5
Benzene	78.12	--	3245	0.02	30	0.5
Toluene	92.15	--	3830	0.02	30	0.5
<u>Organic Sulfides</u>						
Carbonyl Sulfide	60.08	--	2500	0.001	3	0.04
Methyl Sulfide	62.13	Dimethyl	2585	0.001	3	0.04
Ethyl Sulfide	90.19	Diethyl	3750	0.001	4	0.06
Methyl Disulfide	94.20	Dimethyl	3915	0.001	4	0.06
<u>Organic Amines</u>						
Monomethylamine	31.06	Amino-Methane	1290	0.002	3	0.05
Monoethylamine ^f	45.09	Amino-Ethane	1875	0.002	4	0.05
Trimethylamine	59.11	--	2460	0.002	5	0.08
Diethylamine	73.14	--	3040	0.002	6	0.10
Triethylamine	101.19	--	4205	0.002	8	0.14

a & b See initial page of this table.

^d Handbook of Chemistry and Physics, 54th Edition.

^e Includes Acrolein - 56.07 and Propionaldehyde - 58.08 (CRC - Propenal and Propanal, respectively).

^f Includes Dimethylamine - 45.09.

IV. CAR PREPARATION AND TESTING

Regulated and unregulated emissions from four 1970 model cars were measured with the cars operating in the unmodified and up to three malfunction conditions. This section describes these evaluations and presents the test results.

A. Car Preparation and Maintenance Record

As initially established, this project was to involve a minimum of car tune-up, maintenance and repair. Upon receipt of the cars, however, the scope of the tune-up was expanded. As the testing progressed, the scope of maintenance and repair was also expanded. Based on the experience of this project, and in a heavy-duty engine project involving older in-use engines (EPA Contract No. 68-03-2603), it is recommended that extensive tune-up, maintenance and repair be performed on all older in-use engines and vehicles prior to initiation of testing.

After receipt, each car was given a relatively minor tune-up and maintenance check. The results of these initial tune-ups and checks, along with subsequent maintenance and repairs, are summarized in Table 10. The conditions that occurred with the Chevrolet Monte Carlo and the Ford Fairlane directly affected some of the tests conducted, resulting in some unplanned malfunction conditions.

B. Malfunction Conditions Evaluated

Each of the four cars was to be evaluated in the unmodified and three malfunction conditions. These conditions are described as follows:

<u>Test Number</u>	<u>Condition</u>	<u>Description</u>
XXX-1	Unmodified	Engine tuned-up to manufacturer's specifications.
XX1-2,3	Rich Best Idle	Idle fuel mixture producing highest idle speed.
XX2-2,3	12% Misfire	Essentially random ignition misfire twelve percent of the total.
XX3-2,3	Lean Idle	Idle fuel-to-air mixture at which the extent of lean misfire remains barely acceptable.

In some cases, the rich and lean idle conditions were limited by internal limits in the carburetor and the condition described could not quite be attained. The twelve percent misfire was obtained using a misfire generator assembled and used in the previous malfunction projects.

TABLE 10. CAR TUNE-UPS, MAINTENANCE AND REPAIRS

	Oldsmobile	Dodge	Chevrolet	Ford
Car Number	71	72	73	74
Model	Delta 88	Challenger	Monte Carlo	Fairlane
Engine	455-8	225-6	350-8	302-8
As Received (As-SET):				
Ignition Timing	9°B(8°B)	2°B(TDC)	8°B(4°B)	3°A(--) ^a
Dwell	32°(30°)	44°(44°)	30°(30°)	21°(26°)
Idle RPM	1200(575)	620(750)	575(600)	550(600)
Idle HC, ppm	2300(185)	254(195)	260(260)	80(--)
Idle CO, %	0.03(0.2)	0.2(0.4)	0.1(0.1)	0.2(--)
Idle Vacuum	--(15)	--(18)	--(--)	--(16)
Battery	b	b	b	b
Choke	✓	✓	✓	✓
Plugs	✓	✓	✓	✓
PCV	✓	✓	✓	✓
Points	✓	✓	✓	✓
Coolant	✓	✓	✓	✓
Alternator	✓	✓	✓	✓
Air Filter	Dirty	✓	✓	✓
Fluid Levels:				
Engine Oil	✓	✓	✓	✓
Transmission	1 Pint Low	✓	4 Quarts Low ^c	✓
Differential	✓	1/2 Pint Low	✓	✓
Steering	✓	✓	✓	✓
Brakes	✓	✓	✓	✓
Initial Repairs:				
	Throttle Linkage	Plug Wire		
	Vacuum Hose	Brakes		
	Water Pump			
	Trans. Cont.			
	Spark ^d			
Subsequent Repairs:			Accelerator Cable ^e	Timing ^f
			Trans. Cont.	
			Spark ^d	

^a 4°A mark was mistakenly taken to be 6°B.^b Batteries were recharged or replaced as required.^c Leaked at all seals.^d Vacuum lines were hooked up incorrectly.^e Did not enable W.O.T. operation.^f Ignition timing marks were cleared and timing set at 6°B.

The actual conditions evaluated are briefly described as follows:

<u>Test Number</u>	<u>Malfunction Description</u>
Oldsmobile Delta 88:	
711-X	Rich Best Idle Series
712-1,2,4	12% Ignition Misfire Series
712-3*	12% Misfire plus Unknown Malfunction
Dodge Challenger:	
721-X	Rich Best Idle Series
722-X	12% Misfire Series
723-X	Lean Idle Series
Chevrolet Monte Carlo:	
731-1,3,4	Rich Best Idle Series
731-2*	Rich Best Idle plus TCS not Functioning
732-1*	Trans. Cont. Spark not Functioning
732-2,3*	12% Misfire plus TCS not Functioning
733-1	Unmodified (Repeat in place of 732-1)
Ford Fairlane:	
741-X	Rich Best Idle Series
742-1*	Ignition Timing 10° Retard
742-2,3*	12% Misfire plus Timing 10° Retard
743-X	Lean Idle Series
744-1	Unmodified (Repeat in place of 742-1)

*Unplanned malfunction condition.

Tests identified with a -1 designate a planned unmodified condition and those identified with a -2 or higher designate a planned specific malfunction condition. The asterisk designates an unplanned malfunction. There were a total of eight test sequences with unplanned malfunction conditions. Most of these were associated with malfunction conditions which went undetected through the minor tune-up and maintenance checks. This illustrates a need for extensive tune-up and maintenance checks when evaluating older in-use vehicles.

C. Regulated and Unregulated Emissions Tests Results

Summaries of the test results are included in Appendix B. Individual sample data for the FTP evaluations are included in Appendix C and the computer printouts for the regulated emissions are included in Appendix D. The analyses and discussion of these test results are included in Section V of this report. All FTP unregulated emissions data are based on appropriately weighted four-cycle FTP results.

In the data tables, a double dash (--) has been used when no test data were available. This occurs for unregulated emissions when valid

test data could not be obtained due to instrument malfunction or loss of the sample.

D. I/M Short-Test Procedure Results

Each car was evaluated over four short-tests after each emissions test sequence. Three of the short-tests involved measurement of HC and CO under steady-state operating conditions. The other short-test involved determination of maximum engine speed at idle with propane injection into the intake of the engine. The HC and CO emission analyzers used are in a Beckman cart which was initially designed for and used in nine-mode heavy-duty engine evaluations. HC was measured as ppm hexane.

The results of the short-test evaluations are reported in Appendix E and are summarized in Table 11. In general, the rich idle condition produced high CO at idle and the lean idle produced high HC at idle. The twelve percent misfire condition produced high HC in all of the modes evaluated. The malfunction configurations were also correctly reflected by the results of the propane enrichment evaluations. The increase in engine speed was large at the lean idle condition and negligible at the rich idle condition.

E. Other Evaluations

In the evaluations with Car 74, particulates were determined using both glass fiber and Pallflex filters. Results of these evaluations are summarized in Table 12. In all tests, more total particulates were collected on the glass fiber filters than on the Pallflex filters. This ratio of GF/PF was highest for the FTP, with an overall average of 1.9, and lowest for the SET, with an overall average 1.4. No further evaluations were conducted using Pallflex filters. To enable direct comparisons with results obtained in the previous malfunction projects, results obtained using glass fiber filters are reported in the summary tables.

TABLE 11. SUMMARY OF I/M SHORT TEST RESULTS

Undiluted Exhaust Emissions								
	HC Emissions, ppm Hexane				CO Emissions, Percent			
	Unmod.	Rich	Misfire	Lean	Unmod.	Rich	Misfire	Lean
<u>Car 71</u>								
Idle	130	210	1340	--	0.1	5.1	0.1	--
2500 rpm	110	145	1200	--	0.3	0.4	0.4	--
30 mph	160	205	1525	--	0.3	0.8	0.4	--
50 mph	165	180	1480	--	0.5	0.8	0.3	--
<u>Car 72</u>								
Idle	210	420	1700	1900	0.4	7.2	0.5	0.2
2500 rpm	190	250	1500	420	0.2	0.2	0.2	0.3
30 mph	250	340	1680	400	0.1	0.5	0.2	0.1
50 mph	210	240	1460	290	0.2	0.2	0.3	0.8
<u>Car 73</u>								
Idle	155	280	1470	--	0.1	6.1	0.1	--
2500 rpm	120	135	1310	--	0.5	0.7	0.5	--
30 mph	210	325	1400	--	0.1	0.6	0.1	--
50 mph	210	235	1460	--	0.6	0.8	0.4	--
<u>Car 74</u>								
Idle	250	450	1400	1600	0.2	9.0	0.1	0.2
2500 rpm	100	150	1300	300	0.3	0.3	0.3	0.3
30 mph	200	400	1500	300	0.1	0.4	0.1	0.1
50 mph	200	200	1500	200	0.4	0.5	0.4	0.4

Car	Gear	Idle Propane Enrichment, rpm Increase			
		Unmod.	Rich	Misfire	Lean
71	Neutral	120	0	110	--
72	Neutral	110	0	100	960
73	Neutral	180	0	170 ^a	--
74	Neutral	150	0	150	650
71	Drive	60	0	60	--
72	N.A.	--	--	--	--
73	Drive	70	0	60	--
74	Drive	60	0	80	230

^aWithout vacuum advance.

Car 71 - 1970 Oldsmobile Delta 88
 Car 72 - 1970 Dodge Challenger
 Car 73 - 1970 Chevrolet Monte Carlo
 Car 74 - 1970 Ford Fairlane

TABLE 12. COMPARISON OF PALLFLEX AND GLASS FIBER FILTERS
Car 74 - 1970 Ford Fairlane

	Total Particulates, mg/km								
	FTP			SET			HFET		
	GF	PF		GF	PF		GF	PF	
741-1	119	50		70	64		90	83	
742-1	86	44		76	55		64	36	
743-1	82	44		89	70		64	45	
Avg.	96	46		78	63		73	55	
GF/PF	2.09			1.23			1.33		
741-2	116	58		118	81		110	63	
741-3	106	63		86	60		91	56	
Avg/	111	61		102	71		101	60	
GF/PF	1.82			1.44			1.68		
742-2	88	48		85	68		79	45	
742-3	94	48		97	69		81	47	
Avg.	91	48		91	69		80	46	
GF/PF	1.90			1.32			1.74		
743-2	186	103		125	80		123	65	
743-2	173	92		124	79		116	53	
Avg.	180	98		125	80		120	59	
GF/PF	1.84			1.56			2.03		
	FTP			SET			HFET		
	Min.	Max.	Avg.	Min.	Max.	Avg.	Min.	Max.	Avg.
GF/PF	1.8	2.1	1.9	1.2	1.6	1.4	1.3	2.0	1.7

V. ANALYSES OF THE RESULTS

This section reports the analyses performed on the emissions data generated in this project. These analyses involved averaging and reformatting to enable making various comparisons of the data. Due to the very limited number of data points for each emission at each specific condition, advanced statistical analyses were judged to be inapplicable. In addition to presenting these data in formats that enable ready review and comparison, these results are also compared with results obtained in several previous related projects.

A. Average Emissions Values

The initial analyses of these data involved averaging of the results for each of the configurations evaluated, and these data are given in Appendix F. A summary of emission rates, of selected compounds measured in the unmodified configuration (i.e., tuned-up to manufacturer's specifications), is given in Table 13. With few exceptions, these emission rates were reasonably consistent between the four cars tested, based on the experience from the previous projects. Leaded fuel components (TML, EDC, TEL and EDB) were not detected in any of the evaluations in the unmodified configuration.

B. Regulated Emissions and Fuel Consumption

The analyses of the regulated emissions and fuel consumption results were straightforward, since test-to-test repeatability was generally good. A summary of the FTP regulated emissions and fuel consumption data, for all configurations tested, is presented in Table 14. In general, rich idle significantly increased CO, twelve percent misfire greatly increased HC, and lean idle produced some increase in HC. The fuel consumption varied greatly between the four cars tested in the unmodified configuration. This variation in fuel consumption was expected, since these cars differed greatly in inertia weight and engine size.

C. General Effects of Malfunctions on Emissions

An evaluation that can provide some insight is whether the respective malfunctions caused increases in emissions relative to the unmodified configuration. The results of such an evaluation for the FTP results are summarized in Table 15. The rich idle and the twelve percent misfire malfunction configurations produced more significant increases than were produced with lean idle.

D. Other Elements

A summary of the elemental analyses results, for the FTP, is presented in Table 16. The cars evaluated in this project produced relatively significant emission rates of lead, bromine and chlorine in all configurations. These compounds apparently resulted from the use of the leaded fuel. Emissions of iron were increased with the twelve percent misfire configuration.

TABLE 13. AVERAGE VALUES FOR THE UNMODIFIED CONFIGURATION

	Emissions in mg/km, Except as Noted											
	FTP				SET				HFET			
	Car 71	Car 72	Car 73	Car 74	Car 71	Car 72	Car 73	Car 74	Car 71	Car 72	Car 73	Car 74
<u>Regulated Emissions</u>												
Hydrocarbons, (THC), g/km	1.43	1.71	2.05	2.35	0.91	0.87	1.23	1.63	0.95	0.68	1.26	1.59
Carbon Monoxide, g/km	17.9	19.3	18.1	13.0	5.86	5.79	5.06	6.06	5.36	3.33	5.44	5.69
Oxides of Nitrogen, g/km	2.23	1.91	2.64	3.66	2.98	2.55	3.24	4.33	3.18	2.74	3.58	4.24
<u>Particulates</u>												
Total Particulates	101.	82.	115.	96.	68.	51.	68.	79.	69.	49.	80.	73.
Sulfate	0.68	0.47	1.11	0.27	0.43	0.28	0.29	0.49	0.39	0.25	0.62	0.31
<u>Compound Group Totals</u>												
Aldehydes & Ketones	37.3	12.8	73.5	22.8	32.2	11.6	37.6 ^a	16.3	27.0	9.0	34.8	27.0
Individual Hydrocarbons	699.	719.	790.	849.	444.	364.	524.	674.	372.	243.	542.	670.
Organic Sulfides	0.08	0.01	0.22	0.00	0.03	0.03	0.10	0.00	0.02	0.00	0.06	0.00
Organic Amines	0.08	0.03	0.03	0.04	0.01	0.04	0.06	0.01	0.10	0.03	0.04	0.00
<u>Other Compounds^a</u>												
Ammonia	3.82	2.90	5.72	4.78	2.33	1.67	2.70	2.78	5.42	1.69	2.58	5.63
Cyanide & Cyanogen	3.45	5.20	3.60	0.88	1.80	3.00	1.69	1.66	6.69	6.97	4.57	5.14
Hydrogen Sulfide	0.08	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Leaded Fuel Components ^b	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Car 71 - 1970 Oldsmobile Delta 88

Car 72 - 1970 Dodge Challenger

Car 73 - 1970 Chevrolet Monte Carlo

Car 74 - 1970 Ford Fairlane

^aSingle data point.^bIncludes tetramethyllead, ethylene dichloride, tetraethyllead and ethylene dibromide.

TABLE 14. SUMMARY OF AVERAGE FTP REGULATED
EMISSIONS AND FUEL CONSUMPTION DATA

		<u>Malfunction</u>		
	<u>Unmodified</u>	<u>Rich</u> <u>Idle</u>	<u>12%</u> <u>Misfire</u>	<u>Lean</u> <u>Idle</u>
<u>Car 71, Oldsmobile</u>				
Hydrocarbon, g/km	1.4	2.0	15.2	--
Carbon Monoxide, g/km	17.6	40.0	15.8	--
Oxides of Nitrogen, g/km	2.2	2.2	2.8	--
Fuel Consumption, l/100 km	20.7	20.8	21.4	--
<u>Car 72, Dodge</u>				
Hydrocarbon, g/km	1.7	2.3	9.6	3.3
Carbon Monoxide, g/km	19.3	36.1	22.1	16.2
Oxides of Nitrogen, g/km	1.9	1.8	2.1	1.8
Fuel Consumption, l/100 km	12.5	12.9	13.2	12.6
<u>Car 73, Chevrolet</u>				
Hydrocarbon, g/km	2.1	2.9	14.0	--
Carbon Monoxide, g/km	18.1	51.9	13.8	--
Oxides of Nitrogen, g/km	2.6	2.3	1.9	--
Fuel Consumption, l/100 km	17.8	18.2	19.1	--
<u>Car 74, Ford</u>				
Hydrocarbon, g/km	2.4	3.8	14.9 ^a	3.3
Carbon Monoxide, g/km	13.0	50.1	16.9 ^a	9.6
Oxides of Nitrogen, g/km	3.7	3.3	3.4 ^a	3.7
Fuel Consumption, l/100 km	16.3	18.0	19.1 ^a	16.0

^a 12% misfire plus 10 degrees ignition retard.

TABLE 15. RELATIONSHIP OF MALFUNCTION TO
UNMODIFIED FTP EMISSION RESULTS

	Number of Cars for Which Emissions Increased Out of the Total Cars Evaluated in that Configuration		
	<u>Rich Idle</u>	<u>12% Misfire</u>	<u>Lean Idle</u>
<u>Regulated Emissions</u>			
Hydrocarbons, (THC), g/km	4/4	4/4 ^a	2/2
Carbon Monoxide, g/km	4/4 ^a	2/4 ^b	0/2
Oxides of Nitrogen, g/km	0/4	2/4 ^b	0/2
<u>Particulates</u>			
Total Particulates	2/4 ^b	4/4	0/2
Sulfate	2/4 ^b	2/4	2/2 ^b
<u>Compound Group Totals</u>			
Aldehydes & Ketones	3/4 ^b	4/4 ^a	1/2
Organic Sulfides	1/4 ^b	2/4 ^b	2/2 ^b
Organic Amines	3/4 ^b	2/4 ^b	1/2 ^b
<u>Other Compounds</u>			
Ammonia	1/4	2/4	1/2 ^b
Cyanide & Cyanogen	4/4	0/4	1/2
Hydrogen Sulfide	0/4	0/4	0/2
<u>Other Elements^c</u>			

^aOver 100 percent increase.

^bChanges were relatively minor and/or inconsistent.

^cDiscussed separately.

TABLE 16. SUMMARY OF THE ELEMENTAL ANALYSES
RESULTS FOR THE FTP

Test	Exhaust Emission, mg/km								
	Pb	Br	P	Al	S	Cl	Zn	Fe	Ca
71U	19.7	12.7	0.1	0.1	0.2	7.6		2.2	0.1
711	17.1	9.9	0.1			6.4		0.2	0.1
712	33.1	15.6	0.1	0.1	0.6	5.7		4.5	0.1
72U	15.0	6.6	0.1		0.2	4.4	0.2	4.8	0.1
721	10.3	4.5	0.1		0.1	2.3	0.4	0.7	
722	15.7	6.2	0.1		0.2	3.9	0.2	3.3	
723	14.3	6.7	0.1		0.1	3.0	0.1	0.4	
73U	20.3	8.9	0.2	0.2	0.5	2.5	0.1	3.4	0.1
731	16.6	7.7	0.1	0.3	0.4	2.5		1.2	
732	35.4	13.2	0.2	0.4	1.3	3.2	0.3	15.2	0.3
74U	19.4	8.8	0.2		0.1	3.7	0.1	0.6	0.2
741	25.0	11.3	0.2		0.2	6.7	0.1	1.1	0.2
742	33.4	13.1	0.3	0.1	0.8	4.9	0.2	12.6	0.2
743	19.3	9.1	0.2		0.1	3.3	0.1	0.3	0.2

Pb - Lead

Al - Aluminum

Zn - Zinc

Br - Bromine

S - Sulfur

Fe - Iron

P - Phosphorus

Cl - Chlorine

Ca - Calcium

Test	Description
7XU	Unmodified Configuration
7X1	Rich Idle
7X2	12% Ignition Misfire
7X3	Lean Idle

Note: Compounds not included in this table had rates which never exceeded 0.14. All blanks in the table represent values less than 0.05.

E. Maximum Emission Values

The maximum emissions values for all four cars were determined and these data are presented in Table 17. The data listed in Table 17 are the highest of the averaged emission rates obtained with any of the four cars. These data are listed separately for the unmodified and for the malfunction configurations. The last pages of Table 17 identify the car test which produced this maximum value.

Table 17 is intended to provide some insight into which compounds may be of potential concern. After "threshold levels for concern" are established for the unregulated emissions, this table will enable ready screening to determine which of the unregulated emissions may be a potential cause for concern; and perhaps aid in setting priorities for further investigation into possible hazardous toxicity effects. Further review of the results given in Appendices B and F would then be required to establish whether or not concern is actually justified.

F. Relative Importance of the Maximum Emission Rates

There are established automotive source emission standards for HC, CO, NO_x and diesel particulate. Such standards can be utilized in a comparative analyses of the emission results for those compounds. For the other compounds evaluated, however, attempted analyses of relative importance require the application of some other available criteria.

The criteria utilized in the previous malfunction projects were the Threshold Limit Values (TLV) and the procedure used was described in the final report for the initial project.⁽¹⁾ In brief, the criteria and procedure are described as follows:

The maximum emission rates (MER) are converted to an equivalent maximum emission concentration (MEC) in the undiluted exhaust for the car having the lowest fuel consumption. This MEC is then compared to the TLV. The TLV is the limit established by OSHA for exposure by a worker in any eight-hour work shift.

The conversion from an emission rate in g/km to mg/m³ was determined by the total volume of the undiluted exhaust and the total distance driven for each test. The volume of undiluted exhaust differs for each malfunction condition; generally as a function of the fuel consumption rate. In converting these data, a relationship was used which tends to correct all data to an equivalent undiluted exhaust flow rate equal to the lowest for any of the configurations evaluated. This was done in order to equalize the data to a common basis and eliminate the relative reduction obtained by configurations having high exhaust flow rates. The EPA has found this approach, for evaluating the unregulated emissions, to be of value for preliminary screening purposes.

TABLE 17. HIGHEST OF THE AVERAGED EMISSION RATES

	Emission Rate, mg/km (Except as Noted)					
	FTP		SET		HFET	
	Unmod.	Malf.	Unmod.	Malf.	Unmod.	Malf.
<u>Regulated Emissions</u>						
Hydrocarbons (THC), g/km	2.35	15.22	1.63	11.63	1.59	10.06
Carbon Monoxide, g/km	19.31	51.93	6.06	21.83	5.69	9.31
Oxides of Nitrogen, g/km	3.66	3.74	4.33	4.71	4.24	4.34
<u>Particulates</u>						
Total Particulates	114.55	222.29	78.53	144.61	80.23	119.78
Sulfate	1.11	2.50	0.49	1.49	0.62	1.11
<u>Compound Group Totals</u>						
Aldehydes & Ketones	73.5	254.5	37.6*	166.3	34.8	199.7
Individual Hydrocarbons	848.7	3566.4	674.3	2790.4	670.2	2492.3
Organic Sulfides	0.22	0.26	0.10	0.06	0.06	0.11
Organic Amines	0.08	0.40	0.10	0.35	0.10	0.28
<u>Other Compounds</u>						
Ammonia	5.72	16.60	2.78	10.64	5.63	10.18
Cyanide & Cyanogen	5.20	9.92	3.00	5.33	6.97	8.63
Hydrogen Sulfide	0.08	0.05	0.00	0.00	0.00	0.00
Tetramethyllead	0.00	0.00	0.00	0.00	0.00	0.00
Ethylene Dichloride	0.00	0.00	0.00	0.00	0.00	0.00
Tetraethyllead	0.00	0.00	0.00	0.00	0.00	0.00
Ethylene Dibromide	0.00	3.81	0.00	3.65	0.00	3.64
<u>Aldehydes & Ketones</u>						
Formaldehyde	66.77	206.24	34.77	136.53	30.87	173.17
Acetaldehyde	6.74	34.29	4.88	20.28	3.98	19.08
Acetone	0.71	12.05	0.35	6.21	0.20	5.91
Isobutyraldehyde	--	--	--	--	--	--
Methyl Ethyl Ketone	0.27	3.71	0.14	2.20	0.23	1.54
Hexanaldehyde	0.00	2.54	0.00	2.27	0.00	1.14
<u>Individual Hydrocarbons</u>						
Methane	98.72	352.98	52.39	133.09	51.29	79.69
Ethylene	247.81	368.66	208.62	386.31	207.63	352.88
Ethane	23.30	32.42	19.07	31.13	19.71	29.41
Acetylene	133.11	344.26	62.59	142.59	71.32	102.79
Propane	5.96	8.17	1.68	5.77	1.48	6.66
Propylene	132.21	260.04	108.27	281.85	105.40	252.48
Benzene	56.94	200.55	48.12	174.63	48.04	104.35
Toluene	235.15	2496.99	173.53	1769.45	165.40	1573.80

* One run only

TABLE 17 (Cont'd). HIGHEST OF THE AVERAGED EMISSION RATES

	Emission Rate, mg/km (Except as Noted)					
	FTP		SET		HFET	
	Unmod.	Malf.	Unmod.	Malf.	Unmod.	Malf.
<u>Organic Sulfides</u>						
Carbonyl Sulfide	0.18	0.26	0.08	0.06	0.03	0.07
Methyl Sulfide	0.04	0.10	0.02	0.01	0.03	0.04
Ethyl Sulfide	0.01	0.01	0.00	0.00	0.00	0.00
Methyl Disulfide	0.00	0.01	0.00	0.00	0.00	0.00
<u>Organic Amines</u>						
Monomethylamine	0.08	0.37	0.07	0.35	0.09	0.18
Monoethylamine	0.02	0.12	0.02	0.04	0.01	0.10
Trimethylamine	0.01	0.02	0.02	0.00	0.01	0.00
Diethylamine	0.00	0.00	0.00	0.00	0.00	0.00
Triethylamine	0.00	0.00	0.00	0.00	0.00	0.00
<u>Trace Elements</u> ^a						
Lead	20.26	35.38	30.80	25.02	17.50	25.08
Bromine	12.68	15.64	17.45	18.65	13.04	15.23
Phosphorus	0.23	0.28	0.28	0.23	0.17	0.15
Silicon	0.01	0.02	0.02	0.00	0.00	0.00
Cadmium	0.01	0.02	0.02	0.02	0.01	0.02
Aluminum	0.22	0.36	0.15	0.48	0.05	0.17
Sulfur	0.53	1.28	0.18	0.89	0.10	0.54
Sodium	0.06	0.11	0.13	0.11	0.06	0.32
Magnesium	0.02	0.05	0.04	0.04	0.02	0.02
Chlorine	7.58	6.69	6.52	5.97	6.44	7.91
Zinc	0.17	0.26	0.22	0.14	0.12	0.15
Copper	0.01	0.05	0.03	0.02	0.00	0.04
Nickel	0.00	0.00	0.00	0.00	0.00	0.00
Iron	4.75	15.23	2.17	20.32	1.23	5.63
Vanadium	0.01	0.01	0.01	0.01	--	0.01
Calcium	0.18	0.29	0.25	0.18	0.07	0.08

^a This table excludes elements having measured emissions values consistently below 0.01 mg/km.

TABLE 17 (Cont'd). HIGHEST OF THE AVERAGED EMISSION RATES

	Car Test Number					
	FTP		SET		HFET	
	Unmod.	Malf.	Unmod.	Malf.	Unmod.	Malf.
<u>Organic Sulfides</u>						
Carbonyl Sulfide	73	741	73	742	73	742
Methyl Sulfide	73	732	71, 73	742, 731	73	742
Ethyl Sulfide	71, 73	711, 731	All	All	All	All
Methyl Disulfide	--	731	All	All	All	All
<u>Organic Amines</u>						
Monomethylamine	71	712	71	712	71	731
Monoethylamine	74	711	71	721	71, 72, 73	731
Trimethylamine	72	711	71	All	73	All
Diethylamine	--	All	All	All	All	All
Triethylamine	--	All	All	All	All	All
<u>Trace Elements</u> ^a						
Lead	73	732	74	712	74	741
Bromine	71	712	74	743	71	741
Phosphorus	74	742	74	743	73	742
Silicon	71	711, 712, 742	73	All	All	All
Cadmium	71, 72	712	71, 74	741, 743, 712	71, 72, 74	741
Aluminum	73	732	73	732	71, 73	732
Sulfur	73	732	74	732	73	732
Sodium	71, 72	732	74	743, 732	71, 74	742
Magnesium	71, 73, 74	732	74	732	73, 74	712, 732, 741, 742, 743
Chlorine	71	741	74	741	72	721
Zinc	72	732	74	743	71	732
Copper	71, 72	732	71	732, 743	All	742
Nickel	All	All	All	All	All	All
Iron	72	732	73	732	73	732
Vanadium	71, 73	711, 721, 732	73	732	All	711, 712, 721, 731, 741
Calcium	74	732	74	743	73	743

^a This table excludes all elements having measured emissions values consistently below 0.01 mg/km.

TABLE 17 (Cont'd). HIGHEST OF THE AVERAGED EMISSION RATES

	Car Test Number					
	FTP		SET		HFET	
	Unmod.	Malf.	Unmod.	Malf.	Unmod.	Malf.
<u>Regulated Emissions</u>						
Hydrocarbons (THC), g/km	74	712	74	742	74	742
Carbon Monoxide, g/km	72	731	74	741	74	741
Oxides of Nitrogen, g/km	71	743	74	743	74	743
<u>Particulates</u>						
Total Particulates	73	732	74	732	73	742
Sulfate	73	732	74	732	73	732
<u>Compound Group Totals</u>						
Aldehydes & Ketones	73	712	73	712	73	732
Individual Hydrocarbons	74	742	74	742	74	742
Organic Sulfides	73	741	73	742	73	742
Organic Amines	71	712	71	712	71	731
<u>Other Compounds</u>						
Ammonia	73	742	74	742	74	742
Cyanide & Cyanogen	72	721	72	721	72	721
Hydrogen Sulfide	71	711, 731	A11	A11	A11	A11
Tetramethyllead	A11	A11	A11	A11	A11	A11
Ethylene Dichloride	A11	A11	A11	A11	A11	A11
Tetraethyllead	A11	A11	A11	A11	A11	A11
Ethylene Dibromide	A11	742	A11	742	A11	742
<u>Aldehydes & Ketones</u>						
Formaldehyde	73	712	73	732	73	732
Acetaldehyde	73	732	71	712	71	732
Acetone	71	732	71	712	74	732
Isobutyraldehyde	--	--	--	--	--	--
Methyl Ethyl Ketone	71	712	71	712	73	732
Hexanaldehyde	--	712	A11	712	A11	722
<u>Individual Hydrocarbons</u>						
Methane	72	741	74	741	74	741
Ethylene	74	741	74	742	74	742
Ethane	74	741	74	742	74	742
Acetylene	72	741	74	741	74	741
Propane	73	711	74	742	74	742
Propylene	74	742	74	742	74	742
Benzene	73	732	74	712	74	732
Toluene	74	732	74	742	74	742

The maximum emission rates are summarized and compared to the emissions standards and the TLV in Table 18. This table also includes several overall average emission rates for all four of the cars in the unmodified configuration. These values summarized in Table 18 are intended to provide some idea of the relative importance, based on toxicity, for some of the compounds evaluated. It should be emphasized, however, that definite conclusions are currently inappropriate for any compounds, except possibly those for which automotive source emission standards have been established. It should be recognized that the hazard level of a compound may change based on new findings in health effects research. This is especially a factor when a compound is changed from a toxic concern to a carcinogenic concern, such as is apparently occurring with formaldehyde. In the initial project, the ambient air standards were also reviewed for possible inclusion. Due to the varied ways in which the standards are expressed, however, there did not appear to be an appropriate method for including such standards in these comparative analyses.

There was no TLV available for leaded fuel-derived particulates. The value used in Table 18 for particulates was adapted from TLV values for other types of particulates. Direct applicability to particulates derived from leaded fuels is not known.

On the basis of the comparisons of the maximum and the overall average emissions rates to the emissions standards and to the threshold limit values, the currently regulated HC, CO and NO_x emissions appeared to be the most significant. Next in significance appear to be particulates (which included a significant amount of lead compounds) and formaldehyde. The EPA is currently evaluating the significance of the unregulated emissions as measured in this and other projects.

G. Comparison of Results with Previous Projects

Four 1970 model cars were evaluated in this project. Cars evaluated in previous projects have included: one 1977 non-catalyst car, four 1978 cars with an oxidation catalyst, and four 1978 or 1979 cars with a three-way catalyst. This section of the report compares selected average and maximum emissions values for each of these car groupings. These comparative data are presented in Table 19.

Average Emissions Rates - The average rates for the unmodified configuration are given in the upper half of Table 19. Hydrocarbons, carbon monoxide, particulates, aldehydes, and cyanides were significantly higher from the non-catalyst cars than from the cars with a catalyst. Ammonia was highest from the three-way catalyst cars. The three-way catalyst cars, however, had the lowest emissions rates for all three of the regulated emissions (HC, CO, and NO_x). With all of these cars, there were relatively insignificant emission rates of sulfates, organic amines, organic sulfides, and hydrogen sulfide.

TABLE 18. RELATIVE IMPORTANCE OF THE FTP EMISSION RATES

Maximum Emission Rates in Any Configuration						
	Maximum Emission Rate (MER) in mg/km	Emission Standard for 1985 in mg/km	Equivalent MER in Undiluted Exhaust in mg/m ³ (MEC) ^a	Threshold Limit Value ³ (TLV) in mg/m ³		Ratio of MEC to TLV
				OSHA (9)	R ^b	
<u>Regulated Emissions</u>						
Hydrocarbons	15,200	255	11,400	--	--	--
Carbon Monoxide	59,000	2,113	44,000	55	--	800
Oxides of Nitrogen	3,700	622	2,800	9	--	300
<u>Particulates</u>						
Total Particulates	222	124 ^c	165	--	1 ^d	165 ^d
Sulfate	3	--	2	--	-	2
<u>Compound Group Totals</u>						
Aldehydes & Ketones	255	--	190	--	--	--
Organic Sulfides	<1	--	<1	--	10	<1
Organic Amines	<1	--	<1	--	>10	<1
<u>Other Compounds</u>						
Ammonia	17	--	13	35	--	1
Cyanide & Cyanogen	10	--	8	--	5	2
Hydrogen Sulfide	<1	--	<1	--	10	<1
Formaldehyde	210	--	160	4	--	40
<u>Overall Average Emission Rates in the Unmodified Configuration</u>						
	Average Emission Rate (AER) in mg/km	Emission Standard for 1983 in mg/km	Estimated AER in Undiluted Exhaust in mg/m ³ (AEC)	Threshold Limit Value (TLV) in mg/m ³		Ratio of AEC to TLV
				OSHA (9)	R ^b	
<u>Regulated Emissions</u>						
Hydrocarbons	1,900	255	1,400	--	--	--
Carbon Monoxide	17,100	2,113	12,800	55	--	230
Oxides of Nitrogen	2,600	622	1,950	9	--	220
<u>Other Emissions</u>						
Total Particulates	99	124	75	--	1 ^d	75 ^d
Formaldehyde	35	--	26	4	--	7

^aDerived on a wet basis using the following approximate calculation:

$$\text{mg/m}^3 = \text{Conversion Factor} \times \text{mg/km. C.F.} = \text{Distance/Total Volume} \times \text{Dilution Factor}$$

^bBased on values for some similar or related compounds as set by OSHA(9) or recommended by the 1968 American Conference of Governmental Industrial Hygienists(10).

^cValue for diesel cars.

^dTLV used may not be applicable to particulates formed from leaded fuel.

TABLE 19. COMPARISON WITH RESULTS FROM PREVIOUS PROJECTS

	Average FTP Emission Rates in the Unmod. Conf., mg/km			
	Non-Catalyst		Oxid. Cat.	3-Way Cat
	1970 ^{a,b}	1977 ^a	1978 ^a	1978 & 79 ^c
<u>Regulated Emissions</u>				
Hydrocarbons	1,900	730	280	120
Carbon Monoxide	17,100	11,100	3,150	1,900
Oxides of Nitrogen	2,600	1,210	860	480
<u>Particulates</u>				
Total Particulates	99 ^b	31	6	9
Sulfates	<1	<1	<1	1
<u>Compound Group Totals</u>				
Aldehydes & Ketones	37	13	3	1
Organic Sulfides	<1	<1	<1	<1
Organic Amines	<1	<1	<1	<1
<u>Other Compounds</u>				
Ammonia	4	3	3	21
Cyanide & Cyanogen	3	2	<1	<1
Hydrogen Sulfide	<1	<1	<1	<1
<u>Maximum Emissions Rates, mg/km^{c,d}</u>				
<u>Regulated Emissions</u>				
Hydrocarbons	15,200	10,800	2,200	2,150
Carbon Monoxide	59,000	24,700	52,900	57,500
Oxides of Nitrogen	3,700	2,250	4,200	2,500
<u>Particulates</u>				
Total Particulates	222 ^b	48	18	29
Sulfates	3	4	17	27
<u>Compound Group Totals</u>				
Aldehydes & Ketones	255	228	13	6
Organic Sulfides	<1	<1	2	6
Organic Amines	<1	<1	<1	<1
<u>Other Compounds</u>				
Ammonia	17	3	57	318
Cyanide & Cyanogen	10	7	6	112
Hydrogen Sulfide	<1	<1	4	7

^aData for four 1970 model cars are from this project. Data for one 1977 non-catalyst, four oxidation catalyst, and four 3-way catalyst cars are from previous contracts, 68-03-2499, 68-03-2588 and 68-03-2692.

^bLeaded fuel used in the 1970 cars and unleaded fuel in all others.

^cThe highest of the average values were used in this comparison.

^dFTP results were used for the regulated emissions.

Maximum Emission Rates - The maximum emissions rates for all configurations evaluated are given in the lower half of Table 19. The cars with a catalyst produced significantly lower rates of hydrocarbons and aldehydes and significantly higher rates of sulfates, ammonia and organic sulfides. The three-way catalyst cars produced ammonia and cyanide emission rates which were an order of magnitude, or more, higher than the rates from the other car groups.

Summary of the Comparisons - With the cars in the unmodified configuration (tuned-up to manufacturer's specifications), the cars without a catalyst, relative to those with a catalyst, produced higher rates of all emissions measured in these various projects, with the exception of ammonia. In the malfunction configurations, the cars without a catalyst produced the highest rates of hydrocarbons, particulates and aldehydes. All of the car groups, under some malfunction, produced essentially the same maximum rates of carbon monoxide, oxides of nitrogen and organic amines. Catalyst-equipped cars produced the highest rates of sulfates, organic sulfides, ammonia, and hydrogen sulfide. The cars with a three-way catalyst produced the highest rates of cyanides. It can be concluded that the catalyst significantly lowered the overall net emissions rate when the car was tuned-up to manufacturer's specifications. Under some malfunction conditions, however, the overall benefits from a catalyst were greatly reduced.

LIST OF REFERENCES

1. Urban, C. M., "Regulated and Unregulated Exhaust Emissions from Mal-functioning Non-Catalyst and Oxidation Catalyst Gasoline Automobiles," Final Report to Environmental Protection Agency under Contract No. 68-03-2499, January 1980.
2. Urban, C. M., "Regulated and Unregulated Exhaust Emissions from Mal-functioning Three-Way Catalyst Gasoline Automobiles," Final Report to Environmental Protection Agency under Contract No. 68-03-2588, January 1980.
3. Urban, C. M., "Regulated and Unregulated Exhaust Emissions from a Mal-functioning Three-Way Catalyst Gasoline Automobile," Final Report to Environmental Protection Agency under Contract No. 68-03-2692, January 1980.
4. Smith, L. R., "Characterization of Emissions from Motor Vehicles Designed for Low NO_x Emissions," Final Report to Environmental Protection Agency under Contract 68-02-2497, July 1980.
5. Dietzmann, H. E., et al, "Analytical Procedures for Characterizing Unregulated, Pollutant Emissions from Motor Vehicles," Report EPA 600/2-79-017, February 1979.
6. Code of Federal Regulations, Title 40, Chapter 1, Part 85, Subpart H, Sections applicable to 1979 Model Year Light-Duty Vehicles.
7. Congested Freeway Driving Schedule (Appendix VIII in the Recommended Practice for Measurement of Exhaust Sulfuric Acid Emission from Light-Duty Vehicles and Trucks, November 1976.
8. Highway Fuel Economy Driving Schedule (Federal Register, Vol. 41, No. 100, May 21, 1976, Appendix I).
9. U.S. HEW "Registry of Toxic Effects of Chemical Substances," 1976 and 1978 Editions.
10. Proceedings of the 1968 American Conference of Governmental Industrial Hygienists as reported in the Fifth Edition of the "Matheson Gas Data Book."

APPENDICES

- A - GENERAL INFORMATION
- B - SUMMARIES OF VEHICLE TESTING RESULTS
- C - FTP INDIVIDUAL SAMPLE EMISSIONS RESULTS
- D - COMPUTER PRINTOUTS OF THE REGULATED
EMISSIONS TEST RESULTS
- E - SHORT-TEST PROCEDURES RESULTS
- F - AVERAGE VALUES FOR ALL CONFIGURATIONS

APPENDIX A

GENERAL INFORMATION

- A-1 Measurement Procedure for Leaded Fuel Components
- A-2 Short Test Procedures
- A-3 Calculations for Unregulated Emissions

APPENDIX A-1.

THE MEASUREMENT OF LEADED FUEL COMPONENTS IN EXHAUST EMISSIONS

The measurement of leaded fuel components (tetraethyllead (TEL), tetramethyllead (TML), ethylene dibromide (EDB), and ethylene dichloride (EDC)) in exhaust is accomplished by direct bag analysis using a gas chromatograph equipped with an electron capture detector. A limited number of validation experiments were conducted to insure the accuracy and reliability of the procedure. Contacts were made with key individuals at EPA, Research Triangle Park to implement this analysis. The detection limits for this procedure are: 2 ppb TML; 5 ppb EDC; 5 ppb EDB; and 20 ppb TEL.

Analytical System

The analysis for leaded fuel components in exhaust is conducted using a gas chromatograph equipped with an electron capture detector. The system was designed for bag analysis and uses the CVS bag samples. The system employs two pneumatically-operated, electrically-controlled Seiscor valves, one in a gas sampling valve configuration and the other in a backflush configuration. Figure A-1 illustrates the flow schematic of the analytical system. A stripper column is included as a precautionary measure to prevent unwanted species from entering the analytical column.

The analytical column selected for this separation was a 20' x 1/8" Teflon column packed with 5% Carbowax 20M on 60/80 Mesh Gas Chrom Z. The gas chromatograph oven is maintained at 35°C during analysis. The system is in the inject configuration (Figure A-1) for 14 minutes followed by 14 minutes in the backflush configuration. The total analysis time is 25-30 minutes. A typical separation of the leaded components is presented in Figure A-2. The specific GC operating parameters for this separation are presented in Table A-1.

Control System

The control of the two Seiscor valves is accomplished by ATC timers and ASCO electric solenoid valves. The electrical schematic for the control of the Seiscor valves using these timers and electric solenoid valves is shown in Figure A-3. The flow schematic for the vacuum and pressure lines to the Seiscor valves is presented in Figure A-4.

Equipment

This analysis is performed using a gas chromatograph equipped with an electron capture detector. The gas chromatograph, recorder and data acquisition system are major components in the detection system. A control console was fabricated to house the mechanical hardware items that are necessary for the proper operation of the analysis system. The major items that are included in each of these systems are listed as follows:

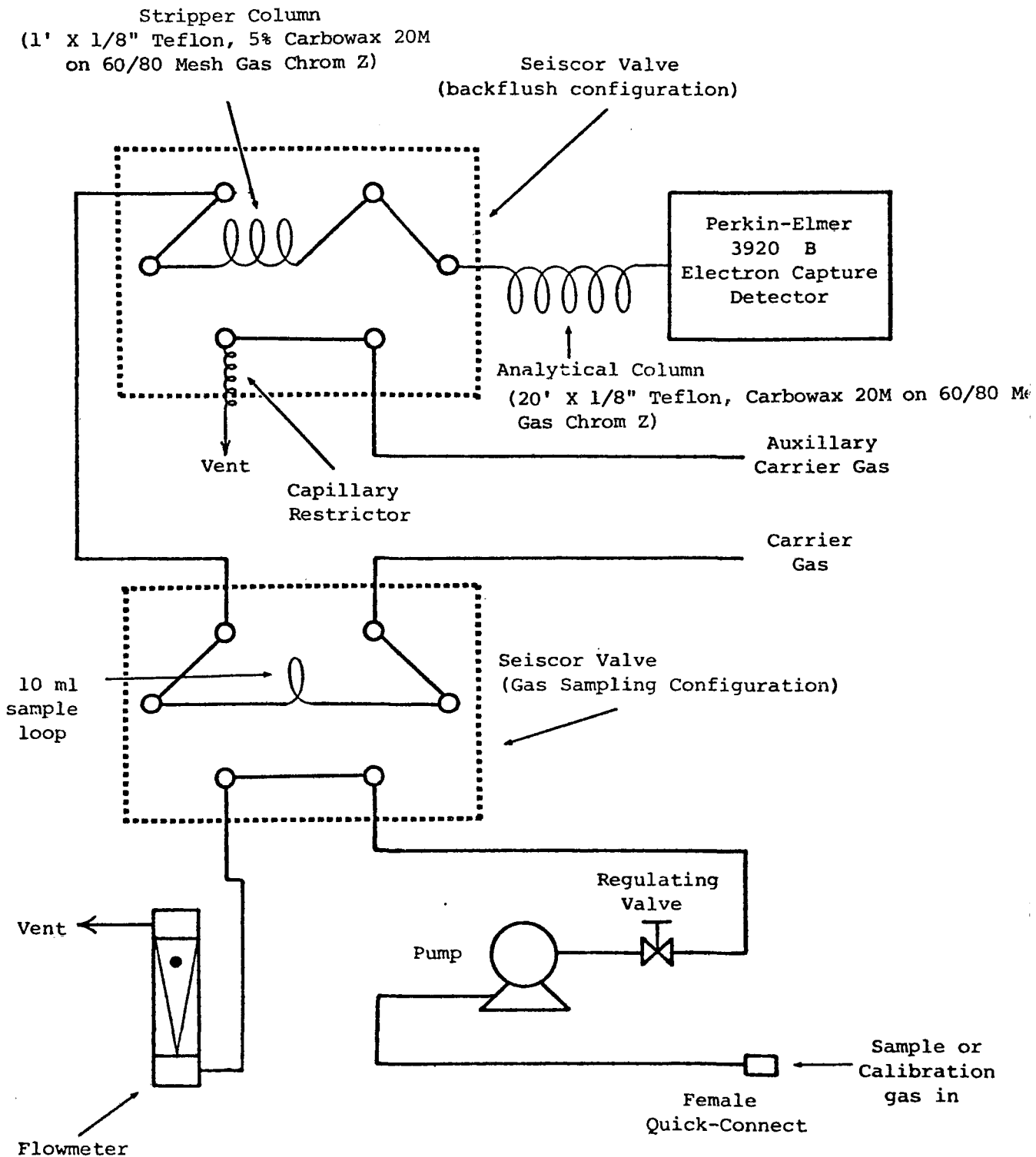


Figure A-1. Leaded fuel components analytical flow schematic
(Inject sample or calibration gas into system)

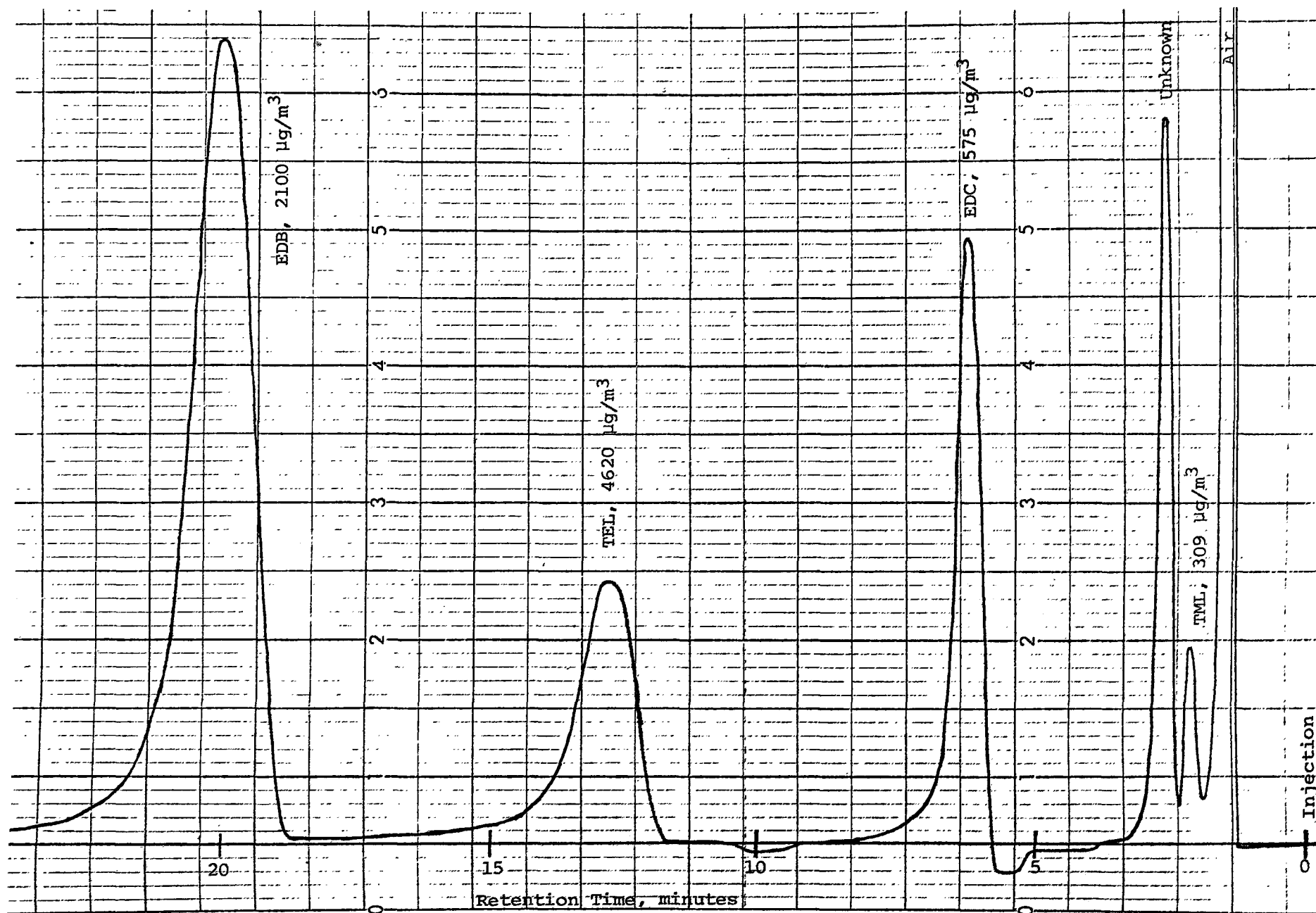


Figure A-2. Typical separation of the leaded fuel components

TABLE A-1. LEADED FUEL COMPONENTS GAS CHROMATOGRAPH OPERATING PROCEDURES

Gas Chromatograph (oven):	Varian Aerograph Series 1400
Detector Type:	Electron Capture Detector (Perkin-Elmer)
Gas Sampling Valve:	Seiscor Model VIII (GSV Configuration)
Backflush Valve:	Seiscor Model VIII (BF Configuration)
Sample Loop Size:	10 ml
Column Temperature:	35°C
Detector Temperature:	325°C
Injection Temperature:	Ambient
Carrier Gas:	Argon 95%/methane 5%
Carrier Gas Flow:	35 cc/min
Column Dimensions:	20' x 1/8" Teflon
Column Material:	5% Carbowax 20M on 60/80 Mesh Gas Chrom Z
Stripper Column:	1' x 1/8" Teflon column packed with 5% Carbowax 20M on 60/80 Mesh Gas Chrom Z

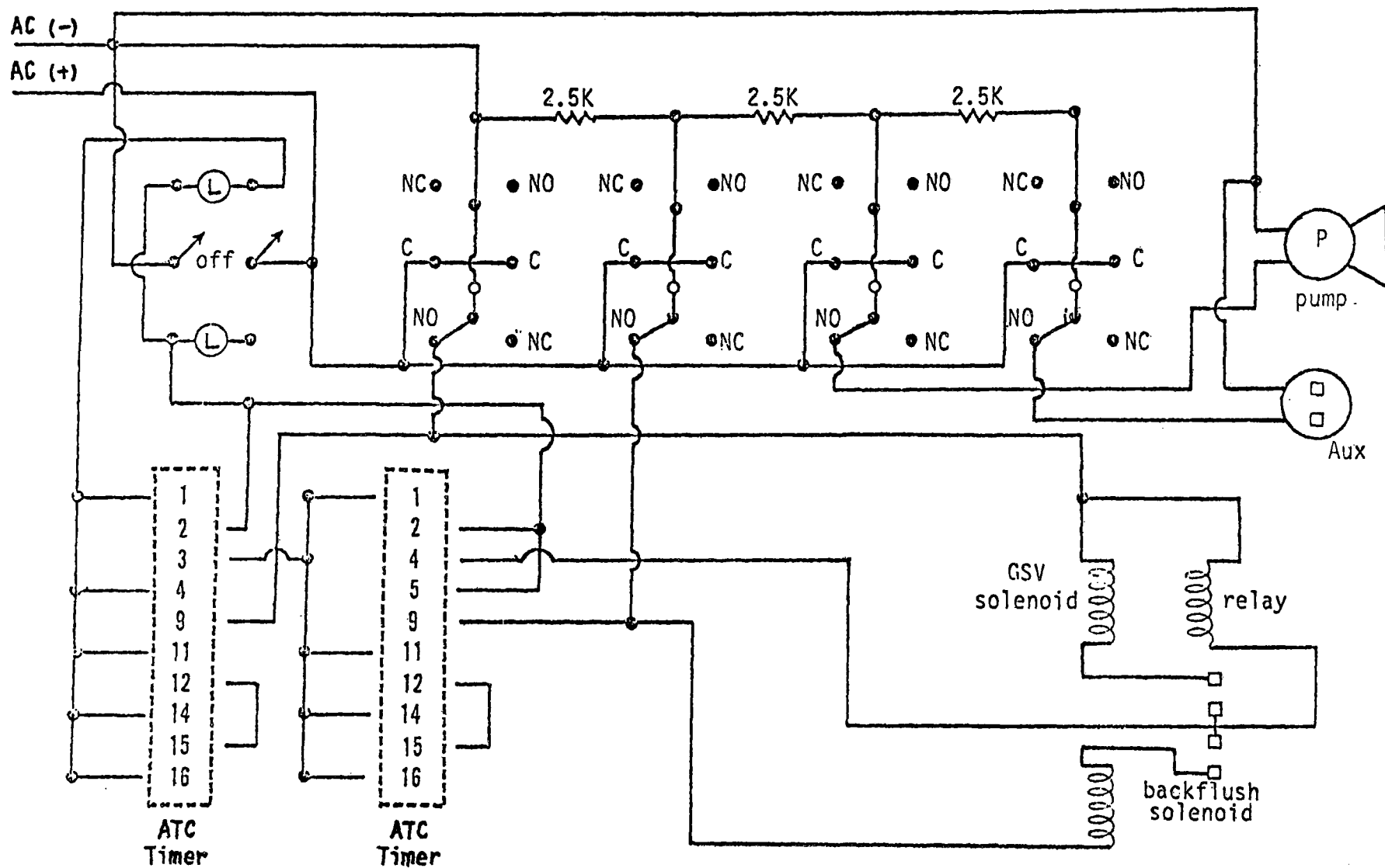
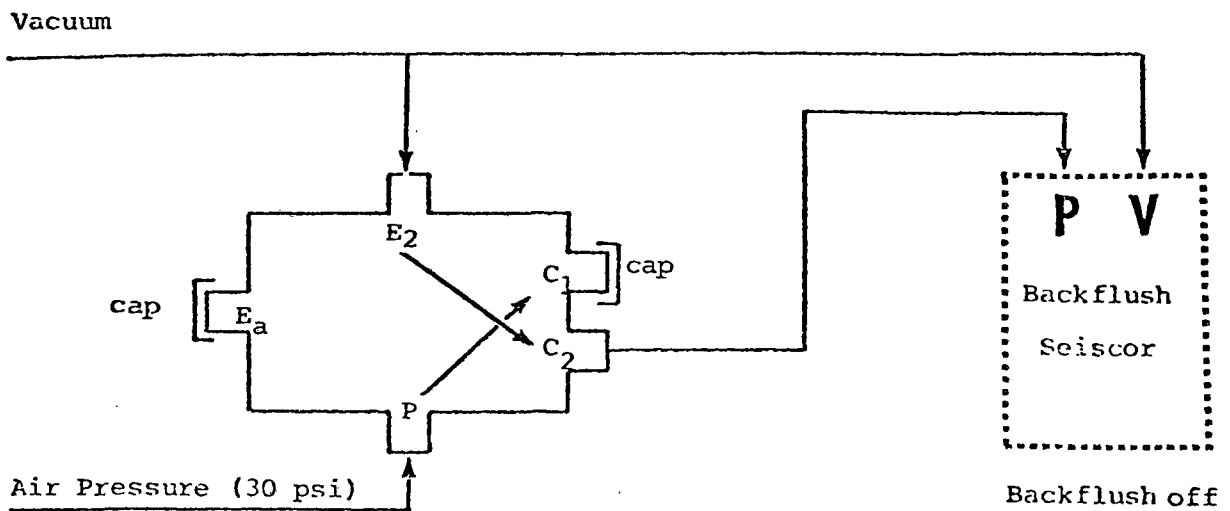
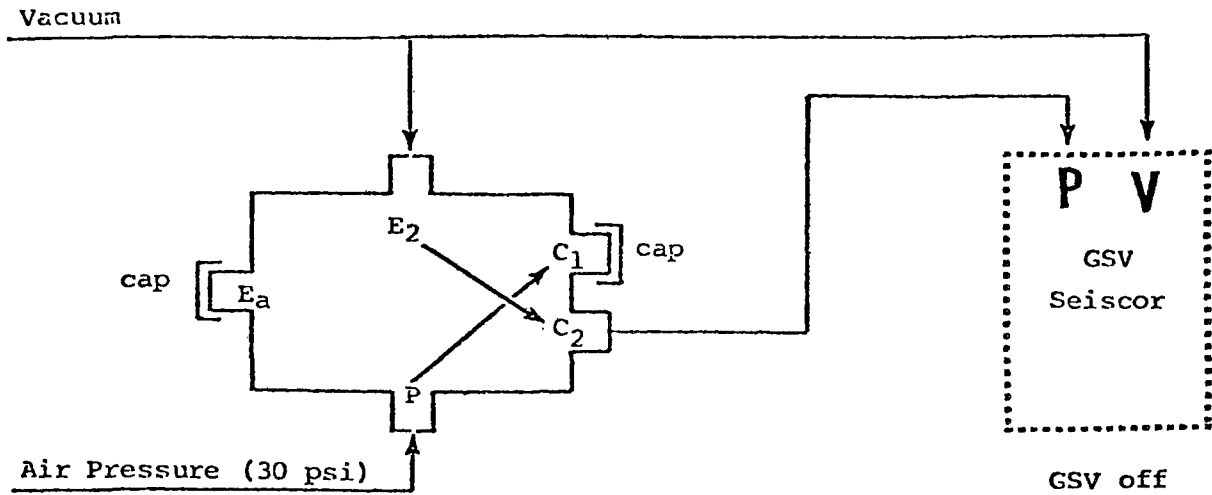


Figure A-3. Electrical schematic for leaded fuel components analysis system



Note: Schematic shows both valves de-energized.

Figure A-4. Flow schematic in electric solenoid valves

Gas Chromatograph

1. Varian Aerograph Series 1400 chromatograph
2. Perkin-Elmer electron capture detector
3. Soltec Model B-281 recorder
4. Hewlett-Packard Model 3354C GC computer system
5. Hewlett-Packard Model 1865A A/D Converter
6. Analytical column, 20' x 1/8" Teflon, 5% Carbowax 20M on 60/80 Mesh Gas Chrom Z.

Control Console System

1. Seiscor valve - gas sampling configuration
2. Seiscor valve - backflush configuration
3. ATC timers, Model 3254A346A10PX (2 ea)
4. ACSO solenoid valve, Model 834501 (2 ea)
5. Brooks flowmeter, R-2-15-A w/SS float, 0-150 scale
6. Metal Bellows MB-155 pump
7. Female quick-connect, stainless steel
8. Nupro Model 2M stainless steel regulating valve
9. Stainless steel tubing (0.01" ID) for capillary restrictor
10. Miscellaneous stainless steel, copper and Teflon tubing (1/8" and 1/16")
11. Miscellaneous stainless steel and brass unions, tees, etc.
12. Bud Classic II control console cabinet, 14" x 19" panel
13. Miscellaneous electrical on-off switches
14. Stripper column, 1' x 1/8" Teflon, 5% Carbowax 20M on 60/80 Mesh. Gas Chrom Z.

Calculations

Standards are prepared daily by injecting known concentrations of tetramethyllead, tetraethyllead, ethylene dichloride, and ethylene dibromide in isooctane into a Tedlar bag containing 10% of zero air. The leaded fuel components in exhaust are quantified by a direct comparison of sample peak areas to the standard peak areas.

$$\text{Conc. in Sample Bag, } \mu\text{g/m}^3 = \frac{\text{Conc. of Std, } \mu\text{g/m}^3 \times \text{Peak Area Sample}}{\text{Peak Area Std.}}$$

APPENDIX A-2.
I-M SHORT TEST DRIVER DATA SHEET
11-5830-005

Test No. _____ Date _____ By _____ Car Make _____

NOTE: All tests are to be run with the hood open and the cooling fan on.

1. WARM-UP to normal operating condition:

If engine is cold - run UDDS

If engine is warm - run 505

2. 50 MPH - Run 50 mph in Drive or 3rd gear (FTP Inertia and Hp Setting):

Gear Used - _____

Minute 1 - check and adjust load:

HP _____ Inertia _____

Minute 2 - stabilize:

Engine rpm

Minute 3 - measure HC and CO

3. 4-MODE IDLE TEST - Idle 6 minutes and then measure HC and CO
(Set minimum inertia during the 6 minutes).

(30 seconds per mode)

(a) Idle in neutral

(a)

(b) 2500 RPM in neutral

(b)

(c) Idle in neutral

(c)

(d) Idle in Drive (or with clutch in)

(d)

RPM

4. 2-MODE TEST - Run 30 MPH (3 minutes total) and set dynamometer at 9.0 actual HP with minimum inertia - Idle 6 minutes and then measure HC & CO (30 seconds per mode)

(a) 30 mph (Drive or 3rd gear):

(b) Idle in Neutral:

RPM

5. PROPANE ENRICHMENT* - Make a preliminary check. Adjust propane flow rate until the engine speed peaks out (and starts to decrease) at Idle.

Run 30 mph for two minutes

Idle in Neutral w/o propane for two minutes

Record RPM in each of the following conditions (each mode should take about 30 seconds):

a. PCV system in place w/o propane

(a)

b. PCV system in place with propane

(b)

c. PCV valve removed from grommet w/o propane

(c)

d. PCV valve removed from grommet with propane

(d)

e. PCV fresh air line opened w/o propane

(e)

f. PCV fresh air line opened with propane

(f)

Max. RPM	
Neutral	Drive

NOTE: Repeat the two minutes at 30 mph and at idle, and "a" through "f" in Drive, in cars with an automatic transmission. Brake to be on.

* Propane into air horn

APPENDIX A-3. CALCULATIONS FOR UNREGULATED EMISSIONS

This appendices documents the calculational methods used for the unregulated emissions. All values not defined (i.e., CVS FLOW, VOL, etc.) are obtained from the computer printouts for the regulated emissions. Example printout is included as Table 1.

A. Individual Hydrocarbons, Nickel Carbonyl, N₂O and H₂S

1. For FTP Evaluations only, convert 2-Bag UDDS to Equivalent 1-Bag UDDS

$$\text{PPM 12} = \frac{\text{PPM}_1 \times \text{CVS FLOW}_1 + \text{PPM}_2 \times \text{CVS FLOW}_2}{\text{CVS FLOW}_1 + \text{CVS FLOW}_2}$$

$$\text{PPM 34} = \frac{\text{PPM}_3 \times \text{CVS FLOW}_3 + \text{PPM}_4 \times \text{CVS FLOW}_4}{\text{CVS FLOW}_3 + \text{PPM FLOW}_4}$$

2. Convert PPM to $\mu\text{g}/\text{m}^3$:

$$\mu\text{g}/\text{m}^3 = 35.32 \times \text{DENSITY} \times \text{PPM}$$

Density, g/ft ³			
Methane CH ₄	- 18.86	Propane C ₃ H ₈	- 17.29
Ethylene C ₂ H ₄	- 16.50	Propylene C ₃ H ₆	- 16.50
Ethane C ₂ H ₆	- 17.68	Benzene C ₆ H ₆	- 15.33
Acetylene C ₂ H ₂	- 15.33	Toluene C ₇ H ₈	- 15.49
H ₂ S	- 40.12	N ₂ O	- 51.82
NH ₃	- 20.05	Ni(CO) ₄	-200.99

B. Calculation of mg/km

$$\text{mg/km} = ((\text{EXH} \times \text{SCF} - \text{BG} \times \text{DFC}) \times \text{VOL} \div \text{KM}) \div 1000$$

Calculations were performed using a Hewlett Packard HP-65 Programmable Calculator

Dry (DFC) and (SFC) was used for all unregulated emissions except: IHC, N₂O and Ni (CO)₄

DFC and SCF are obtained from the computer print-out for regulated emissions. (See Tables 1 and 2.)

C. Metals and Other Elements

$$\text{COMPONENT WEIGHT ON FILTER} = \mu\text{g}/\text{cm}^2 \times \text{EFF. FILTER AREA}$$

$$\text{EFF. FILTER AREA} = 14.3 \text{ cm}^2$$

$$\text{COMPONENT } \mu\text{g}/\text{m}^3 = \text{C.W.O.F.} \div \text{TOTAL WT.} \times (\mu\text{g}/\text{m}^3 \text{ for Total Wt.})$$

APPENDIX A- 3 (Cont'd). CALCULATIONS FOR UNREGULATED EMISSIONS

D. Calculation of Average Temperature and Oxygen

$$\text{Average} = \frac{\text{INTEGRATOR COUNTS}}{6.994 \times \text{SECONDS}} \times \text{FULL SCALE VALUE}$$

= % for Oxygen

= MV for Catalyst Temperature

E. Calculation for 4-FTP

$$\text{Composite 4-FTP} = 0.43 \times (\text{Value for 1\&2}) + 0.57 \times (\text{Value for 3\&4})$$

Appendix A-3 (Cont'd). CALCULATIONS FOR UNREGULATED EMISSIONS
TABLE 1. COMPUTER PRINTOUT NOMENCLATURE FOR FOUR-BAG FTP

PVM - FTP VEHICLE EMISSIONS RESULTS - MALFUNCTION CONDITION
PROJECT

TEST NO.	RUN	VEHICLE NO.	TEST WEIGHT	KG (LBS)
VEHICLE MODEL		DATE	ACTUAL ROAD LOAD	KG (HP)
ENGINE L (CID)		BAG CART NO.	GASOLINE EM-	
TRANSMISSION A3		DYNO NO.	ODOMETER	KM (MILES)
GVW KG (LBS)		CVS NO.		

BAROMETER	MM HG (IN HG)	DRY BULB TEMP.	DEG C (DEG F)	
RELATIVE HUMIDITY	PCT	ARS. HUMIDITY	GM/KG	NOX HUMIDITY CORRECTION FACTOR
BAG RESULTS				
BAG NUMBER		1	2	3
DESCRIPTION		COLD TRANSIENT	STABILIZED	HOT TRANSIENT
				STABILIZED

BLOWER DIF P MM. H2O(IN. H2O)
BLOWER INLET P MM. H2O(IN. H2O)
BLOWER INLET TEMP. DEG. C(DEG. F)
BLOWER REVOLUTIONS
CVS FLOW STD. CU. METRES(SCF)
HC SAMPLE METER/RANGE/PPM
HC BCKGRD METER/RANGE/PPM
CO SAMPLE METER/RANGE/PPM
CO BCKGRD METER/RANGE/PPM
CO2 SAMPLE METER/RANGE/PCT
CO2 BCKGRD METER/RANGE/PCT
NOX SAMPLE METER/RANGE/PPM
NOX BCKGRD METER/RANGE/PPM
DILUTION FACTOR

HC CONCENTRATION PPM
CO CONCENTRATION PPM
CO2 CONCENTRATION PCT
NOX CONCENTRATION PPM
HC MASS GRAMS
CO MASS GRAMS
CO2 MASS GRAMS
NOX MASS GRAMS

HC GRAMS/KM
CO GRAMS/KM
CO2 GRAMS/KM
NOX GRAMS/KM

FUEL CONSUMPTION BY CR L/100KM

RUN TIME SECONDS
AVG. EXH. OXYGEN PERCENT
CATALYST AVG. TEMP. DEG. C
CATALYST MAX. TEMP. DEG. C
MEASURED DISTANCE KM
OFC, WET (DRY)
SCF, WET (DRY)
VOL (SCM)
KM (MEASURED)

COMPOSITE RESULTS

TEST NUMBER
BAROMETER MM HG
HUMIDITY G/KG
TEMPERATURE DEG C

TOTAL FUEL SULFUR MG/KM
AVG. EXH. OXYGEN PCT
CATALYST AVG. TEMP. DEG C
CATALYST MAX. TEMP. DEG C

CARBON DIOXIDE G/KM
FUEL CONSUMPTION L/100KM
HYDROCARBONS (THC) G/KM
CARBON MONOXIDE G/KM
OXIDES OF NITROGEN G/KM

3-BAG (4-BAG)
()
()
()
()
()

APPENDIX A- 3(Cont'd). CALCULATION FOR UNREGULATED EMISSIONS
TABLE 2. DEFINITION OF COMPUTER PRINTOUT NOMENCLATURE

FOR FOUR-BAG AND SINGLE-BAG

REGULATED EMISSIONS

The following are primarily excerpts taken from the computer program:

AVG. EXH. OXYGEN: Direct printout of an input

CATALYST AVG. AND MAX. TEMPS.: Input converted to °C and printed-out

C DFC = DILUTION FACTOR CORRECTION DFC = FOR WET SAMPLES DFCD = FOR DRY

$$DF(J) = 13.4 / (YC(2,J) + ((YH(2,J) + CC(2,J)) / 10000.))$$

$$DFC(J) = 1 - 1/DF(J)$$

C CALCULATE DFC, VOL. KM FOR BAGS 1+2 AND 3+4

C DF = TOTAL CVS FLOW / EXHAUST FLOW = AIR + EXH / EXH

C DFC = 1 - 1/DF = 1 - EXH/(AIR+EXH) = AIR/(AIR+EXH)

$$DFC12 = (DFC(1)*VMIX(1) + DFC(2)*VMIX(2)) / (VMIX(1) + VMIX(2))$$

$$DFC34 = (DFC(3)*VMIX(3) + DFC(4)*VMIX(4)) / (VMIX(3) + VMIX(4))$$

IF(RH.LT.20) RH = 20

$$DFCD12 = DFC12 * (1.0 - 0.000323*(RH - 20))$$

$$DFCD34 = DFC34 * (1.0 - 0.000323*(RH - 20))$$

C SCF = SAMPLE CORRECTION FACTOR FOR WATER REMOVAL SCF = FOR WET SCFD=DRY

$$SCF12 = 1.000$$

$$SCF34 = 1.000$$

$$SCFD12 = (SCFD(1)*VMIX(1)+SCFD(2)*VMIX(2)) / (VMIX(1) + VMIX(2))$$

$$SCFD34 = (SCFD(3)*VMIX(3)+SCFD(4)*VMIX(4)) / (VMIX(3) + VMIX(4))$$

TOTAL FUEL SULFUR:

C TFS = TOTAL FUEL SULFUR IN MG/KM

C TFS = L/100KM * PCT * G/ML * 1000ML/L * 0.01G/GPCT * 1000MG/G

$$TFS = CBFM * FSWPCT * FPPG * 100.$$

C CALCULATE 4-BAG EMISSIONS AND FUEL CONSUMPTION

C 4-BAG = 0.43*(BAG1+BAG2)/(MILES1+MILES2)+0.57*(BAG3+BAG4)/(MILES3+MILES4)

$$DISTA = MILES(1) + MILES(2)$$

$$DISTB = MILES(2) + MILES(3)$$

$$DISTC = MILES(3) + MILES(4)$$

$$HCWM4 = 0.43*((HCM(1)+HCM(2)) / DISTA) + 0.57*((HCM(3)+HCM(4)) / DISTC)$$

$$COWM4 = 0.43*((COM(1)+COM(2)) / DISTA) + 0.57*((COM(3)+COM(4)) / DISTC)$$

$$CO2WM4 = 0.43*((CO2M(1)+CO2M(2))/DISTA) + 0.57*((CO2M(3)+CO2M(4)) / DISTC)$$

$$NOXWM4 = 0.43*((NOXM(1)+NOXM(2))/DISTA) + 0.57*((NOXM(3)+NOXM(4)) / DISTC)$$

$$CBFE4 = 2421. / (.866*HCWM4 + .429*COWM4 + .273*CO2WM4)$$

APPENDIX B

SUMMARIES OF VEHICLE TEST RESULTS

TABLE B-1. CAR 711 - RICH BEST IDLE
1970 OLDSMOBILE DELTA 88

		EMISSION RATE, MG/KM (Except as Noted)								
		UNMODIFIED			WITH MALFUNCTION CONDITION					
		FTP	SET	HFET	FTP	SET	HFET	FTP	SET	HFET
Test Number,	PVM-ST	711-11	711-12	711-13	711-21	711-22	711-23	711-31	711-32	711-33
Barometer,	mm hg	743.7	743.2	742.7	744.0	743.5	743.5	746.0	745.5	745.2
Humidity,	g/kg	10.1	9.9	9.9	6.7	5.8	5.6	6.9	6.8	12.1
Temperature,	°C	24.4	25.0	25.0	26.1	28.3	28.9	25.6	24.4	26.7
Total Fuel Sulfur, mg/km		33.70	23.36	20.43	33.72	23.46	20.30	33.88	23.31	20.07
Avg. Exh. Oxygen, %		1.03	1.15	0.94	--	0.65	0.77	0.50	0.60	0.68
Carbon Dioxide, g/km		449.3	322.3	281.0	418.4	313.4	277.4	416.2	308.4	272.6
Fuel Cons., l/100 km		20.70	14.35	12.55	20.71	14.41	12.47	20.81	14.32	12.33
<u>Regulated Emissions</u>										
Hydrocarbons (THC), g/km		1.61	0.96	1.01	1.91	1.02	0.91	1.99	1.09	0.97
Carbon Monoxide, g/km		19.46	6.89	6.30	38.67	13.45	7.54	41.34	15.09	8.31
Oxides of Nitrogen, g/km		2.26	3.01	3.27	2.18	2.99	3.22	2.17	2.95	3.64
<u>Particulates</u>										
Total Particulates		111.71	71.18	73.27	92.21	65.41	53.69	85.02	57.79	53.76
Sulfate		0.48	0.49	0.32	0.55	0.43	0.24	0.71	0.41	0.09
Sulfate as % of TFS, %		0.47	0.70	0.52	0.54	0.61	0.39	0.70	0.59	0.15
<u>Compound Group Totals</u>										
Aldehydes & Ketones		43.4	31.3	24.6	45.7	31.6	30.9	43.2	28.9	34.3
Individual Hydrocarbons		868.3	512.1	439.4	948.9	549.8	480.7	991.2	602.0	513.6
Organic Sulfides		0.09	0.02	0.00	0.03	0.00	0.00	0.03	0.00	0.00
Organic Amines		0.04	0.11	0.08	0.08	0.07	0.00	0.28	0.06	0.10
<u>Other Compounds</u>										
Ammonia		2.73	1.77	2.99	2.11	4.67	2.83	3.85	4.89	3.62
Cyanide & Cyanogen		3.36	1.42	6.46	6.29	2.32	9.16	4.85	1.57	7.10
Hydrogen Sulfide		0.15	0.00	0.00	0.00	0.00	0.00	0.40	0.00	0.00
Tetramethyllead		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ethylene Dichloride		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tetraethyllead		--	--	--	--	--	--	--	--	--
Ethylene Dibromide		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

TABLE B-1. CAR 711 - RICH BEST IDLE (Cont'd)
1970 OLDSMOBILE DELTA 88

		EMISSION RATE, MG/KM (Except as Noted)								
		UNMODIFIED			WITH MALFUNCTION CONDITION					
		FTP	SET	HFET	FTP	SET	HFET	FTP	SET	HFET
Test Number,	PVM-ST	711-11	711-12	711-13	711-21	711-22	711-23	711-31	711-32	711-33
<u>Aldehydes and Ketones</u>										
Formaldehyde		36.55	27.69	21.20	30.15	27.25	27.14	32.25	25.86	29.83
Acetaldehyde		5.72	3.31	3.43	5.60	4.24	3.80	6.61	2.75	4.32
Acetone		0.64	0.00	0.00	9.74	0.00	0.00	3.86	0.00	0.00
Isobutyraldehyde		--	--	--	--	--	--	--	--	--
Methyl Ethyl Ketone		0.53	0.28	0.00	0.25	0.11	0.00	0.47	0.29	0.15
Hexanaldehyde		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Aldehydes and Ketones		43.4	31.3	24.6	45.7	31.6	30.9	43.2	28.9	34.3
Total as % of THC,	%	2.7	3.3	2.4	2.4	3.1	3.4	2.2	2.7	3.5
<u>Individual Hydrocarbons</u>										
Methane		106.91	45.89	36.14	157.82	69.39	51.78	166.05	80.70	59.28
Ethylene		168.43	137.13	109.69	217.19	154.65	142.96	229.92	165.78	150.28
Ethane		16.05	13.00	11.19	20.12	14.51	13.87	20.93	15.74	15.28
Acetylene		128.31	65.47	55.88	166.93	89.96	75.54	185.04	101.35	83.18
Propane		2.23	1.19	0.78	2.05	1.07	0.99	14.29	9.04	4.36
Propylene		68.20	55.14	44.71	82.57	58.92	57.07	87.99	64.43	61.91
Benzene		59.94	44.65	35.25	79.49	50.22	39.98	82.62	53.38	42.44
Toluene		318.25	149.66	145.77	222.69	111.06	98.55	204.36	111.59	96.86
Total Individual HC		868.3	512.1	439.4	948.9	549.8	480.7	991.2	602.0	513.6
Total as % of THC,	%	53.9	53.3	43.5	49.7	53.9	52.8	49.8	55.2	52.9
<u>Organic Sulfides</u>										
Carbonyl Sulfide		0.07	0.01	0.00	0.02	0.00	0.00	0.01	0.00	0.00
Methyl Sulfide		0.02	0.01	0.00	0.01	0.00	0.00	0.01	0.00	0.00
Ethyl Sulfide		0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00
Methyl Disulfide		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<u>Organic Amines</u>										
Monomethylamine		0.04	0.05	0.07	0.06	0.07	0.01	0.04	0.01	0.01
Monoethylamine		0.00	0.02	0.01	0.02	0.00	0.00	0.21	0.05	0.09
Trimethylamine		0.00	0.04	0.00	0.00	0.00	0.00	0.03	0.00	0.00
Diethylamine		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Triethylamine		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

TABLE B-1. CAR 711 - RICH BEST IDLE (Cont'd.)

1970 OLDSMOBILE DELTA 88

		EMISSION RATE, MG/KM (Except as Noted)								
		UNMODIFIED			WITH MALFUNCTION CONDITION					
		FTP	SET	HFET	FTP	SET	HFET	FTP	SET	HFET
Test Number, PVM-ST		711-11	711-12	711-13	711-21	711-22	711-23	711-31	711-32	711-33
<u>Other Elements</u>										
Chromium	Cr									
Lead	Pb	17.27	19.70	16.87	16.42	18.40	16.49	17.81	16.25	16.17
Manganese	Mn									
Arsenic	As									
Mercury	Hg									
Bromine	Br	10.21	14.98	12.96	9.67	14.46	12.69	10.07	13.12	12.91
Phosphorus	P	0.08	0.07	0.06	0.06	0.06	0.06	0.06	0.06	0.07
Silicon	Si				0.03					
Cadmium	Cd	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.02
Aluminum	Al	0.03	0.11	0.06	0.02	0.06	0.03	0.01	0.04	0.05
Sulfur	S	0.11	0.05	0.03		0.03	0.02	0.07	0.02	0.02
Sodium	Na	0.05	0.08	0.06	0.03	0.06	0.05	0.05	0.06	0.06
Fluorine	F									
Magnesium	Mg	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Potassium	K									
Chlorine	Cl	6.06	4.82	4.25	6.28	4.72	4.54	6.59	4.04	4.03
Platinum	Pt									
Zinc	Zn		0.03					0.02		
Copper	Cu	0.02	0.03					0.02		
Nickel	Ni									
Iron	Fe	0.52	0.31	0.07	0.26	0.20	0.03	0.17	0.05	
Vanadium	V							0.01	0.01	
Titanium	Ti									
Barium	Ba									
Calcium	Ca	0.05	0.01		0.08	0.02	0.01	0.01	0.01	

TABLE B-2. CAR 712 - 12 PERCENT MISFIRE
1970 OLDSMOBILE DELTA 88

		EMISSION RATE, MG/KM (Except as Noted)								
		UNMODIFIED			WITH MALFUNCTION CONDITION					
		FTP	SET	HFET	FTP	SET	HFET	FTP	SET	HFET
Test Number,	PVM-ST	712-11	712-12	712-13	712-21	712-22	712-23	712-41	712-42	712-43
Barometer,	mm hg	753.6	753.4	753.1	749.8	751.3	750.3	757.4	757.2	756.9
Humidity,	g/kg	4.8	4.5	4.2	4.8	5.2	5.0	4.3	3.6	3.8
Temperature,	°C	23.3	23.9	26.1	26.1	26.7	25.6	24.4	26.1	25.6
Total Fuel Sulfur,	mg/km	33.70	23.00	20.27	34.84	24.39	21.90	34.92	24.32	21.77
Avg. Exh. Oxygen,	%	1.65	1.73	1.28	4.57	4.46	3.82	4.02	3.90	3.48
Carbon Dioxide,	g/km	456.2	320.8	281.9	427.0	309.0	277.9	430.8	308.7	276.5
Fuel Cons.,	ℓ/100 km	20.70	14.13	12.45	21.40	14.98	13.45	21.45	14.94	13.37
<u>Regulated Emissions</u>										
Hydrocarbons (THC),	g/km	1.25	0.86	0.89	15.36	10.60	9.60	15.08	10.33	9.32
Carbon Monoxide,	g/km	15.71	4.83	4.41	16.36	5.28	4.27	15.23	5.39	4.51
Oxides of Nitrogen,	g/km	2.20	2.95	3.09	2.64	3.62	3.71	2.85	3.53	3.91
<u>Particulates</u>										
Total Particulates		89.70	64.98	64.78	132.59	66.37	69.78	115.13	74.03	75.65
Sulfate		0.87	0.37	0.46	0.26	0.31	0.31	0.76	0.83	0.60
Sulfate as % of TFS,	%	0.86	0.53	0.76	0.25	0.42	0.47	0.73	1.14	0.92
<u>Compound Group Totals</u>										
Aldehydes & Ketones		31.2	33.0	29.3	248.3	210.8	143.3	260.6	121.8	135.6
Individual Hydrocarbons		529.3	375.2	303.9	3076.6	2351.5	1970.3	3210.6	2491.3	2093.8
Organic Sulfides		0.07	0.03	0.04	0.05	0.00	0.01	0.03	0.00	0.00
Organic Amines		0.11	0.09	0.11	0.37	0.39	0.07	0.43	0.30	0.22
<u>Other Compounds</u>										
Ammonia		4.91	2.88	7.84	1.81	1.61	2.52	1.95	1.92	2.54
Cyanide & Cyanogen		3.53	2.18	6.92	1.22	0.28	0.87	1.12	0.25	0.80
Hydrogen Sulfide		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tetramethyllead		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ethylene Dichloride		--	--	--	0.00	0.00	0.00	0.00	0.00	0.00
Tetraethyllead		--	--	--	--	--	--	--	--	--
Ethylene Dibromide		0.00	0.00	0.00	4.48	2.15	3.50	2.88	2.84	1.47

TABLE B-2. CAR 712 - 12 PERCENT MISFIRE (Cont'd)
1970 OLDSMOBILE DELTA 88

		EMISSION RATE, MG/KM (Except as Noted)								
		UNMODIFIED			WITH MALFUNCTION CONDITION					
		FTP	SET	HFET	FTP	SET	HFET	FTP	SET	HFET
Test Number,	PVM-ST	712-11	712-12	712-13	712-21	712-22	712-23	712-41	712-42	712-43
<u>Aldehydes and Ketones</u>										
* Formaldehyde		27.18	25.85	24.46	200.92	166.50	120.50	211.55	104.33	124.44
Acetaldehyde		3.20	6.45	4.53	30.07	26.04	16.78	36.91	14.51	9.95
Acetone		0.78	0.69	0.30	11.03	11.37	4.96	5.92	1.04	0.49
Isobutyraldehyde		--	--	--	--	--	--	--	--	--
Methyl Ethyl Ketone		0.00	0.00	0.00	5.01	3.81	1.06	2.41	0.59	0.71
Hexanaldehyde		0.00	0.00	0.00	1.30	3.07	0.00	3.78	1.34	0.00
Aldehydes and Ketones		31.2	33.0	29.3	248.3	210.8	143.3	260.6	121.8	135.6
Total as % of THC,	%	2.5	3.8	3.3	1.6	2.0	1.5	1.7	1.2	1.5
<u>Individual Hydrocarbons</u>										
Methane		59.12	29.83	26.18	97.09	49.85	46.33	100.48	56.02	53.23
Ethylene		148.67	120.10	93.35	335.90	291.11	266.43	374.34	327.51	306.96
Ethane		12.34	9.99	8.65	29.41	23.66	22.92	33.63	26.40	25.70
Acetylene		75.18	48.90	42.06	110.62	64.10	65.68	116.95	74.30	78.20
Propane		0.63	1.09	0.57	2.95	1.81	1.74	2.77	1.93	1.77
Propylene		62.79	49.85	39.27	225.76	207.06	188.00	243.45	220.80	206.08
Benzene		43.70	32.59	25.91	212.10	210.33	93.22	183.54	138.92	117.34
Toluene		126.82	82.81	67.93	2062.78	1503.57	1285.99	2155.45	1645.46	1304.47
Total Individual HC		529.3	375.2	303.9	3076.6	2351.5	1970.3	3210.6	2491.3	2093.8
Total as % of THC,	%	42.3	43.6	34.1	20.0	22.2	20.5	21.3	24.1	22.5
<u>Organic Sulfides</u>										
Carbonyl Sulfide		0.02	0.01	0.01	0.03	0.00	0.01	0.01	0.00	0.00
Methyl Sulfide		0.04	0.02	0.03	0.02	0.00	0.00	0.02	0.00	0.00
Ethyl Sulfide		0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Methyl Disulfide		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<u>Organic Amines</u>										
Monomethylamine		0.11	0.08	0.11	0.37	0.39	0.07	0.36	0.30	0.21
Monoethylamine		0.00	0.01	0.00	0.00	0.00	0.00	0.07	0.00	0.01
Trimethylamine		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Diethylamine		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Triethylamine		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

		EMISSION RATE, MG/KM (Except as Noted)								
		UNMODIFIED			WITH MALFUNCTION CONDITION					
		FTP	SET	HFET	FTP	SET	HFET	FTP	SET	HFET
Test Number, PVM-ST		712-11	712-12	712-13	712-21	712-22	712-23	712-41	712-42	712-43
Other Elements										
Chromium	Cr									
Lead	Pb	22.06	19.01	12.31	29.81	20.14	18.22	36.38	29.89	24.16
Manganese	Mn									
Arsenic	As									
Mercury	Hg									
Bromine	Br	15.14	19.84	13.11	12.98	11.03	9.51	18.29	18.53	14.57
Phosphorus	P	0.10	0.08	0.06	0.10	0.09	0.07	0.11	0.11	0.11
Silicon	Si	0.02			0.04					
Cadmium	Cd		0.02		0.01	0.01	0.01	0.02	0.02	0.02
Aluminum	Al	0.10	0.17	0.03	0.14	0.03	0.01	0.10	0.12	0.02
Sulfur	S	0.25	0.08	0.03	0.59	0.32	0.25	0.55	0.34	0.25
Sodium	Na	0.07	0.08	0.05	0.08	0.05	0.05	0.09	0.08	0.06
Fluorine	F									
Magnesium	Mg	0.02	0.02	0.01	0.03	0.01	0.01	0.03	0.02	0.02
Potassium	K									
Chlorine	Cl	9.10	7.19	5.10	5.21	3.69	3.73	6.25	4.80	4.04
Platinum	Pt									
Zinc	Zn	0.05	0.03		0.06			0.03		
Copper	Cu		0.03			0.02		0.02	0.02	
Nickel	Ni				0.02					
Iron	Fe	3.88	0.85	0.16	5.79	0.89	0.17	3.22	0.88	0.26
Vanadium	V	0.01					0.01			
Titanium	Ti									
Barium	Ba									
Calcium	Ca	0.05	0.04		0.06	0.03	0.05	0.05	0.03	0.02

TABLE B-3 . CAR 712 - 12 PERCENT MISFIRE PLUS UNKNOWN MALFUNCTION
1970 OLDSMOBILE DELTA 88

EMISSION RATE, MG/KM (Except as Noted)

		UNMODIFIED			WITH MALFUNCTION CONDITION					
		FTP	SET	HFET	FTP	SET	HFET	FTP	SET	HFET
Test Number,	PVM-ST				712-31	712-32	712-33			
Barometer,	mm hg				748.5	748.5	747.8			
Humidity,	g/kg				5.3	5.7	5.8			
Temperature,	°C				25.0	25.6	26.7			
Total Fuel Sulfur,	mg/km				38.45	27.58	24.49			
Avg. Exh. Oxygen,	%				6.98	6.84	6.03			
Carbon Dioxide,	g/km				414.3	306.6	273.1			
Fuel Cons.,	ℓ/100 km				23.62	16.94	15.04			
<u>Regulated Emissions</u>										
Hydrocarbons (THC),	g/km				34.52	24.89	22.49			
Carbon Monoxide,	g/km				18.83	7.12	5.00			
Oxides of Nitrogen,	g/km				2.97	3.54	4.06			
<u>Particulates</u>										
Total Particulates					110.77	70.20	64.64			
Sulfate					0.97	1.06	0.99			
Sulfate as % of TFS,	%				0.84	1.28	1.35			
<u>Compound Group Totals</u>										
Aldehydes & Ketones					295.6	315.5	258.4			
Individual Hydrocarbons					7292.3	5643.2	5156.4			
Organic Sulfides					0.04	0.01	0.01			
Organic Amines					0.34	0.17	0.15			
<u>Other Compounds</u>										
Ammonia					4.78	3.90	9.05			
Cyanide & Cyanogen					1.53	0.44	1.60			
Hydrogen Sulfide					0.23	0.00	0.00			
Tetramethyllead					0.00	0.00	0.00			
Ethylene Dichloride					0.00	0.00	0.00			
Tetraethyllead					--	--	--			
Ethylene Dibromide					10.45	5.76	5.84			

TABLE B-3 . CAR 712 - 12 PERCENT MISFIRE PLUS UNKNOWN MALFUNCTION (Cont'd).
1970 OLDSMOBILE DELTA 88

		EMISSION RATE, MG/KM (Except as Noted)					
		UNMODIFIED			WITH MALFUNCTION CONDITION		
		FTP	SET	HFET	FTP	SET	HFET
Test Number,	PVM-ST				712-31	712-32	712-33
<u>Aldehydes and Ketones</u>							
Formaldehyde					205.25	235.95	210.25
Acetaldehyde					17.88	43.05	29.31
Acetone					4.69	20.54	9.88
Isobutyraldehyde					--	--	--
Methyl Ethyl Ketone					2.29	8.56	4.71
Hexanaldehyde					65.49	7.41	4.20
Aldehydes and Ketones					295.6	315.5	258.4
Total as % of THC, %					0.9	1.3	1.1
<u>Individual Hydrocarbons</u>							
Methane					121.41	66.92	57.26
Ethylene					440.46	415.96	367.72
Ethane					40.90	35.73	31.72
Acetylene					124.22	72.04	69.66
Propane					3.88	2.50	2.09
Propylene					305.06	308.83	273.59
Benzene					371.95	422.98	270.07
Toluene					5884.43	4318.26	4084.26
Total Individual HC					7292.3	5643.2	5156.4
Total as % of THC, %					21.1	22.7	22.9
<u>Organic Sulfides</u>							
Carbonyl Sulfide					0.01	0.01	0.01
Methyl Sulfide					0.03	0.00	0.00
Ethyl Sulfide					0.00	0.00	0.00
Methyl Disulfide					0.00	0.00	0.00
<u>Organic Amines</u>							
Monomethylamine					0.34	0.17	0.15
Monoethylamine					0.00	0.00	0.00
Trimethylamine					0.00	0.00	0.00
Diethylamine					0.00	0.00	0.00
Triethylamine					0.00	0.00	0.00

TABLE B-3 . 12 PERCENT MISFIRE PLUS UNKNOWN MALFUNCTION (Cont'd).
1970 OLDSMOBILE DELTA 88

		EMISSION RATE, MG/KM (Except as Noted)								
		UNMODIFIED			WITH MALFUNCTION CONDITION					
		FTP	SET	HFET	FTP	SET	HFET	FTP	SET	HFET
Test Number, PVM-ST		-	-	-	712-31	712-32	712-33	-	-	-
<u>Other Elements</u>										
Chromium	Cr				48.55	28.52	24.25			
Lead	Pb									
Manganese	Mn									
Arsenic	As									
Mercury	Hg									
Bromine	Br				18.49	11.60	9.60			
Phosphorus	P				0.12	0.09	0.07			
Silicon	Si				0.03					
Cadmium	Cd				0.03	0.02	0.01			
Aluminum	Al				0.14	0.06				
Sulfur	S				0.97	0.60	0.39			
Sodium	Na				0.13	0.06	0.05			
Fluorine	F									
Magnesium	Mg				0.03	0.02	0.01			
Potassium	K									
Chlorine	Cl				7.63	4.67	4.52			
Platinum	Pt									
Zinc	Zn				0.07	0.04				
Copper	Cu				0.03					
Nickel	Ni									
Iron	Fe				9.88	5.68	0.86			
Vanadium	V									
Titanium	Ti									
Barium	Ba									
Calcium	Ca				0.05	0.03				

TABLE B-4. CAR 721 - RICH BEST IDLE
1970 DODGE CHALLENGER

		EMISSION RATE, MG/KM (Except as Noted)								
		UNMODIFIED			WITH MALFUNCTION CONDITION					
		FTP	SET	HFET	FTP	SET	HFET	FTP	SET	HFET
Test Number,	PVM-ST	721-11	721-12	721-13	721-21	721-22	721-23	721-31	721-32	721-33
Barometer,	mm hg	744.2	744.2	744.0	753.6	752.3	751.6	743.7	743.0	741.9
Humidity,	g/kg	9.7	8.8	9.9	3.5	4.1	3.9	10.1	9.4	8.3
Temperature,	°C	23.9	24.4	25.0	27.8	25.0	25.6	26.1	26.1	25.6
Total Fuel Sulfur,	mg/km	20.27	15.08	14.00	20.95	15.65	14.13	20.95	15.65	14.41
Avg. Exh. Oxygen,	%	--	1.21	1.44	--	1.13	1.48	1.44	0.94	1.29
Carbon Dioxide,	g/km	255.7	205.2	193.8	239.8	203.2	195.1	234.8	201.5	197.5
Fuel Cons.,	ℓ/100 km	12.45	9.26	8.60	12.87	9.61	8.68	12.87	9.61	8.85
<u>Regulated Emissions</u>										
Hydrocarbons (THC),	g/km	1.71	0.85	0.67	2.29	1.25	0.74	2.39	1.23	0.76
Carbon Monoxide,	g/km	19.38	5.79	3.47	34.60	11.54	3.84	37.68	12.64	4.70
Oxides of Nitrogen,	g/km	1.83	2.56	2.79	1.83	2.54	2.64	1.79	2.66	2.88
<u>Particulates</u>										
Total Particulates		68.39	48.43	51.56	--	--	38.41	93.71	50.34	52.31
Sulfate		0.61	0.18	0.17	1.30	0.20	0.36	0.81	0.85	0.79
Sulfate as % of TFS,	%	1.00	0.40	0.40	2.07	0.43	0.85	1.29	1.81	1.83
<u>Compound Group Totals</u>										
Aldehydes & Ketones		7.3	8.9	7.1	11.5	13.6	10.5	10.7	19.1	9.4
Individual Hydrocarbons		764.2	378.0	222.1	1066.5	576.3	331.2	1090.5	563.8	352.1
Organic Sulfides		0.00	0.00	0.00	--	0.01	0.00	0.00	0.00	0.00
Organic Amines		0.01	0.02	0.02	0.13	0.09	0.01	0.00	0.00	0.00
<u>Other Compounds</u>										
Ammonia		1.30	1.08	1.36	4.22	8.84	2.21	4.53	2.12	3.58
Cyanide & Cyanogen		4.21	2.34	5.87	--	--	--	9.92	5.33	8.63
Hydrogen Sulfide		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tetramethyllead		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ethylene Dichloride		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tetraethyllead		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ethylene Dibromide		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

TABLE B-4. CAR 721 - RICH BEST IDLE (Cont'd),
1970 DODGE CHALLENGER

		EMISSION RATE, MG/KM (Except as Noted)								
		UNMODIFIED			WITH MALFUNCTION CONDITION					
		FTP	SET	HFET	FTP	SET	HFET	FTP	SET	HFET
Test Number,	PVM-ST	721-11	721-12	721-13	721-21	721-22	721-23	721-31	721-32	721-33
<u>Aldehydes and Ketones</u>										
Formaldehyde		7.27	8.67	6.26	10.38	12.02	10.07	8.33	14.98	9.40
Acetaldehyde		0.00	0.26	0.81	0.97	1.54	0.46	2.06	4.16	0.00
Acetone		0.00	0.00	0.00	0.12	0.00	0.00	0.26	0.00	0.00
Isobutyraldehyde		--	--	--	--	--	--	--	--	--
Methyl Ethyl Ketone		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hexanaldehyde		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Aldehydes and Ketones		7.3	8.9	7.1	11.5	13.6	10.5	10.7	19.1	9.4
Total as % of THC,	%	0.4	1.0	1.1	0.5	1.1	1.4	0.4	1.6	1.2
<u>Individual Hydrocarbons</u>										
Methane		100.80	35.28	18.08	184.51	78.47	31.91	202.10	83.07	37.48
Ethylene		169.08	103.98	64.74	248.32	147.33	96.62	249.67	151.83	105.29
Ethane		13.66	9.69	5.64	22.47	13.88	8.69	23.37	15.43	10.41
Acetylene		181.27	77.84	40.07	178.62	94.34	51.46	198.86	98.20	57.87
Propane		0.30	0.15	0.17	2.21	1.08	0.83	2.33	1.36	0.81
Propylene		68.90	42.01	27.36	94.40	57.05	40.21	94.26	58.49	42.98
Benzene		51.70	26.97	17.12	84.82	54.71	27.00	81.79	39.45	25.86
Toluene		178.36	82.04	48.90	251.15	129.44	74.44	238.14	115.92	71.39
Total Individual HC		764.2	378.0	222.1	1066.5	576.3	331.2	1090.5	563.8	352.1
Total as % of THC,	%	44.7	44.5	33.1	46.6	46.1	44.8	45.6	45.8	46.3
<u>Organic Sulfides</u>										
Carbonyl Sulfide		0.00	0.00	0.00	--	0.01	0.00	0.00	0.00	0.00
Methyl Sulfide		0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00
Ethyl Sulfide		0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00
Methyl Disulfide		0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00
<u>Organic Amines</u>										
Monomethylamine		0.01	0.02	0.01	0.02	0.02	0.01	0.00	0.00	0.00
Monoethylamine		0.00	0.00	0.01	0.10	0.07	0.00	0.00	0.00	0.00
Trimethylamine		0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00
Diethylamine		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Triethylamine		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

1970 DODGE CHALLENGER

		EMISSION RATE, MG/KM (Except as Noted)								
		UNMODIFIED			WITH MALFUNCTION CONDITION					
		FTP	SET	HFET	FTP	SET	HFET	FTP	SET	HFET
Test Number, PVM-ST		721-11	721-12	721-13	721-21	721-22	721-23	721-31	721-32	721-33
Other Elements										
Chromium	Cr					0.03				
Lead	Pb	12.97	11.09	9.53	10.26	8.30	11.16	10.41	10.72	10.26
Manganese	Mn					0.02				
Arsenic	As									
Mercury	Hg									
Bromine	Br	5.80	6.76	6.58	4.38	5.27	8.21	4.62	6.55	7.97
Phosphorus	P	0.11	0.08	0.07	0.10	0.05	0.06	0.10	0.07	0.06
Silicon	Si									
Cadmium	Cd	0.01	0.01	0.01		0.01			0.01	0.01
Aluminum	Al		0.01						0.01	
Sulfur	S	0.09	0.03	0.03	0.13	0.03	0.04	0.13	0.04	0.04
Sodium	Na	0.06	0.03	0.03	0.02	0.03	0.02	0.02	0.03	0.04
Fluorine	F									
Magnesium	Mg	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Potassium	K									
Chlorine	Cl	4.13	5.14	5.75	2.16	5.52	7.84	2.44	6.03	7.98
Platinum	Pt									
Zinc	Zn	0.11	0.05	0.03	0.77	0.05	0.05	0.11	0.05	0.03
Copper	Cu									
Nickel	Ni									
Iron	Fe	0.58	0.36	0.10	0.99	0.39	0.30	0.47	0.48	0.25
Vanadium	V				0.01		0.01			
Titanium	Ti					0.00				
Barium	Ba									
Calcium	Ca	0.05	0.02	0.01	0.09	0.02	0.02	0.08	0.03	0.01

TABLE B-5. CAR 722 - 12 PERCENT IGNITION MISFIRE
1970 DODGE CHALLENGER

		EMISSION RATE, MG/KM (Except as Noted)								
		UNMODIFIED			WITH MALFUNCTION CONDITION					
		FTP	SET	HFET	FTP	SET	HFET	FTP	SET	HFET
Test Number,	PVM-ST	722-11	722-12	722-13	722-21	722-22	722-23	722-31	722-32	722-33
Barometer,	mm hg	743.5	743.5	743.5	738.1	736.3	736.3	746.3	746.8	746.5
Humidity,	g/kg	11.1	10.4	9.4	11.7	12.2	10.7	8.7	8.1	8.5
Temperature,	°C	25.6	25.6	26.1	24.4	26.7	25.0	24.4	24.4	25.0
Total Fuel Sulfur, mg/km		20.66	15.03	13.71	21.88	16.22	15.63	21.12	16.38	15.17
Avg. Exh. Oxygen, %		1.25	1.45	1.63	4.10	3.83	3.76	3.81	--	--
Carbon Dioxide, g/km		258.7	202.6	189.2	245.9	197.6	196.0	242.0	201.3	191.4
Fuel Cons., l/100 km		12.69	9.23	8.42	13.44	9.96	9.60	12.97	10.06	9.32
<u>Regulated Emissions</u>										
Hydrocarbons (THC), g/km		1.82	0.89	0.73	9.86	7.25	6.81	9.42	7.18	6.67
Carbon Monoxide, g/km		20.96	6.90	3.58	23.98	8.16	4.67	20.27	7.32	3.67
Oxides of Nitrogen, g/km		2.02	2.41	2.63	2.04	2.61	3.02	2.10	2.75	3.17
<u>Particulates</u>										
Total Particulates		102.6	62.13	50.33	101.59	79.14	37.77	71.12	68.62	66.00
Sulfate		0.17	0.14	0.08	0.19	0.22	0.33	0.17	0.48	0.45
Sulfate as % of TFS, %		0.27	0.31	0.19	0.29	0.45	0.70	0.27	0.98	0.99
<u>Compound Group Totals</u>										
Aldehydes & Ketones		--	7.8	8.5	47.9	--	85.1	55.5	72.8	102.6
Individual Hydrocarbons		734.5	368.6	--	1992.0	1275.3	1255.0	1901.2	1443.2	1256.4
Organic Sulfides		0.01	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00
Organic Amines		0.01	0.01	0.00	0.00	0.01	0.04	0.02	0.01	0.00
<u>Other Compounds</u>										
Ammonia		5.20	1.20	2.02	5.48	2.92	2.96	2.02	1.30	0.51
Cyanide & Cyanogen		4.76	3.10	5.95	2.37	0.30	0.81	3.14	0.52	1.64
Hydrogen Sulfide		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tetramethyllead		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ethylene Dichloride		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tetraethyllead		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ethylene Dibromide		0.00	0.00	0.00	2.16	1.28	1.19	1.96	2.27	2.35

TABLE B-5. CAR 722 - 12 PERCENT IGNITION MISFIRE (Cont'd).
1970 DODGE CHALLENGER

		EMISSION RATE, MG/KM (Except as Noted)								
		UNMODIFIED			WITH MALFUNCTION CONDITION					
		FTP	SET	HFET	FTP	SET	HFET	FTP	SET	HFET
Test Number,	PVM-ST	722-11	722-12	722-13	722-21	722-22	722-23	722-31	722-32	722-33
<u>Aldehydes and Ketones</u>										
Formaldehyde		--	7.31	7.92	43.56	--	70.85	50.24	64.51	88.56
Acetaldehyde		--	0.47	0.56	3.71	--	9.43	5.30	7.95	13.32
Acetone		--	0.00	0.00	0.61	--	3.25	0.00	0.00	0.00
Isobutyraldehyde		--	--	--	--	--	--	--	--	--
Methyl Ethyl Ketone		--	0.00	0.00	0.00	--	0.00	0.00	0.00	0.00
Hexanaldehyde		--	0.00	0.00	0.00	--	1.52	0.00	0.30	0.75
Aldehydes and Ketones		--	7.8	8.5	47.9	--	85.1	55.5	72.8	102.6
Total as % of THC,	%	--	0.9	1.2	0.5	--	1.2	0.6	1.0	1.5
<u>Individual Hydrocarbons</u>										
Methane		106.29	42.37	--	131.16	56.10	39.10	99.06	49.13	32.62
Ethylene		174.03	106.68	--	216.49	181.90	177.49	169.30	164.69	156.81
Ethane		16.88	10.22	--	20.38	16.35	14.86	18.53	15.36	13.48
Acetylene		116.33	55.17	--	129.26	60.50	48.97	146.33	80.56	65.06
Propane		4.01	1.48	--	2.61	1.62	1.33	2.38	1.62	1.17
Propylene		73.66	44.68	--	111.25	114.22	123.95	105.54	113.99	114.07
Benzene		59.26	29.95	--	115.35	62.99	73.51	129.01	75.42	68.14
Toluene		184.05	78.04	--	1265.53	781.64	775.78	1231.03	942.38	805.04
Total Individual HC		734.5	368.6	--	1992.0	1275.3	1255.0	1901.2	1443.2	1256.4
Total as % of THC,	%	40.4	41.4	--	20.2	17.6	18.4	20.2	20.1	18.8
<u>Organic Sulfides</u>										
Carbonyl Sulfide		0.01	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00
Methyl Sulfide		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ethyl Sulfide		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Methyl Disulfide		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<u>Organic Amines</u>										
Monomethylamine		0.01	0.00	0.00	0.00	0.01	0.02	0.01	0.01	0.00
Monoethylamine		0.00	0.01	0.00	0.00	0.00	0.02	0.01	0.00	0.00
Trimethylamine		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Diethylamine		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Triethylamine		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

TABLE B-5. CAR 722 - 12 PERCENT IGNITION MISFIRE (Cont'd).
1970 DODGE CHALLENGER

		EMISSION RATE, MG/KM (Except as Noted)								
		UNMODIFIED			WITH MALFUNCTION CONDITION					
		FTP	SET	HFET	FTP	SET	HFET	FTP	SET	HFET
Test Number, PVM-ST	Other Elements	722-11	722-12	722-13	722-21	722-22	722-23	722-31	722-32	722-33
Chromium	Cr									
Lead	Pb	17.46	14.55	10.09	18.41	14.72	11.32	12.94	9.87	9.13
Manganese	Mn				0.03					
Arsenic	As									
Mercury	Hg									
Bromine	Br	7.21	8.65	6.78	7.26	6.67	5.72	5.21	4.66	4.68
Phosphorus	P	0.14	0.08	0.06	0.10	0.07	0.06	0.06	0.05	0.05
Silicon	Si									
Cadmium	Cd		0.01	0.01	0.01		0.01		0.01	0.01
Aluminum	Al	0.09	0.04	0.01	0.06	0.03				
Sulfur	S	0.40	0.11	0.06	0.32	0.29	0.15	0.15	0.13	0.12
Sodium	Na	0.07	0.06	0.04	0.07	0.04	0.04	0.05	0.03	0.03
Fluorine	F									
Magnesium	Mg	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Potassium	K									
Chlorine	Cl	5.60	7.16	7.65	4.54	4.20	3.18	3.22	2.72	2.62
Platinum	Pt									
Zinc	Zn	0.28	0.10	0.06	0.28	0.21	0.09	0.15	0.07	0.06
Copper	Cu									
Nickel	Ni									
Iron	Fe	12.67	2.99	1.26	5.30	5.02	1.08	1.22	0.65	0.33
Vanadium	V								0.01	
Titanium	Ti									
Barium	Ba									
Calcium	Ca	0.12	0.03	0.02	0.07	0.04		0.03	0.02	0.01
Cobalt	Co	0.02								

TABLE B-6. CAR 723- LEAN IDLE
1970 DODGE CHALLENGER

EMISSION RATE, MG/KM (Except as Noted)

		UNMODIFIED			WITH MALFUNCTION CONDITION					
		FTP	SET	HFET	FTP	SET	HFET	FTP	SET	HFET
Test Number,	PVM-ST	723-11	723-12	723-13	723-21	723-22	723-23	723-31	723-32	723-33
Barometer,	mm hg	748.3	748.3	748.0	745.5	744.5	744.0	739.4	738.4	737.6
Humidity,	g/kg	10.0	8.6	7.7	8.2	8.3	7.6	10.0	10.0	9.5
Temperature,	°C	26.1	26.1	26.7	27.2	25.6	25.6	26.7	26.7	26.1
Total Fuel Sulfur, mg/km		20.02	15.22	13.99	20.33	15.43	14.12	20.59	15.37	13.97
Avg. Exh. Oxygen, %		1.25	1.49	1.78	6.25	5.01	3.27	6.00	5.63	3.56
Carbon Dioxide, g/km		255.3	209.0	194.7	257.5	209.0	193.5	259.6	207.6	190.7
Fuel Cons., l/100 km		12.30	9.35	8.59	12.49	9.48	8.67	12.65	9.44	8.58
<u>Regulated Emissions</u>										
Hydrocarbons (THC), g/km		1.60	0.86	0.63	3.36	1.50	0.90	3.28	1.48	0.97
Carbon Monoxide, g/km		17.60	4.68	2.95	15.59	5.34	4.30	16.77	5.62	4.61
Oxides of Nitrogen, g/km		1.87	2.68	2.80	1.77	2.37	2.54	1.82	2.60	2.69
<u>Particulates</u>										
Total Particulates		73.24	42.68	46.03	76.92	40.99	56.82	81.76	52.52	84.02
Sulfate		0.64	0.53	0.50	0.53	0.54	0.56	0.49	0.47	0.64
Sulfate as % of TFS, %		1.07	1.16	1.19	0.87	1.17	1.32	0.79	1.02	1.53
<u>Compound Group Totals</u>										
Aldehydes & Ketones		18.2	18.1	11.3	42.0	24.4	16.4	44.3	27.4	9.9
Individual Hydrocarbons		657.8	346.0	263.9	883.5	450.6	334.1	894.9	451.9	336.7
Organic Sulfides		--	0.09	0.01	0.03	0.01	0.01	0.04	0.00	0.02
Organic Amines		0.08	0.09	0.06	0.12	0.00	0.00	0.05	0.04	0.04
<u>Other Compounds</u>										
Ammonia		2.20	2.74	1.69	--	0.80	3.00	3.65	1.87	3.45
Cyanide & Cyanogen		6.64	3.55	9.09	4.79	3.90	8.34	5.00	2.75	8.64
Hydrogen Sulfide		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tetramethyllead		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ethylene Dichloride		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tetraethyllead		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ethylene Dibromide		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

TABLE B-6. CAR 723 - LEAN IDLE (Cont'd)
1970 DODGE CHALLENGER

		EMISSION RATE, MG/KM (Except as Noted)								
		UNMODIFIED			WITH MALFUNCTION CONDITION					
		FTP	SET	HFET	FTP	SET	HFET	FTP	SET	HFET
Test Number,	PVM-ST	723-11	723-12	723-13	723-21	723-22	723-23	723-31	723-32	723-33
<u>Aldehydes and Ketones</u>										
Formaldehyde		11.34	13.87	7.21	33.50	21.64	13.87	37.52	22.69	8.87
Acetaldehyde		6.89	4.11	3.78	8.46	2.78	2.50	6.66	4.66	0.99
Acetone		0.00	0.13	0.28	0.00	0.00	0.00	0.00	0.00	0.00
Isobutyraldehyde		--	--	--	--	--	--	--	--	--
Methyl Ethyl Ketone		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hexanaldehyde		0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.00	0.00
Aldehydes and Ketones		18.2	18.1	11.3	42.0	24.2	16.4	44.3	27.4	9.9
Total as % of THC, %		1.1	2.1	1.8	1.3	1.6	1.8	1.4	1.9	1.0
<u>Individual Hydrocarbons</u>										
Methane		89.08	31.79	20.94	68.83	30.78	26.43	76.41	31.42	27.60
Ethylene		153.89	99.07	80.53	196.20	116.78	92.80	190.05	114.39	91.54
Ethane		14.81	8.79	6.60	18.05	10.32	8.28	17.81	10.47	8.39
Acetylene		101.72	44.91	36.33	64.20	37.86	38.70	69.96	36.52	38.12
Propane		1.45	0.00	0.00	1.45	0.00	0.49	2.45	0.94	0.65
Propylene		66.43	42.39	34.43	100.98	56.92	42.06	94.58	54.55	40.98
Benzene		51.31	27.17	21.24	49.15	30.05	24.07	61.64	23.48	23.98
Toluene		179.10	91.83	63.83	384.60	167.91	101.26	381.97	180.14	105.46
Total Individual HC		657.8	346.0	263.9	883.5	450.6	334.1	894.9	451.9	336.7
Total as % of THC, %		41.1	40.2	41.9	26.3	30.0	37.1	27.3	30.5	34.7
<u>Organic Sulfides</u>										
Carbonyl Sulfide		--	0.09	0.01	0.03	0.01	0.00	0.02	0.00	0.02
Methyl Sulfide		--	0.00	0.00	0.00	0.00	0.01	0.02	0.00	0.00
Ethyl Sulfide		--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Methyl Disulfide		--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<u>Organic Amines</u>										
Monomethylamine		0.03	0.06	0.03	0.10	0.00	0.00	0.05	0.04	0.04
Monoethylamine		0.03	0.03	0.03	0.02	0.00	0.00	0.00	0.00	0.00
Trimethylamine		0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Diethylamine		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Triethylamine		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

TABLE B-6. CAR 723 - LEAN IDLE (Cont'd)
1970 DODGE CHALLENGER

		EMISSION RATE, MG/KM (Except as Noted)								
		UNMODIFIED			WITH MALFUNCTION CONDITION					
		FTP	SET	HFET	FTP	SET	HFET	FTP	SET	HFET
Test Number, PVM-ST		723-11	723-12	723-13	723-21	723-22	723-23	723-31	723-32	723-33
Other Elements										
Chromium	Cr									
Lead	Pb	14.58	8.74	7.99	13.11	11.58	9.18	15.48	11.13	24.56
Manganese	Mn									
Arsenic	As									
Mercury	Hg									
Bromine	Br	6.77	5.73	6.02	5.97	7.28	6.43	7.39	6.91	13.12
Phosphorus	P	0.11	0.06	0.05	0.08	0.07	0.06	0.07	0.07	0.09
Silicon	Si									
Cadmium	Cd	0.01						0.01	0.01	0.01
Aluminum	Al									
Sulfur	S	0.11	0.03	0.02	0.13	0.06	0.04	0.11	0.05	0.17
Sodium	Na	0.05	0.03	0.03	0.04	0.04	0.03	0.03	0.03	0.07
Fluorine	F									
Magnesium	Mg	0.01	0.01	0.01		0.01	0.01	0.01	0.01	0.01
Potassium	K									
Chlorine	Cl	3.60	4.82	5.91	2.77	4.71	5.24	3.14	3.87	5.92
Platinum	Pt									
Zinc	Zn	0.11	0.05		0.05	0.05	0.03	0.09	0.05	0.08
Copper	Cu	0.03								
Nickel	Ni									
Iron	Fe	1.00	0.30	0.12	0.39	0.24	0.09	0.35	0.22	1.29
Vanadium	V	0.01								
Titanium	Ti									
Barium	Ba									
Calcium	Ca	0.05	0.02		0.04	0.02	0.01	0.04	0.02	0.03

TABLE B-7 . CAR 731 - RICH BEST IDLE
1970 CHEVROLET MONTE CARLO

		EMISSION RATE, MG/KM (Except as Noted)								
		UNMODIFIED			WITH MALFUNCTION CONDITION					
		FTP	SET	HFET	FTP	SET	HFET	FTP	SET	HFET
Test Number,	PVM-ST	731-11	731-12	731-13	731-31	731-32	731-33	731-41	731-42	731-43
Barometer,	mm hg	750.3	749.3	748.5	744.7	744.5	744.0	741.4	740.9	740.4
Humidity,	g/kg	4.9	5.5	6.3	6.4	6.0	6.0	9.0	8.3	8.8
Temperature,	°C	24.4	28.9	30.0	23.9	25.0	27.8	25.6	25.6	26.1
Total Fuel Sulfur, mg/km		29.26	20.30	18.10	29.48	20.32	18.14	29.71	20.48	17.89
Avg. Exh. Oxygen, %		1.78	2.19	1.80	0.86	1.04	0.80	0.66	0.85	1.09
Carbon Dioxide, g/km		387.5	279.5	247.2	335.7	261.2	242.6	334.5	262.7	239.1
Fuel Cons., l/100 km		17.97	12.47	11.12	18.11	12.48	11.14	18.25	12.58	10.99
<u>Regulated Emissions</u>										
Hydrocarbons (THC), g/km		2.00	1.28	1.27	2.89	1.60	1.43	2.94	1.67	1.54
Carbon Monoxide, g/km		17.23	5.45	5.85	50.62	16.57	8.81	53.24	16.91	8.61
Oxides of Nitrogen, g/km		2.70	3.30	3.55	2.30	3.08	3.50	2.25	3.43	3.71
<u>Particulates</u>										
Total Particulates		115.78	71.25	85.64	108.32	59.41	99.16	113.97	73.53	87.70
Sulfate		1.75	0.35	0.68	1.05	0.37	0.61	0.22	0.40	0.24
Sulfate as % of TFS, %		1.99	0.57	1.25	1.19	0.61	1.12	0.25	0.65	0.45
<u>Compound Group Totals</u>										
Aldehydes & Ketones		89.4	--	--	61.1	36.6	29.7	42.6	31.4	49.2
Individual Hydrocarbons		769.9	539.2	577.2	1184.2	743.3	665.2	1181.0	763.4	688.6
Organic Sulfides		0.39	0.17	0.11	0.10	0.02	0.05	0.23	0.02	0.01
Organic Amines		0.06	0.11	0.07	0.04	0.06	0.06	0.31	0.27	0.49
<u>Other Compounds</u>										
Ammonia		6.98	2.41	1.89	2.95	8.83	4.07	2.42	2.02	2.19
Cyanide & Cyanogen		3.45	1.37	1.42	6.01	7.27	8.05	4.56	2.46	7.57
Hydrogen Sulfide		0.09	0.00	0.00	0.00	0.00	0.00	0.10	0.00	0.00
Tetramethyllead		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ethylene Dichloride		--	--	--	--	--	--	0.00	0.00	0.00
Tetraethyllead		--	--	--	--	--	--	--	--	--
Ethylene Dibromide		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

TABLE B-7 . CAR 731 - RICH BEST IDLE (Cont'd)
1970 CHEVROLET MONTE CARLO

		EMISSION RATE, MG/KM (Except as Noted)								
		UNMODIFIED			WITH MALFUNCTION CONDITION					
		FTP	SET	HFET	FTP	SET	HFET	FTP	SET	HFET
Test Number,	PVM-ST	731-11	731-12	731-13	731-31	731-32	731-33	731-41	731-42	731-43
<u>Aldehydes and Ketones</u>										
Formaldehyde		80.05	--	--	53.68	34.03	28.05	36.86	31.32	44.87
Acetaldehyde		9.38	--	--	6.84	2.07	1.18	5.08	0.12	4.33
Acetone		0.00	--	--	0.62	0.49	0.51	0.00	0.00	0.00
Isobutyraldehyde		--	--	--	--	--	--	--	--	--
Methyl Ethyl Ketone		0.00	--	--	0.00	0.00	0.00	0.64	0.00	0.00
Hexanaldehyde		0.00	--	--	0.00	0.00	0.00	0.00	0.00	0.00
Aldehydes and Ketones		89.4	--	--	61.1	36.6	29.7	42.6	31.4	49.2
Total as % of THC,	%	4.5	--	--	2.1	2.3	2.1	1.4	1.9	3.1
<u>Individual Hydrocarbons</u>										
Methane		74.78	41.95	50.62	178.61	82.83	63.99	195.58	92.79	71.21
Ethylene		221.40	175.32	185.23	284.03	217.41	207.14	280.60	222.53	206.56
Ethane		17.69	14.01	15.45	25.10	19.95	19.05	25.49	20.73	20.49
Acetylene		81.59	57.92	73.56	161.04	98.69	92.54	169.62	105.78	100.99
Propane		10.22	0.00	1.20	2.71	1.61	1.30	2.08	1.05	0.90
Propylene		104.45	81.33	84.31	120.87	90.55	90.18	119.18	94.24	91.70
Benzene		55.05	39.14	42.02	86.39	57.99	49.15	89.18	61.64	49.36
Toluene		204.68	129.53	124.77	325.40	174.26	141.81	299.26	164.68	147.35
Total Individual HC		769.9	539.2	577.2	1184.2	743.3	665.2	1181.0	763.4	688.6
Total as % of THC,	%	38.5	42.1	45.4	41.0	46.5	46.5	40.2	45.7	44.7
<u>Organic Sulfides</u>										
Carbonyl Sulfide		0.34	0.15	0.06	0.06	0.02	0.02	0.05	0.00	0.00
Methyl Sulfide		0.05	0.02	0.05	0.04	0.00	0.03	0.16	0.02	0.01
Ethyl Sulfide		0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00
Methyl Disulfide		0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00
<u>Organic Amines</u>										
Monomethylamine		0.06	0.11	0.04	0.04	0.05	0.06	0.31	0.27	0.30
Monoethylamine		0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.19
Trimethylamine		0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00
Diethylamine		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Triethylamine		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

TABLE B-7. CAR 73L - RICH BEST IDLE (Cont'd.)
1970 CHEVROLET MONTE CARLO

		EMISSION RATE, MG/KM (Except as Noted)								
		UNMODIFIED			WITH MALFUNCTION CONDITION					
		FTP	SET	HFET	FTP	SET	HFET	FTP	SET	HFET
Test Number, PVM-ST		73L-11	73L-12	73L-13	73L-21	73L-22	73L-23	73L-31	73L-32	73L-33
Other Elements										
Chromium	Cr									
Lead	Pb	22.26	16.99	12.57	18.93	13.95	11.47	14.18	13.38	9.25
Manganese	Mn									
Arsenic	As									
Mercury	Hg									
Bromine	Br	9.37	1.08	6.91	8.69	8.86	6.27	6.62	8.30	5.45
Phosphorus	P	0.17	0.20	0.21	0.09	0.13	0.17	0.06	0.11	0.12
Silicon	Si		0.03							
Cadmium	Cd		0.01			0.01	0.01		0.01	
Aluminum	Al	0.42	0.26	0.09	0.44	0.07		0.05	0.02	
Sulfur	S	0.62	0.21	0.15	0.55	0.07	0.07	0.29	0.06	0.05
Sodium	Na	0.02	0.07		0.02	0.04	0.03	0.02	0.04	0.03
Fluorine	F									
Magnesium	Mg	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01
Potassium	K									
Chlorine	Cl	2.48	3.33	1.99	2.63	3.09	2.32	2.28	2.86	1.82
Platinum	Pt									
Zinc	Zn	0.14	0.11	0.11		0.05	0.07		0.04	
Copper	Cu		0.02							
Nickel	Ni									
Iron	Fe	6.17	4.02	2.35	1.40	0.42	0.09	1.01	0.45	0.07
Vanadium	V			0.01			0.01			
Titanium	Ti									
Barium	Ba									
Calcium	Ca	0.08	0.07	0.07		0.03	0.03	0.04	0.05	0.02
Antimony	Sb			0.01						

TABLE B-8. CAR 732 - 12 PERCENT MISFIRE W/O VAC. ADVANCE
1970 CHEVROLET MONTE CARLO

		EMISSION RATE, MG/KM (Except as Noted)								
		W/O VAC. ADVANCE			WITH MALFUNCTION CONDITION					
		FTP	SET	HFET	FTP	SET	HFET	FTP	SET	HFET
Test Number,	PVM-ST	732-11	732-12	732-13	732-21	732-22	732-23	732-31	732-32	732-33
Barometer,	mm hg	744.5	744.0	743.7	741.7	740.9	740.7	740.2	739.9	739.6
Humidity,	g/kg	9.4	9.9	9.9	7.4	7.1	7.2	11.9	10.2	10.4
Temperature,	°C	26.1	26.7	26.7	26.1	23.9	26.7	25.6	26.1	27.2
Total Fuel Sulfur, mg/km		30.51	22.06	20.95	30.75	22.53	21.18	31.47	23.51	20.90
Avg. Exh. Oxygen, %		2.03	2.32	1.91	--	--	--	--	--	--
Carbon Dioxide, g/km		410.1	306.2	292.3	377.0	285.1	270.2	386.1	298.4	266.7
Fuel Cons., l/100 km		18.74	13.55	12.87	18.89	13.84	13.01	19.33	14.44	12.84
<u>Regulated Emissions</u>										
Hydrocarbons (THC), g/km		1.73	1.05	0.69	13.79	9.65	8.69	14.29	10.06	8.51
Carbon Monoxide, g/km		14.93	5.08	4.43	13.87	5.35	4.57	13.68	5.13	4.55
Oxides of Nitrogen, g/km		1.46	1.56	1.67	1.85	1.85	1.99	1.95	1.98	1.79
<u>Particulates</u>										
Total Particulates		112.24	86.07	79.36	208.04	112.50	108.05	236.54	176.71	128.54
Sulfate		0.64	0.45	0.21	2.51	1.27	1.03	2.49	1.71	1.18
Sulfate as % of TFS, %		0.70	0.68	0.33	2.72	1.88	1.62	2.64	2.42	1.88
<u>Compound Group Totals</u>										
Aldehydes & Ketones		36.4	24.0	22.1	229.3	126.4	218.1	227.2	200.0	181.3
Individual Hydrocarbons		666.7	381.1	308.9	2840.7	1992.8	1976.6	3153.0	2188.7	1838.6
Organic Sulfides		0.05	0.01	0.04	0.03	0.01	0.02	0.12	0.00	0.00
Organic Amines		0.08	0.03	0.04	0.18	0.06	0.09	0.11	0.07	0.00
<u>Other Compounds</u>										
Ammonia		4.36	1.94	3.00	5.62	1.57	5.13	3.80	4.04	2.57
Cyanide & Cyanogen		2.99	1.26	7.66	1.78	0.52	1.99	1.73	0.40	2.50
Hydrogen Sulfide		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tetramethyllead		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ethylene Dichloride		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tetraethyllead		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ethylene Dibromide		0.00	0.00	0.00	3.48	2.03	2.93	2.55	1.63	4.21

TABLE B-8 . CAR 732 - 12 PERCENT MISFIRE W/O VAC. ADVANCE (Cont'd.)
1970 CHEVROLET MONTE CARLO

		EMISSION RATE, MG/KM (Except as Noted)								
		W/O VAC. ADVANCE			WITH MALFUNCTION CONDITION					
		FTP	SET	HFET	FTP	SET	HFET	FTP	SET	HFET
Test Number,	PVM-ST	732-11	732-12	732-13	732-21	732-22	732-23	732-31	732-32	732-33
<u>Aldehydes and Ketones</u>										
Formaldehyde		30.74	21.48	9.17	181.54	103.31	183.03	174.39	169.75	163.31
Acetaldehyde		4.88	2.48	2.90	35.87	21.05	25.38	32.71	18.25	12.78
Acetone		0.81	0.08	0.00	8.05	0.00	8.16	14.04	8.71	3.65
Isobutyraldehyde		--	--	--	--	--	--	--	--	--
Methyl Ethyl Ketone		0.00	0.00	0.00	1.99	0.00	1.53	3.66	1.52	1.55
Hexanaldehyde		0.00	0.00	0.00	1.86	2.03	0.00	2.43	1.34	0.00
Aldehydes and Ketones		36.4	24.0	22.1	229.3	126.4	218.1	227.2	200.0	181.3
Total as % of THC,	%	2.1	2.3	3.2	1.7	1.3	2.5	1.6	2.0	2.1
<u>Individual Hydrocarbons</u>										
Methane		73.49	30.68	27.56	88.56	53.47	54.04	85.84	53.62	52.58
Ethylene		169.72	106.99	94.82	373.08	333.53	351.64	361.44	352.70	340.47
Ethane		13.74	7.88	6.82	30.81	25.64	26.05	29.33	26.46	26.25
Acetylene		82.67	41.78	41.12	93.72	64.49	70.56	94.65	66.05	67.66
Propane		0.68	0.83	0.00	3.76	2.48	2.17	1.44	1.32	1.57
Propylene		74.90	42.88	35.32	228.20	226.58	235.87	237.40	235.60	225.16
Benzene		48.76	29.80	26.64	139.59	94.46	100.43	261.50	110.54	108.26
Toluene		202.76	120.29	76.61	1882.99	1192.10	1135.84	2081.42	1342.37	1016.60
Total Individual HC		666.7	381.1	308.9	2840.7	1992.8	1976.6	3153.0	2188.7	1838.6
Total as % of THC,	%	38.5	36.3	44.8	20.6	20.7	22.7	22.1	21.8	21.6
<u>Organic Sulfides</u>										
Carbonyl Sulfide		0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00
Methyl Sulfide		0.03	0.01	0.03	0.02	0.00	0.01	0.11	0.00	0.00
Ethyl Sulfide		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Methyl Disulfide		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<u>Organic Amines</u>										
Monomethylamine		0.04	0.02	0.03	0.18	0.06	0.09	0.11	0.07	0.00
Monoethylamine		0.03	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Trimethylamine		0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Diethylamine		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Triethylamine		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

TABLE B-8. CAR 732 - 12 PERCENT MISFIRE W/O VACUUM ADVANCE (Cont'd.)
1970 CHEVROLET MONTE CARLO

		EMISSION RATE, MG/KM (Except as Noted)								
		W/O VAC. ADVANCE			WITH MALFUNCTION CONDITION					
		FTP	SET	HFET	FTP	SET	HFET	FTP	SET	HFET
Test Number, PVM-ST		732-11	732-12	732-13	732-21	732-22	732-23	732-31	732-32	732-33
Other Elements										
Chromium	Cr									
Lead	Pb	21.41	20.00	15.28	20.62	16.30	17.31	50.14	33.35	21.43
Manganese	Mn								0.06	
Arsenic	As									
Mercury	Hg									
Bromine	Br	13.40	24.42	22.61	8.86	8.39	9.44	17.62	13.19	10.20
Phosphorus	P	0.11	0.11	0.10	0.13	0.10	0.12	0.32	0.21	0.13
Silicon	Si	0.03	0.03						0.12	
Cadmium	Cd	0.01	0.01	0.01		0.01		0.01	0.01	0.01
Aluminum	Al	0.13	0.31	0.13	0.09	0.12	0.07	0.60	0.84	0.26
Sulfur	S	0.51	0.32	0.18	0.68	0.47	0.44	1.88	1.30	0.64
Sodium	Na	0.07	0.08	0.06	0.08	0.05	0.05	0.14	0.16	0.07
Fluorine	F									
Magnesium	Mg	0.02	0.02	0.02	0.02	0.02	0.02	0.07	0.05	0.02
Potassium	K									
Chlorine	Cl	4.41	2.79	1.92	2.55	1.81	1.74	3.91	3.01	2.36
Platinum	Pt									
Zinc	Zn	0.12	0.14	0.08	0.11	0.08	0.08	0.40	0.39	0.21
Copper	Cu		0.05	0.02				0.10	0.04	0.04
Nickel	Ni									
Iron	Fe	12.10	8.86	4.48	5.56	7.15	6.13	24.89	33.49	15.13
Vanadium	V			0.01				0.01	0.01	
Titanium	Ti									
Barium	Ba									
Calcium	Ca	0.08	0.05	0.04	0.07	0.04	0.04	0.51	0.10	0.05
Antimony	Sb						0.01			
Cobalt	Co								0.04	

TABLE B-9. CAR 733-RICH BEST IDLE W/O VAC. ADVANCE
1970 CHEVROLET MONTE CARLO

		EMISSION RATE, MG/KM (Except as Noted)								
		UNMODIFIED			WITH MALFUNCTION CONDITION					
		FTP	SET	HFET	FTP	SET	HFET	FTP	SET	HFET
Test Number,	PVM-ST	733-11	733-12	733-13	731-21	731-22	731-23	-	-	-
Barometer,	mm hg	748.0	749.3	749.0	737.1	737.1	736.3			
Humidity,	g/kg	5.5	5.3	5.7	15.0	12.1	10.8			
Temperature,	°C	24.4	25.0	28.3	27.8	30.6	30.0			
Total Fuel Sulfur, mg/km		28.52	20.04	17.73	31.31	21.93	20.69			
Avg. Exh. Oxygen, %		1.69	2.11	1.88	1.28	0.85	1.00			
Carbon Dioxide, g/km		374.1	277.3	243.3	377.0	289.4	282.9			
Fuel Cons., l/100 km		17.52	12.31	10.89	19.23	13.47	12.71			
<u>Regulated Emissions</u>										
Hydrocarbons (THC), g/km		2.09	1.18	1.24	2.10	0.96	0.75			
Carbon Monoxide, g/km		18.90	4.66	5.02	42.60	14.69	8.06			
Oxides of Nitrogen, g/km		2.58	3.17	3.61	1.54	1.75	1.92			
<u>Particulates</u>										
Total Particulates		113.32	64.33	74.82	75.42	71.31	125.83			
Sulfate		0.46	0.23	0.56	0.21	0.15	0.34			
Sulfate as % of TFS, %		0.54	0.38	1.05	0.22	0.23	0.55			
<u>Compound Group Totals</u>										
Aldehydes & Ketones		57.6	37.6	34.8	124.1	14.6	23.4			
Individual Hydrocarbons		809.8	509.4	506.5	972.9	537.8	423.0			
Organic Sulfides		0.05	0.02	0.01	0.17	0.00	0.01			
Organic Amines		0.00	0.00	0.00	0.00	0.13	0.15			
<u>Other Compounds</u>										
Ammonia		4.45	2.99	3.26	3.43	2.41	2.44			
Cyanide & Cyanogen		3.75	2.01	7.72	3.78	2.53	1.35			
Hydrogen Sulfide		0.00	0.00	0.00	0.00	0.00	0.00			
Tetramethyllead		0.00	0.00	0.00	0.00	0.00	0.00			
Ethylene Dichloride		0.00	0.00	0.00	0.00	0.00	0.00			
Tetraethyllead		--	--	--	--	--	--			
Ethylene Dibromide		0.00	0.00	0.00	0.00	0.00	0.00			

TABLE B-9. CAR 733-RICH BEST IDLE W/O VAC. ADVANCE (Cont'd)
1970 CHEVROLET MONTE CARLO

		EMISSION RATE, MG/KM (Except as Noted)								
		UNMODIFIED			WITH MALFUNCTION CONDITION					
		FTP	SET	HFET	FTP	SET	HFET	FTP	SET	HFET
Test Number,	PVM-ST	733-11	733-12	733-13	731-21	731-22	731-23	-	-	-
<u>Aldehydes and Ketones</u>										
Formaldehyde		53.48	34.77	30.87	114.35	13.33	17.91			
Acetaldehyde		4.09	2.79	3.71	9.76	1.24	4.30			
Acetone		0.00	0.00	0.00	0.00	0.00	0.00			
Isobutyraldehyde		--	--	--	--	--	--			
Methyl Ethyl Ketone		0.00	0.00	0.23	0.00	0.00	0.00			
Hexanaldehyde		0.00	0.00	0.00	0.00	0.00	1.20			
Aldehydes and Ketones		57.6	37.6	34.8	124.1	14.6	23.4			
Total as % of THC,	%	2.8	3.2	2.8	5.9	1.5	3.1			
<u>Individual Hydrocarbons</u>										
Methane		94.17	37.88	40.50	170.14	75.97	55.56			
Ethylene		215.50	167.96	164.68	234.03	148.34	127.83			
Ethane		18.83	13.70	14.31	20.25	12.86	11.02			
Acetylene		97.08	54.05	59.50	159.31	89.38	71.88			
Propane		1.69	1.14	1.04	1.36	0.76	0.39			
Propylene		99.71	74.91	72.16	90.15	52.96	45.55			
Benzene		58.82	39.71	37.94	78.68	50.14	36.59			
Toluene		224.02	120.05	116.41	218.93	107.37	74.21			
Total Individual HC		809.8	509.4	506.5	972.9	537.8	423.0			
Total as % of THC,	%	38.7	43.2	40.8	46.3	56.0	56.4			
<u>Organic Sulfides</u>										
Carbonyl Sulfide		0.01	0.01	0.00	0.12	0.00	0.00			
Methyl Sulfide		0.03	0.01	0.01	0.05	0.00	0.01			
Ethyl Sulfide		0.01	0.00	0.00	0.00	0.00	0.00			
Methyl Disulfide		0.00	0.00	0.00	0.00	0.00	0.00			
<u>Organic Amines</u>										
Monomethylamine		0.00	0.00	0.00	0.00	0.13	0.14			
Monoethylamine		0.00	0.00	0.00	0.00	0.00	0.00			
Trimethylamine		0.00	0.00	0.00	0.00	0.00	0.01			
Diethylamine		0.00	0.00	0.00	0.00	0.00	0.00			
Triethylamine		0.00	0.00	0.00	0.00	0.00	0.00			

TABLE B-9. CAR 733 - RICH BEST IDLE W/O VAC. ADVANCE (Cont'd.)
1970 CHEVROLET MONTE CARLO

		EMISSION RATE, MG/KM (Except as Noted)								
		UNMODIFIED			WITH MALFUNCTION CONDITION					
		FTP	SET	HFET	FTP	SET	HFET	FTP	SET	HFET
Test Number, PVM-ST		733-11	733-12	733-13	731-21	731-22	731-23	-	-	-
Other Elements										
Chromium	Cr									
Lead	Pb	18.26	17.52	10.77	30.27	28.42	38.91			
Manganese	Mn									
Arsenic	As									
Mercury	Hg									
Bromine	Br	8.41	11.90	6.53	14.77	24.60	39.04			
Phosphorus	P	0.13	0.14	0.13	0.14	0.11	0.19			
Silicon	Si									
Cadmium	Cd		0.01			0.02	0.02			
Aluminum	Al	0.02	0.04		0.19	0.32	0.44			
Sulfur	S	0.44	0.07	0.05	0.61	0.19	0.30			
Sodium	Na	0.02	0.06	0.05	0.07	0.10	0.18			
Fluorine	F									
Magnesium	Mg	0.01	0.02	0.01	0.03	0.03	0.04			
Potassium	K									
Chlorine	Cl	2.50	3.23	1.94	4.07	3.45	3.61			
Platinum	Pt									
Zinc	Zn		0.05	0.05	0.14	0.09	0.15			
Copper	Cu						0.05			
Nickel	Ni									
Iron	Fe	0.68	0.31	0.11	6.77	3.87	6.88			
Vanadium	V		0.01				0.01			
Titanium	Ti	0.01								
Barium	Ba									
Calcium	Ca	0.10	0.05	0.04	0.10	0.04	0.06			

TABLE B-10. CAR 741 - RICH BEST IDLE
1970 Ford Fairlane

		EMISSION RATE, MG/KM (Except as Noted)								
		UNMODIFIED			WITH MALFUNCTION CONDITION					
		FTP	SET	HFET	FTP	SET	HFET	FTP	SET	HFET
Test Number,	PVM-ST	741-11	741-12	741-13	741-21	741-22	741-23	741-31	741-32	741-33
Barometer,	mm hg	740.9	740.9	740.9	739.9	740.2	740.2	739.4	739.9	739.9
Humidity,	g/kg	12.9	9.9	10.9	11.9	11.1	11.9	12.1	11.7	10.4
Temperature,	°C	25.0	25.0	26.1	25.6	25.6	25.6	25.0	26.1	27.2
Total Fuel Sulfur, mg/km		26.93	20.79	18.90	29.37	22.19	18.71	29.26	21.05	18.54
Avg. Exh. Oxygen, %		1.54	1.50	1.36	1.03	0.95	1.01	--	1.02	1.25
Carbon Dioxide, g/km		358.2	283.5	256.9	319.5	280.1	248.8	314.5	260.3	246.8
Fuel Cons., l/100 km		16.54	12.77	11.61	18.04	13.63	11.49	17.97	12.93	11.39
<u>Regulated Emissions</u>										
Hydrocarbons (THC), g/km		2.53	1.79	1.79	3.77	2.18	1.81	3.73	2.01	1.68
Carbon Monoxide, g/km		13.55	6.33	6.04	57.94	20.59	9.26	60.19	23.06	9.36
Oxides of Nitrogen, g/km		3.94	4.58	4.79	3.43	4.87	4.54	3.21	4.11	4.05
<u>Particulates</u>										
Total Particulates		119.38	70.00	90.48	116.82	118.19	110.23	106.73	85.89	90.93
Sulfate		0.30	0.54	0.37	0.46	0.49	0.49	0.43	0.52	0.46
Sulfate as % of TFS, %		0.37	0.87	0.65	0.52	0.74	0.87	0.49	0.82	0.83
<u>Compound Group Totals</u>										
Aldehydes & Ketones		29.1	7.0	33.9	26.8	29.2	20.8	18.6	23.5	23.5
Individual Hydrocarbons		--	664.2	--	1662.8	982.4	813.3	1734.4	971.2	802.5
Organic Sulfides		0.00	0.00	0.00	0.13	0.03	0.00	0.38	0.01	0.00
Organic Amines		0.00	0.00	0.00	0.02	0.00	0.00	0.01	0.00	0.00
<u>Other Compounds</u>										
Ammonia		2.89	3.11	3.99	2.08	4.52	5.73	7.35	7.50	9.95
Cyanide & Cyanogen		0.68	0.70	0.83	0.86	0.47	1.00	3.47	0.40	0.81
Hydrogen Sulfide		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tetramethyllead		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ethylene Dichloride		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tetraethyllead		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ethylene Dibromide		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

TABLE B-10. CAR 741 - RICH BEST IDLE (Cont'd.)
1970 Ford Fairlane

		EMISSION RATE, MG/KM (Except as Noted)								
		UNMODIFIED			WITH MALFUNCTION CONDITION					
		FTP	SET	HFET	FTP	SET	HFET	FTP	SET	HFET
Test Number,	PVM-ST	741-11	741-12	741-13	741-21	741-22	741-23	741-31	741-32	741-33
<u>Aldehydes and Ketones</u>										
Formaldehyde		26.85	6.66	32.94	23.01	26.85	19.15	17.21	21.54	21.51
Acetaldehyde		2.25	0.32	0.98	3.79	2.37	1.68	1.32	1.84	1.98
Acetone		0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.10	0.00
Isobutyraldehyde		--	--	--	--	--	--	--	--	--
Methyl Ethyl Ketone		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hexanaldehyde		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Aldehydes and Ketones		29.1	7.0	33.9	26.8	29.2	20.8	18.6	23.5	23.5
Total as % of THC,	%	1.2	0.4	1.9	0.7	1.3	1.1	0.5	1.2	1.4
<u>Individual Hydrocarbons</u>										
Methane		--	49.06	--	349.13	133.47	80.86	356.83	132.70	78.52
Ethylene		--	193.82	--	360.09	278.76	245.27	377.22	274.46	248.35
Ethane		--	17.54	--	32.44	26.18	24.89	32.40	24.48	23.92
Acetylene		--	50.20	--	337.10	145.50	104.50	351.41	139.68	101.07
Propane		--	1.77	--	3.10	1.83	1.42	3.33	2.03	1.64
Propylene		--	104.43	--	157.00	128.90	120.57	161.12	127.11	119.34
Benzene		--	54.79	--	95.27	61.80	60.29	91.25	60.11	50.88
Toluene		--	192.56	--	328.65	205.91	175.53	360.80	210.61	178.79
Total Individual HC		--	664.2	--	1662.8	982.4	813.3	1734.4	971.2	802.5
Total as % of THC,	%	--	37.1	--	44.1	45.1	44.9	46.5	48.3	47.8
<u>Organic Sulfides</u>										
Carbonyl Sulfide		0.00	0.00	0.00	0.13	0.03	0.00	0.38	0.00	0.00
Methyl Sulfide		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00
Ethyl Sulfide		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Methyl Disulfide		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<u>Organic Amines</u>										
Monomethylamine		0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00
Monoethylamine		0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00
Trimethylamine		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Diethylamine		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Triethylamine		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

TABLE B-10. CAR 741 - RICH BEST IDLE (Cont'd.)
1970 Ford Fairlane

		EMISSION RATE, MG/KM (Except as Noted)								
		UNMODIFIED			WITH MALFUNCTION CONDITION					
		FTP	SET	HFET	FTP	SET	HFET	FTP	SET	HFET
Test Number, PVM-ST		741-11	741-12	741-13	741-21	741-22	741-23	741-31	741-32	741-33
Other Elements										
Chromium	Cr									
Lead	Pb	21.69	32.49	22.48	28.86	24.64	24.67	21.15	23.81	25.49
Manganese	Mn									
Arsenic	As									
Mercury	Hg									
Bromine	Br	9.05	16.00	14.95	12.62	14.09	16.13	9.93	13.84	14.33
Phosphorus	P	0.25	0.31	0.14	0.23	0.19	0.10	0.18	0.19	0.07
Silicon	Si									
Cadmium	Cd	0.01	0.02	0.01	0.01	0.02	0.02	0.01	0.01	0.01
Aluminum	Al		0.06	0.02		0.02	0.05		0.04	0.06
Sulfur	S	0.16	0.25	0.08	0.21	0.12	0.09	0.18	0.11	0.04
Sodium	Na	0.08	0.14	0.07	0.10	0.09	0.10	0.05	0.08	0.06
Fluorine	F									
Magnesium	Mg	0.02	0.06	0.02	0.03	0.03	0.02	0.02	0.03	0.01
Potassium	K									
Chlorine	Cl	4.36	7.08	6.45	7.62	5.69	6.38	5.75	6.25	5.23
Platinum	Pt									
Zinc	Zn	0.15	0.30	0.07	0.15	0.12	0.08	0.06	0.10	0.04
Copper	Cu						0.02			
Nickel	Ni									
Iron	Fe	1.01	1.20	0.34	0.63	0.34	0.26	1.64	0.76	0.40
Vanadium	V						0.01			
Titanium	Ti									
Barium	Ba									
Calcium	Ca	0.18	0.30	0.08	0.17	0.14	0.06	0.14	0.14	0.04

TABLE 11 . CAR 742 - 12 PERCENT IGNITION MISFIRE AND 10° RETARD
1970 Ford Fairlane

		EMISSION RATE, MG/KM (Except as Noted)								
		UNMODIFIED			WITH MALFUNCTION CONDITION ^a					
		FTP	SET	HFET	FTP	SET	HFET	FTP	SET	HFET
Test Number,	PVM-ST	744-11	744-12	744-13	742-21	742-22	742-23	742-31	742-32	742-33
Barometer,	mm hg	748.0	747.8	747.8	742.7	743.5	743.7	740.4	740.7	740.7
Humidity,	g/kg	8.9	8.9	8.5	13.4	11.8	11.1	12.1	10.9	11.1
* Temperature,	°C	23.9	23.9	25.0	25.6	25.6	25.6	25.0	24.4	25.6
Total Fuel Sulfur, mg/km		26.05	19.44	17.11	31.06	23.74	20.66	31.14	24.05	19.85
Avg. Exh. Oxygen, %		1.21	1.33	1.41	3.53	3.44	3.34	3.34	3.54	3.41
Carbon Dioxide, g/km		346.4	266.2	233.0	372.9	290.5	254.8	374.6	296.0	246.1
Fuel Cons., l/100 km		16.00	11.94	10.51	19.08	14.58	12.69	19.13	14.77	12.19
<u>Regulated Emissions</u>										
Hydrocarbons (THC), g/km		2.28	1.50	1.46	15.15	11.61	10.29	14.71	11.65	9.82
Carbon Monoxide, g/km		13.54	5.67	5.47	16.57	9.09	6.31	17.16	8.37	5.30
Oxides of Nitrogen, g/km		3.53	4.08	3.72	3.56	4.13	3.97	3.28	4.14	3.84
<u>Particulates</u>										
Total Particulates		85.51	76.45	64.98	185.99	125.02	123.41	172.54	124.14	116.14
Sulfate		0.20	0.37	0.29	0.68	0.74	0.66	1.18	0.90	0.96
Sulfate as % of TFS, %		0.26	0.63	0.56	0.73	1.04	1.06	1.26	1.25	1.61
<u>Compound Group Totals</u>										
Aldehydes & Ketones		19.1	7.2	7.9	92.3	117.5	42.0	--	--	--
Individual Hydrocarbons		839.8	654.5	646.6	3198.4	2500.6	2253.8	3934.4	3080.2	2730.9
Organic Sulfides		0.00	0.00	0.00	--	--	--	0.06	0.06	0.11
Organic Amines		0.01	0.00	0.00	0.02	0.02	0.05	0.00	0.02	0.05
<u>Other Compounds</u>										
Ammonia		3.79	2.44	5.96	18.46	14.66	19.45	14.74	6.61	0.90
Cyanide & Cyanogen		0.94	2.08	7.60	0.51	0.28	0.89	0.29	0.28	0.56
Hydrogen Sulfide		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tetramethyllead		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ethylene Dichloride		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tetraethyllead		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ethylene Dibromide		0.00	0.00	0.00	2.45	3.18	1.89	5.17	4.11	5.39

TABLE 11. CAR 742 - 12 PERCENT IGNITION MISFIRE AND 10° RETARD (Cont'd.)
1970 Ford Fairlane

		EMISSION RATE, MG/KM (Except as Noted)								
		UNMODIFIED			WITH MALFUNCTION CONDITION ^a					
		FTP	SET	HFET	FTP	SET	HFET	FTP	SET	HFET
Test Number,	PVM-ST	744-11	744-12	744-13	742-21	742-22	742-23	742-31	742-32	742-33
<u>Aldehydes and Ketones</u>										
Formaldehyde		18.08	6.46	7.93	87.97	108.04	32.43	--	--	--
Acetaldehyde		0.79	0.58	0.00	2.44	2.74	7.47	--	--	--
Acetone		0.26	0.19	0.00	0.14	5.99	0.00	--	--	--
Isobutyraldehyde		--	--	--	--	--	--	--	--	--
Methyl Ethyl Ketone		0.00	0.00	0.00	0.00	0.73	1.26	--	--	--
Hexanaldehyde		0.00	0.00	0.00	1.72	0.00	0.84	--	--	--
Aldehydes and Ketones		19.1	7.2	7.9	92.3	117.5	42.0	--	--	--
Total as % of THC,	%	0.8	0.5	0.5	0.6	1.0	0.4	--	--	--
<u>Individual Hydrocarbons</u>										
Methane		77.33	51.92	51.31	109.61	82.20	70.12	109.47	77.22	63.00
Ethylene		245.51	210.68	202.94	371.09	376.30	351.33	373.20	396.32	354.43
Ethane		23.11	18.94	19.03	31.24	30.53	29.50	31.91	31.72	29.31
Acetylene		76.75	65.04	68.54	104.70	84.41	82.09	114.60	81.96	84.38
Propane		2.86	1.61	1.43	2.99	2.59	2.35	4.84	8.95	10.97
Propylene		129.95	106.65	101.36	251.94	268.52	248.45	268.13	295.17	256.50
Benzene		52.54	43.61	43.55	183.94	148.54	127.04	181.23	157.41	127.69
Toluene		231.72	156.00	158.48	2142.93	1507.48	1342.96	2851.04	2031.42	1804.63
Total Individual HC		839.8	654.5	646.6	3198.4	2500.6	2253.8	3934.4	3080.2	2730.9
Total as % of THC,	%	36.8	43.6	44.3	21.1	21.5	21.9	26.7	26.4	27.8
<u>Organic Sulfides</u>										
Carbonyl Sulfide		0.00	0.00	0.00	--	--	--	0.06	0.06	0.07
Methyl Sulfide		0.00	0.00	0.00	--	--	--	0.00	0.00	0.04
Ethyl Sulfide		0.00	0.00	0.00	--	--	--	0.00	0.00	0.00
Methyl Disulfide		0.00	0.00	0.00	--	--	--	0.00	0.00	0.00
<u>Organic Amines</u>										
Monomethylamine		0.00	0.00	0.00	0.02	0.02	0.05	0.00	0.02	0.05
Monoethylamine		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Trimethylamine		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Diethylamine		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Triethylamine		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

TABLE 11. CAR 742 - 12 PERCENT IGNITION MISFIRE AND 10° RETARD (Cont'd.)
1970 Ford Fairlane

		EMISSION RATE, MG/KM (Except as Noted)								
		UNMODIFIED			WITH MALFUNCTION CONDITION ^a					
		FTP	SET	HFET	FTP	SET	HFET	FTP	SET	HFET
Test Number, PVM-ST		744-11	744-12	744-13	742-21	742-22	742-23	742-31	742-32	742-33
Other Elements										
Chromium	Cr									
Lead	Pb	18.63	27.59	10.03	32.99	17.89	20.05	33.81	18.07	16.16
Manganese	Mn				0.02					
Arsenic	As									
Mercury	Hg									
Bromine	Br	8.32	16.16	7.07	12.48	8.23	10.16	13.61	8.04	8.02
Phosphorus	P	0.24	0.28	0.07	0.28	0.17	0.13	0.27	0.15	0.12
Silicon	Si				0.04					
Cadmium	Cd		0.02	0.01		0.01	0.01	0.01	0.01	0.01
Aluminum	Al		0.05		0.18	0.04	0.03	0.03		
Sulfur	S	0.12	0.13	0.02	0.88	0.37	0.36	0.75	0.32	0.27
Sodium	Na	0.06	0.11	0.04	0.05	0.07	0.06	0.09	0.06	0.04
Fluorine	F									
Magnesium	Mg	0.02	0.03	0.01	0.03	0.02	0.02	0.04	0.02	0.01
Potassium	K									
Chlorine	Cl	3.13	5.61	3.09	4.50	2.70	2.83	5.38	2.93	2.83
Platinum	Pt									
Zinc	Zn	0.10	0.17	0.03	0.16	0.12	0.08	0.20	0.10	0.06
Copper	Cu				0.03		0.04	0.04		0.04
Nickel	Ni									
Iron	Fe	0.18	0.21	0.02	16.59	3.58	5.18	8.66	1.90	1.04
Vanadium	V				0.01					
Titanium	Ti									
Barium	Ba									
Calcium	Ca	0.19	0.22	0.03	0.17	0.11	0.06	0.20	0.10	0.05
Cobalt	Co				0.01					

TABLE B-12. CAR 743 - LEAN IDLE
1970 Ford Fairlane

		EMISSION RATE, MG/KM (Except as Noted)								
		UNMODIFIED			WITH MALFUNCTION CONDITION					
		FTP	SET	HFET	FTP	SET	HFET	FTP	SET	HFET
Test Number,	PVM-ST	743-11	743-12	743-13	743-21	743-22	743-23	743-31	743-32	743-33
Barometer,	mm hg	742.7	743.0	742.7	747.0	747.3	747.0	748.8	748.5	748.3
Humidity,	g/kg	10.9	10.9	11.1	7.2	7.4	7.2	11.5	10.0	9.6
Temperature,	°C	24.4	24.4	25.6	25.0	24.4	25.0	24.4	24.4	25.6
Total Fuel Sulfur, mg/km		26.54	20.42	17.71	25.97	19.80	17.13	26.11	21.02	18.22
Avg. Exh. Oxygen, %		1.36	1.45	1.47	4.33	3.97	2.98	4.39	3.55	2.20
Carbon Dioxide, g/km		355.8	279.1	241.4	348.9	271.2	234.9	349.6	287.3	249.1
Fuel Cons., l/100 km		16.30	12.54	10.88	15.95	12.16	10.52	16.04	12.91	11.19
<u>Regulated Emissions</u>										
Hydrocarbons (THC), g/km		2.24	1.60	1.52	3.08	2.15	1.66	3.46	2.21	1.78
Carbon Monoxide, g/km		12.02	6.17	5.56	9.55	4.35	3.95	9.69	5.14	4.76
Oxides of Nitrogen, g/km		3.52	4.41	4.22	3.78	4.24	3.96	3.69	5.17	4.71
<u>Particulates</u>										
Total Particulates		81.82	89.15	64.41	87.84	85.34	79.26	94.25	96.58	80.53
Sulfate		0.32	0.57	0.27	0.56	0.67	0.31	0.43	0.69	0.23
Sulfate as % of TFS, %		0.40	0.93	0.51	0.72	1.13	0.60	0.55	1.09	0.42
<u>Compound Group Totals</u>										
Aldehydes & Ketones		20.3	34.8	39.2	9.6	8.2	12.5	31.7	12.3	16.6
Individual Hydrocarbons		857.5	704.2	693.8	1005.6	711.8	653.7	1053.2	766.6	714.4
Organic Sulfides		--	--	--	--	--	--	0.10	0.05	0.00
Organic Amines		0.10	0.04	0.01	0.03	0.00	0.00	0.03	0.02	0.03
<u>Other Compounds</u>										
Ammonia		7.67	--	6.94	2.48	2.33	4.59	4.56	7.05	4.23
Cyanide & Cyanogen		1.03	2.21	6.98	1.83	0.67	2.54	2.20	0.88	5.38
Hydrogen Sulfide		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tetramethyllead		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ethylene Dichloride		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tetraethyllead		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ethylene Dibromide		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

TABLE B-12. CAR 743 - LEAN IDLE (Cont'd.)
1970 Ford Fairlane

		EMISSION RATE, MG/KM (Except as Noted)								
		UNMODIFIED			WITH MALFUNCTION CONDITION					
		FTP	SET	HFET	FTP	SET	HFET	FTP	SET	HFET
Test Number,	PVM-ST	743-11	743-12	743-13	743-21	743-22	743-23	743-31	743-32	743-33
<u>Aldehydes and Ketones</u>										
Formaldehyde		18.94	31.91	37.43	9.04	8.02	11.90	29.03	10.64	15.59
* Acetaldehyde		1.21	2.33	1.20	0.47	0.19	0.63	2.69	1.61	1.05
Acetone		0.19	0.52	0.59	0.09	0.00	0.00	0.00	0.00	0.00
Isobutyraldehyde		--	--	--	--	--	--	--	--	--
Methyl Ethyl Ketone		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hexanaldehyde		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Aldehydes and Ketones		20.3	34.8	39.2	9.6	8.2	12.5	31.7	12.3	16.6
Total as % of THC,	%	0.9	2.2	2.6	0.3	0.4	0.8	0.9	0.6	0.9
<u>Individual Hydrocarbons</u>										
Methane		76.39	56.20	51.26	67.62	45.93	43.78	66.62	51.79	49.81
Ethylene		250.10	221.35	212.31	294.45	237.50	208.59	291.46	249.06	224.21
Ethane		23.49	20.72	20.38	23.89	18.55	17.20	24.18	20.09	19.47
Acetylene		77.94	72.53	74.09	63.98	62.06	65.47	55.89	59.51	67.91
Propane		2.26	1.67	1.52	2.56	1.76	1.17	2.49	1.94	1.53
Propylene		134.46	113.74	109.44	163.56	124.23	105.45	162.65	131.13	115.65
Benzene		54.28	45.95	52.52	56.69	40.99	41.69	62.65	48.56	46.05
Toluene		238.57	172.03	172.32	332.89	180.80	170.32	387.25	204.56	189.72
Total Individual HC		857.5	704.2	693.8	1005.6	711.8	653.7	1053.2	766.6	714.4
Total as % of THC,	%	38.3	44.0	45.6	32.6	33.1	39.4	30.4	34.7	40.1
<u>Organic Sulfides</u>										
Carbonyl Sulfide		--	--	--	--	--	--	0.10	0.05	0.00
Methyl Sulfide		--	--	--	--	--	--	0.00	0.00	0.00
Ethyl Sulfide		--	--	--	--	--	--	0.00	0.00	0.00
Methyl Disulfide		--	--	--	--	--	--	0.00	0.00	0.00
<u>Organic Amines</u>										
Monomethylamine		0.07	0.03	0.01	0.03	0.00	0.00	0.03	0.01	0.03
Monoethylamine		0.03	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.00
Trimethylamine		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Diethylamine		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Triethylamine		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

TABLE B-12. CAR 743 - LEAN IDLE (Cont'd.)
1970 Ford Fairlane

		EMISSION RATE, MG/KM (Except as Noted)								
		UNMODIFIED			WITH MALFUNCTION CONDITION					
		FTP	SET	HFET	FTP	SET	HFET	FTP	SET	HFET
Test Number, PVM-ST		743-11	743-12	743-13	743-21	743-22	743-23	743-31	743-32	743-33
Other Elements										
Chromium	Cr									
Lead	Pb	17.84	32.31	19.99	17.05	23.46	18.87	21.60	36.86	28.70
Manganese	Mn									
Arsenic	As									
Mercury	Hg									
Bromine	Br	9.08	20.18	14.11	8.16	13.62	13.21	10.12	23.68	20.24
Phosphorus	P	0.21	0.25	0.11	0.19	0.22	0.11	0.22	0.24	0.15
Silicon	Si									
Cadmium	Cd		0.02	0.01		0.01	0.01	0.01	0.02	0.01
Aluminum	Al		0.09	0.04		0.01	0.02		0.12	0.05
Sulfur	S	0.10	0.15	0.03	0.13	0.15	0.06	0.09	0.17	0.06
Sodium	Na	0.05	0.14	0.07	0.07	0.09	0.08	0.06	0.12	0.07
Fluorine	F									
Magnesium	Mg	0.02	0.03	0.02	0.02	0.02	0.02	0.02	0.04	0.02
Potassium	K									
Chlorine	Cl	3.73	6.87	6.28	3.05	4.53	5.91	3.51	6.35	6.61
Platinum	Pt									
Zinc	Zn	0.08	0.18	0.04	0.10	0.13	0.05	0.09	0.14	0.06
Copper	Cu		0.02			0.03		0.02		0.03
Nickel	Ni									
Iron	Fe	0.58	0.79	0.08	0.29	0.34	0.11	0.29	0.33	0.12
Vanadium	V									
Titanium	Ti									
Barium	Ba									
Calcium	Ca	0.16	0.22	0.06	0.16	0.17	0.07	0.16	0.18	0.08

APPENDIX C

FTP INDIVIDUAL SAMPLE EMISSIONS RESULTS

TABLE C-1. FTP INDIVIDUAL SAMPLE EMISSIONS RESULTS
Test Series 711 - Rich Idle

	Emissions in mg/km					
	Unmodified		Malfunction			
	711-11		711-21		711-31	
	COLD-UDDS	HOT-UDDS	COLD-UDDS	HOT-UDDS	COLD-UDDS	HOT-UDDS
Total Particulate	125.63	101.21	104.22	83.15	98.70	76.45
Sulfates	0.30	0.62	0.83	0.33	0.84	0.61
Ammonia	2.58	2.84	2.02	2.17	3.79	3.90
Cyanides & Cyanogen	3.38	3.34	5.60	6.81	5.25	4.54
Hydrogen Sulfide	0.36	0.00	0.00	0.00	0.23	0.00
<u>Aldehydes & Ketones</u>						
Formaldehyde	35.61	37.26	34.01	27.23	31.00	33.19
Acetaldehyde	5.46	5.92	6.16	5.17	6.46	6.72
Acetone	0.09	1.05	9.56	9.88	2.82	4.65
Isobutyraldehyde	--	--	--	--	--	--
Methyl ethyl ketone	0.40	0.62	0.31	0.21	0.41	0.51
Hexanaldehyde	0.00	0.00	0.00	0.00	0.00	0.00
<u>Organic Sulfides</u>						
Carbonyl sulfide	0.08	0.06	0.01	0.02	0.02	0.01
Methyl sulfide	0.00	0.04	0.00	0.02	0.00	0.01
Ethyl sulfide	0.00	0.00	0.00	0.00	0.00	0.01
Methyl disulfide	0.00	0.00	0.00	0.00	0.00	0.00
<u>Organic Amines</u>						
Monomethylamine	0.01	0.06	0.07	0.05	0.05	0.03
Monoethylamine & dimethylamine	0.00	0.00	0.03	0.01	0.30	0.15
Trimethylamine	0.00	0.00	0.00	0.00	0.00	0.05
Diethylamine	0.00	0.00	0.00	0.00	0.00	0.00
Triethylamine	0.00	0.00	0.00	0.00	0.00	0.00

	Emissions in ppm				Emissions in ppm				Emissions in ppm			
	COLD-UDDS		HOT-UDDS		COLD-UDDS		HOT-UDDS		COLD-UDDS		HOT-UDDS	
	1	2	3	4	1	2	3	4	1	2	3	4
<u>Individual Hydrocarbons</u>												
Methane	33.87	3.95	5.88	3.34	32.09	10.44	10.08	9.41	32.45	10.83	11.40	10.07
Ethylene	37.07	12.05	17.46	10.93	37.69	18.08	22.02	16.87	37.10	18.94	25.48	17.79
Ethane	3.18	1.04	1.67	0.93	3.13	1.58	1.91	1.48	3.12	1.58	2.23	1.49
Acetylene	52.61	6.06	8.91	5.31	46.16	12.50	14.16	11.61	48.63	13.72	17.38	12.94
Propane	0.32	0.19	0.22	0.18	0.32	0.19	0.18	0.15	0.24	0.15	1.68	2.56
Propylene	14.03	5.04	7.27	4.62	14.60	6.79	8.53	6.28	14.46	7.13	10.04	6.64
Benzene	15.87	4.07	6.61	3.86	14.10	7.37	8.09	7.14	13.66	7.88	8.72	7.35
Toluene	78.90	20.58	43.57	16.88	47.74	19.03	21.64	17.51	39.60	18.04	21.20	15.90
<u>Lead Components</u>												
Tetramethyllead	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ethylene Dichloride	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tetraethyllead	--	--	--	--	--	--	--	--	--	--	--	--
Ethylene Dibromide	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

TABLE C-2. FTP INDIVIDUAL SAMPLE EMISSIONS RESULTS
Test Series 712 - 12 Percent Misfire

	Emissions in mg/km					
	Unmodified		Malfunction			
	712-11		712-21		712-41	
	COLD-UDDS	HOT-UDDS	COLD-UDDS	HOT-UDDS	COLD-UDDS	HOT-UDDS
Total Particulate	108.25	75.70	183.32	94.32	152.69	86.80
Sulfates	1.03	0.75	0.26	0.26	0.64	0.85
Ammonia	4.60	5.15	1.39	2.12	1.90	1.99
Cyanides & Cyanogen	3.56	3.51	0.65	1.65	1.87	0.56
Hydrogen Sulfide	0.00	0.00	0.00	0.00	0.00	0.00
<u>Aldehydes & Ketones</u>						
Formaldehyde	30.11	24.97	163.00	229.52	253.15	180.16
Acetaldehyde	4.70	2.07	20.17	37.54	45.65	30.31
Acetone	0.93	0.67	7.79	13.48	8.64	3.87
Isobutyraldehyde	--	--	--	--	--	--
Methyl ethyl ketone	0.00	0.00	3.20	6.38	3.03	1.95
Hexanaldehyde	0.00	0.00	0.00	3.02	4.41	3.30
<u>Organic Sulfides</u>						
Carbonyl sulfide	0.01	0.02	0.02	0.04	0.00	0.01
Methyl sulfide	0.02	0.05	0.03	0.02	0.01	0.02
Ethyl sulfide	0.01	0.01	0.00	0.00	0.00	0.00
Methyl disulfide	0.00	0.00	0.00	0.00	0.00	0.00
<u>Organic Amines</u>						
Monomethylamine	0.09	0.12	0.36	0.37	0.48	0.27
Monoethylamine & dimethylamine	0.00	0.00	0.00	0.00	0.00	0.12
Trimethylamine	0.00	0.00	0.00	0.00	0.00	0.00
Diethylamine	0.00	0.00	0.00	0.00	0.00	0.00
Triethylamine	0.00	0.00	0.00	0.00	0.00	0.00

	Emissions in ppm				Emissions in ppm				Emissions in ppm			
	COLD-UDDS		HOT-UDDS		COLD-UDDS		HOT-UDDS		COLD-UDDS		HOT-UDDS	
	1	2	3	4	1	2	3	4	1	2	3	4
<u>Individual Hydrocarbons</u>												
Methane	19.11	1.50	3.77	1.38	26.87	4.07	6.79	3.51	26.15	5.37	7.24	4.58
Ethylene	28.61	10.02	17.98	9.76	54.28	25.26	42.16	23.98	62.82	30.41	46.89	29.35
Ethane	2.36	0.73	1.44	0.68	4.52	2.13	3.37	1.90	5.36	2.66	3.73	2.43
Acetylene	24.60	3.97	7.79	3.66	37.66	6.36	9.94	5.37	37.45	8.06	11.33	6.88
Propane	0.18	0.00	0.13	0.00	0.40	0.25	0.31	0.21	0.39	0.23	0.33	0.22
Propylene	11.63	4.35	7.74	4.16	32.74	17.49	29.16	16.92	37.69	20.18	31.15	19.82
Benzene	10.02	3.15	5.39	2.79	31.61	19.46	28.92	16.63	35.89	15.81	22.23	15.94
Toluene	28.13	8.29	18.11	7.01	303.23	181.46	248.65	177.50	346.35	198.82	253.08	208.22
<u>Lead Components</u>												
Tetramethyllead	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ethylene Dichloride	--	--	--	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tetraethyllead	--	--	--	--	--	--	--	--	--	--	--	--
Ethylene Dibromide	0.00	0.00	0.00	0.00	0.16	0.05	0.07	0.03	0.07	0.02	0.05	0.04

TABLE C-3. FTP INDIVIDUAL SAMPLE EMISSION RESULTS
Test 712-31 - 12 Percent Misfire Plus Unknown Malfunction

	Emissions in mg/km	
	COLD-UDDS	HOT-UDDS
Total Particulate	139.51	89.09
Sulfates	0.98	0.97
Ammonia	4.40	5.07
Cyanides & Cyanogen	1.22	1.76
Hydrogen Sulfide	0.23	0.23
<u>Aldehydes & Ketones</u>		
Formaldehyde	136.47	257.13
Acetaldehyde	11.68	22.55
Acetone	2.44	6.39
Isobutyraldehyde	--	--
Methyl ethyl ketone	1.34	3.01
Hexanaldehyde	0.00	114.90
<u>Organic Sulfides</u>		
Carbonyl sulfide	0.02	0.01
Methyl sulfide	0.06	0.01
Ethyl sulfide	0.01	0.00
Methyl disulfide	0.00	0.00
<u>Organic Amines</u>		
Monomethylamine	0.20	0.44
Monoethylamine & dimethylamine	0.01	0.00
Trimethylamine	0.00	0.00
Diethylamine	0.00	0.00
Triethylamine	0.00	0.00

	Emissions in ppm			
	COLD-UDDS		HOT-UDDS	
	1	2	3	4
<u>Individual Hydrocarbons</u>				
Methane	30.97	5.83	8.73	4.94
Ethylene	68.84	33.21	55.58	32.42
Ethane	6.11	3.01	4.70	2.69
Acetylene	41.25	7.50	11.07	6.28
Propane	0.74	0.27	0.37	0.21
Propylene	42.79	23.33	39.84	23.58
Benzene	60.73	27.21	42.11	37.44
Toluene	884.20	517.88	748.71	494.06
<u>Lead Components</u>				
Tetramethyllead	0.00	0.00	0.00	0.00
Ethylene Dichloride	0.00	0.00	0.00	0.00
Tetraethyllead	--	--	--	--
Ethylene Dibromide	0.25	0.12	0.18	0.10

TABLE C-4. FTP INDIVIDUAL SAMPLE EMISSIONS RESULTS
Test Series 721 - Rich Idle

	Emissions in mg/km					
	Unmodified		Malfunction			
	721-11		721-21		721-31	
	COLD-UDDS	HOT-UDDS	COLD-UDDS	HOT-UDDS	COLD-UDDS	HOT-UDDS
Total Particulate	86.33	54.85	34.85	23.60	131.76	65.00
Sulfates	0.23	0.11	2.03	0.75	1.43	0.34
Ammonia	1.52	1.14	5.36	3.36	6.38	3.14
Cyanides & Cyanogen	4.65	3.87	--	--	10.44	9.52
Hydrogen Sulfide	0.00	0.00	0.00	0.00	0.00	0.00
<u>Aldehydes & Ketones</u>						
Formaldehyde	9.35	5.70	9.30	11.20	10.87	5.64
Acetaldehyde	0.00	0.00	1.31	0.72	1.85	2.22
Acetone	0.00	0.00	0.27	0.00	0.00	0.45
Isobutyraldehyde	--	--	--	--	--	--
Methyl ethyl ketone	0.00	0.00	0.00	0.00	0.00	0.00
Hexanaldehyde	0.00	0.00	0.00	0.00	0.00	0.00
<u>Organic Sulfides</u>						
Carbonyl sulfide	0.00	0.00	--	0.01	0.00	0.00
Methyl sulfide	0.00	0.00	--	0.03	0.00	0.00
Ethyl sulfide	0.00	0.00	--	0.00	0.00	0.00
Methyl disulfide	0.00	0.00	--	0.00	0.00	0.00
<u>Organic Amines</u>						
Monomethylamine	0.00	0.02	0.05	0.00	0.00	0.00
Monoethylamine & dimethylamine	0.01	0.00	0.15	0.07	0.00	0.00
Trimethylamine	0.00	0.00	0.02	0.00	0.00	0.00
Diethylamine	0.00	0.00	0.00	0.00	0.00	0.00
Triethylamine	0.00	0.00	0.00	0.00	0.00	0.00

	Emissions in ppm				Emissions in ppm				Emissions in ppm			
	COLD-UDDS		HOT-UDDS		COLD-UDDS		HOT-UDDS		COLD-UDDS		HOT-UDDS	
	1	2	3	4	1	2	3	4	1	2	3	4
<u>Individual Hydrocarbons</u>												
Methane	26.10	4.25	7.96	4.41	23.24	14.17	14.58	14.27	28.26	15.11	16.73	14.96
Ethylene	33.63	12.54	18.49	11.98	33.98	21.87	26.09	21.40	35.17	21.75	27.25	21.69
Ethane	2.75	1.15	1.60	1.07	3.04	1.78	2.28	1.72	3.22	1.82	2.44	1.86
Acetylene	62.09	10.07	16.84	9.54	30.32	15.71	18.99	16.45	39.27	16.74	21.48	17.13
Propane	0.18	0.00	0.02	0.00	0.28	0.19	0.23	0.18	0.30	0.20	0.24	0.20
Propylene	12.88	5.31	7.77	4.96	14.04	8.09	10.11	7.71	14.18	7.94	10.40	7.91
Benzene	10.28	4.24	6.32	4.08	10.78	9.26	9.11	7.98	11.18	9.29	8.54	7.52
Toluene	32.42	15.10	22.83	13.74	36.70	22.73	29.57	22.69	38.80	20.78	28.16	21.06
<u>Lead Components</u>												
Tetramethyllead	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ethylene Dichloride	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tetraethyllead	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ethylene Dibromide	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

TABLE C-5. FTP INDIVIDUAL SAMPLE EMISSIONS RESULTS
Test Series 722 - 12 Percent Misfire

	Emissions in mg/km					
	Unmodified		Malfunction			
	722-11		722-21		722-31	
	COLD-UDDS	HOT-UDDS	COLD-UDDS	HOT-UDDS	COLD-UDDS	HOT-UDDS
Total Particulate	141.70	73.06	116.00	90.72	73.28	69.49
Sulfates	0.33	0.05	0.26	0.14	0.18	0.16
Ammonia	4.33	5.85	8.76	3.01	1.96	2.06
Cyanides & Cyanogen	5.33	4.33	3.21	1.74	3.76	2.67
Hydrogen Sulfide	0.00	0.00	0.00	0.00	0.00	0.00
<u>Aldehydes & Ketones</u>						
Formaldehyde	--	6.65	35.47	49.67	29.95	65.54
Acetaldehyde	--	0.00	2.24	4.82	4.88	5.62
Acetone	--	0.52	0.56	0.65	0.00	0.00
Isobutyraldehyde	--	--	--	--	--	--
Methyl ethyl ketone	--	0.00	0.00	0.00	0.00	0.00
Hexanaldehyde	--	0.00	0.00	0.00	0.00	0.00
<u>Organic Sulfides</u>						
Carbonyl sulfide	0.01	0.01	0.06	0.01	0.01	0.00
Methyl sulfide	0.00	0.00	0.00	0.00	0.00	0.00
Ethyl sulfide	0.00	0.00	0.00	0.00	0.00	0.00
Methyl disulfide	0.00	0.00	0.00	0.00	0.00	0.00
<u>Organic Amines</u>						
Monomethylamine	0.03	0.00	0.00	0.00	0.00	0.01
Monoethylamine & dimethylamine	0.00	0.00	0.01	0.00	0.00	0.01
Trimethylamine	0.00	0.00	0.00	0.00	0.00	0.00
Diethylamine	0.00	0.00	0.00	0.00	0.00	0.00
Triethylamine	0.00	0.00	0.00	0.00	0.00	0.00

	Emissions in ppm				Emissions in ppm				Emissions in ppm			
	COLD-UDDS		HOT-UDDS		COLD-UDDS		HOT-UDDS		COLD-UDDS		HOT-UDDS	
	1	2	3	4	1	2	3	4	1	2	3	4
<u>Individual Hydrocarbons</u>												
Methane	24.04	6.15	8.30	5.54	27.73	7.28	11.57	7.11	19.92	5.25	8.40	5.49
Ethylene	31.68	14.53	18.75	13.36	35.18	17.09	26.00	17.07	30.97	15.96	24.02	15.80
Ethane	2.76	1.34	1.65	1.24	3.01	1.52	2.27	1.51	2.71	1.37	1.95	1.37
Acetylene	34.50	8.30	11.10	7.50	36.89	8.21	14.24	8.27	37.60	10.17	15.46	10.14
Propane	0.56	0.41	0.39	0.30	0.37	0.22	0.27	0.20	0.28	0.18	0.28	0.20
Propylene	13.23	6.15	8.09	5.66	16.78	8.88	14.02	8.91	15.44	8.41	13.28	8.21
Benzene	11.37	5.49	6.82	4.90	15.99	15.82	15.67	6.69	21.90	17.51	10.52	9.22
Toluene	38.26	15.07	22.12	14.07	190.96	122.62	158.35	108.24	184.28	131.62	128.46	105.02
<u>Lead Components</u>												
Tetramethyllead	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ethylene Dichloride	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tetraethyllead	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ethylene Dibromide	0.00	0.00	0.00	0.00	0.05	0.02	0.03	0.02	0.04	0.02	0.03	0.02

TABLE C-6. FTP INDIVIDUAL SAMPLE EMISSIONS RESULTS
Test Series 723 - Lean Idle

	Emissions in mg/km					
	Unmodified		Malfunction			
	723-11		723-21		723-31	
	COLD-UDDS	HOT-UDDS	COLD-UDDS	HOT-UDDS	COLD-UDDS	HOT-UDDS
Total Particulate	89.48	60.98	96.92	61.83	93.38	72.99
Sulfates	0.67	0.61	0.69	0.41	0.51	0.48
Ammonia	2.63	1.88	0.00	0.00	3.68	3.63
Cyanides & Cyanogen	7.94	5.66	5.66	4.14	5.75	4.45
Hydrogen Sulfide	0.00	0.00	0.00	0.00	0.00	0.00
<u>Aldehydes & Ketones</u>						
Formaldehyde	7.04	14.59	24.09	40.60	36.23	38.50
Acetaldehyde	7.10	6.73	7.64	9.07	7.02	6.38
Acetone	0.00	0.00	0.00	0.00	0.00	0.00
Isobutyraldehyde	--	--	--	--	--	--
Methyl ethyl ketone	0.00	0.00	0.00	0.00	0.00	0.00
Hexanaldehyde	0.00	0.00	0.00	0.00	0.26	0.00
<u>Organic Sulfides</u>						
Carbonyl sulfide	--	--	0.04	0.02	0.03	0.01
Methyl sulfide	--	--	0.00	0.00	0.03	0.01
Ethyl sulfide	--	--	0.00	0.00	0.00	0.00
Methyl disulfide	--	--	0.00	0.00	0.00	0.00
<u>Organic Amines</u>						
Monomethylamine	0.07	0.00	0.10	0.10	0.09	0.02
Monoethylamine & dimethylamine	0.06	0.00	0.03	0.02	0.01	0.00
Trimethylamine	0.04	0.00	0.00	0.00	0.00	0.00
Diethylamine	0.00	0.00	0.00	0.00	0.00	0.00
Triethylamine	0.00	0.00	0.00	0.00	0.00	0.00

	Emissions in ppm				Emissions in ppm				Emissions in ppm			
	COLD-UDDS		HOT-UDDS		COLD-UDDS		HOT-UDDS		COLD-UDDS		HOT-UDDS	
	1	2	3	4	1	2	3	4	1	2	3	4
<u>Individual Hydrocarbons</u>												
Methane	24.47	3.91	7.03	3.31	17.10	2.77	6.14	2.78	20.84	3.13	6.51	2.83
Ethylene	30.77	11.55	16.80	10.61	28.72	16.45	20.93	16.83	28.88	15.76	21.24	16.03
Ethane	2.67	1.09	1.44	0.98	2.54	1.40	1.76	1.43	2.60	1.39	1.86	1.34
Acetylene	36.40	5.55	9.01	4.88	20.45	3.45	7.02	3.35	24.96	3.38	6.99	3.39
Propane	0.23	0.11	0.17	0.10	0.30	0.19	0.22	0.00	0.33	0.20	0.29	0.19
Propylene	12.47	5.19	7.31	4.75	13.09	8.90	10.77	9.10	12.68	8.19	10.58	8.45
Benzene	10.23	4.43	6.81	3.49	9.06	4.62	6.63	4.71	8.98	4.21	8.90	6.14
Toluene	33.77	15.24	22.78	13.16	39.28	36.76	51.82	37.54	38.84	33.73	55.53	38.28
<u>Lead Components</u>												
Tetramethyllead	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ethylene Dichloride	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tetraethyllead	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ethylene Dibromide	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

[illegible]

TABLE C-8. FTP INDIVIDUAL SAMPLE EMISSIONS RESULTS
Test Series 732 - 12 Percent Misfire

	Emissions in mg/km					
	Unmodified		Malfunction			
	732-11		732-21		732-31	
	COLD-UDDS	HOT-UDDS	COLD-UDDS	HOT-UDDS	COLD-UDDS	HOT-UDDS
Total Particulate	132.53	96.94	306.54	133.73	322.34	171.82
Sulfates	0.69	0.60	3.22	1.98	3.93	1.40
Ammonia	5.33	3.63	5.03	6.06	3.93	3.71
Cyanides & Cyanogen	2.87	3.08	1.80	1.76	1.42	1.96
Hydrogen Sulfide	0.00	0.00	0.00	0.00	0.00	0.00
<u>Aldehydes & Ketones</u>						
Formaldehyde	30.65	30.80	154.27	202.12	136.05	203.31
Acetaldehyde	4.61	5.08	39.50	33.13	33.51	32.10
Acetone	1.47	0.31	11.06	5.78	14.56	13.64
Isobutyraldehyde	--	--	--	--	--	--
Methyl ethyl ketone	0.00	0.00	0.00	3.49	3.26	3.96
Hexanaldehyde	0.00	0.00	0.90	2.58	2.61	2.29
<u>Organic Sulfides</u>						
Carbonyl sulfide	0.02	0.02	0.01	0.01	0.02	0.01
Methyl sulfide	0.02	0.04	0.00	0.04	0.17	0.07
Ethyl sulfide	0.00	0.00	0.00	0.00	0.00	0.00
Methyl disulfide	0.00	0.00	0.00	0.00	0.00	0.00
<u>Organic Amines</u>						
Monomethylamine	0.03	0.05	0.17	0.19	0.09	0.13
Monoethylamine & dimethylamine	0.02	0.03	0.00	0.00	0.00	0.00
Trimethylamine	0.00	0.01	0.00	0.00	0.00	0.00
Diethylamine	0.00	0.00	0.00	0.00	0.00	0.00
Triethylamine	0.00	0.00	0.00	0.00	0.00	0.00

	Emissions in ppm				Emissions in ppm				Emissions in ppm			
	COLD-UDDS		HOT-UDDS		COLD-UDDS		HOT-UDDS		COLD-UDDS		HOT-UDDS	
	1	2	3	4	1	2	3	4	1	2	3	4
<u>Individual Hydrocarbons</u>												
Methane	16.68	2.76	4.55	4.84	21.46	4.22	7.19	4.07	22.95	3.94	6.80	3.33
Ethylene	28.95	12.80	18.55	13.65	65.76	27.89	46.22	27.16	62.70	28.23	45.86	26.50
Ethane	2.18	0.97	1.37	1.02	5.43	2.14	3.44	2.02	5.14	2.10	3.41	1.87
Acetylene	19.03	5.16	8.35	7.45	25.96	6.15	10.96	5.69	29.07	5.97	10.77	5.24
Propane	0.30	0.07	0.00	0.00	0.64	0.32	0.42	0.23	0.37	0.05	0.14	0.02
Propylene	12.30	5.79	8.12	6.17	29.13	19.03	30.83	18.53	37.96	19.31	30.17	18.24
Benzene	9.28	3.86	5.90	4.07	23.66	13.05	17.15	11.67	24.54	21.13	16.46	43.18
Toluene	33.20	16.27	25.71	17.52	267.30	176.92	224.13	177.22	311.63	191.60	234.63	208.24
<u>Lead Components</u>												
Tetramethyllead	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ethylene Dichloride	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.07	0.00
Tetraethyllead	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ethylene Dibromide	0.00	0.00	0.00	0.00	0.09	0.03	0.04	0.05	0.05	0.03	0.04	0.03

TABLE C-9. FTP INDIVIDUAL SAMPLE EMISSIONS RESULTS
Test Series 733 - Rich Idle Without Vacuum Advance

	Emissions in mg/km			
	Unmodified		Malfunction	
	733-11		731-21	
	COLD-UDDS	HOT-UDDS	COLD-UDDS	HOT-UDDS
Total Particulate	161.56	76.93	33.86	106.77
Sulfates	0.25	0.62	0.00	0.37
Ammonia	4.33	4.54	3.70	3.23
Cyanides & Cyanogen	3.35	4.06	3.66	3.87
Hydrogen Sulfide	0.00	0.00	0.00	0.00
<u>Aldehydes & Ketones</u>				
Formaldehyde	49.64	56.37	225.75	30.31
Acetaldehyde	4.50	3.78	18.22	3.38
Acetone	0.00	0.00	0.00	0.00
Isobutyraldehyde	--	--	--	--
Methyl ethyl ketone	0.00	0.00	0.00	0.00
Hexanaldehyde	0.00	0.00	0.00	0.00
<u>Organic Sulfides</u>				
Carbonyl sulfide	0.01	0.01	0.14	0.10
Methyl sulfide	0.03	0.03	0.02	0.07
Ethyl sulfide	0.01	0.01	0.00	0.00
Methyl disulfide	0.00	0.00	0.00	0.00
<u>Organic Amines</u>				
Monomethylamine	0.00	0.00	0.00	0.00
Monoethylamine & dimethylamine	0.00	0.00	0.00	0.00
Trimethylamine	0.00	0.00	0.00	0.00
Diethylamine	0.00	0.00	0.00	0.00
Triethylamine	0.00	0.00	0.00	0.00

	Emissions in ppm				Emissions in ppm			
	COLD-UDDS		HOT-UDDS		COLD-UDDS		HOT-UDDS	
	1	2	3	4	1	2	3	4
<u>Individual Hydrocarbons</u>								
Methane	33.08	3.03	4.82	2.50	32.31	11.16	11.59	11.19
Ethylene	41.90	15.92	24.19	11.91	37.03	19.96	24.50	19.30
Ethane	3.52	1.33	1.90	1.19	2.89	1.60	1.94	1.62
Acetylene	35.95	5.10	8.55	4.19	37.62	12.60	16.52	11.93
Propane	0.35	0.12	0.16	0.11	0.22	0.11	0.09	0.10
Propylene	17.03	7.85	11.28	7.53	14.27	7.66	9.31	7.54
Benzene	14.04	4.80	6.33	3.95	12.55	7.49	8.38	7.45
Toluene	47.79	17.77	22.24	17.88	36.71	20.36	22.49	19.93
<u>Lead Components</u>								
Tetramethyllead	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ethylene Dichloride	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tetraethyllead	--	--	--	--	--	--	--	--
Ethylene Dibromide	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

TABLE C-10. FTP INDIVIDUAL SAMPLE EMISSIONS RESULTS
Test Series 741 - Rich Idle

	Emissions in mg/km					
	Unmodified		Malfunction			
	741-11		741-21		741-31	
	COLD-UDDS	HOT-UDDS	COLD-UDDS	HOT-UDDS	COLD-UDDS	HOT-UDDS
Total Particulate	125.75	114.58	119.64	114.70	120.44	96.39
Sulfates	0.31	0.29	0.55	0.40	0.44	0.42
Ammonia	3.41	2.50	1.38	2.60	6.75	7.80
Cyanides & Cyanogen	0.86	0.55	1.61	0.30	3.73	3.28
Hydrogen Sulfide	0.00	0.00	0.00	0.00	0.00	0.00
<u>Aldehydes & Ketones</u>						
Formaldehyde	8.62	40.61	19.53	25.63	15.36	18.60
Acetaldehyde	1.12	3.11	2.16	5.02	1.38	1.28
Acetone	0.00	0.00	0.00	0.00	0.26	0.00
Isobutyraldehyde	--	--	--	--	--	--
Methyl ethyl ketone	0.00	0.00	0.00	0.00	0.00	0.00
Hexanaldehyde	0.00	0.00	0.00	0.00	0.00	0.00
<u>Organic Sulfides</u>						
Carbonyl sulfide	0.00	0.00	0.14	0.13	0.63	0.00
Methyl sulfide	0.00	0.00	0.01	0.00	0.00	0.00
Ethyl sulfide	0.00	0.00	0.00	0.00	0.00	0.00
Methyl disulfide	0.00	0.00	0.00	0.00	0.00	0.00
<u>Organic Amines</u>						
Monomethylamine	0.00	0.00	0.00	0.00	0.00	0.00
Monoethylamine & dimethylamine	0.00	0.00	0.02	0.02	0.00	0.00
Trimethylamine	0.00	0.00	0.00	0.00	0.00	0.00
Diethylamine	0.00	0.00	0.00	0.00	0.00	0.00
Triethylamine	0.00	0.00	0.00	0.00	0.00	0.00

	Emissions in ppm				Emissions in ppm				Emissions in ppm			
	COLD-UDDS		HOT-UDDS		COLD-UDDS		HOT-UDDS		COLD-UDDS		HOT-UDDS	
	1	2	3	4	1	2	3	4	1	2	3	4
<u>Individual Hydrocarbons</u>												
Methane	21.96	3.26	--	2.83	44.81	33.49	27.66	23.31	46.04	36.25	27.71	22.06
Ethylene	43.41	20.08	--	20.82	51.43	31.29	42.94	29.17	51.13	32.68	16.22	30.88
Ethane	4.03	1.68	--	1.55	4.53	2.54	3.68	2.36	4.31	2.46	3.76	2.42
Acetylene	23.50	5.10	--	4.70	57.90	39.10	36.60	25.00	59.40	41.10	39.12	25.32
Propane	0.44	0.21	--	0.47	0.40	0.27	0.34	0.24	0.41	0.28	0.37	0.27
Propylene	21.48	11.37	--	11.53	22.08	13.15	19.38	12.87	21.57	13.51	21.03	12.92
Benzene	11.31	24.87	--	3.63	13.19	8.36	10.17	10.18	13.70	9.41	10.84	7.81
Toluene	49.60	21.15	--	17.67	51.53	30.52	37.50	29.32	57.71	35.25	41.12	29.99
<u>Lead Components</u>												
Tetramethyllead	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ethylene Dichloride	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tetraethyllead	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ethylene Dibromide	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

TABLE C-11. FTP INDIVIDUAL SAMPLE EMISSION RESULTS
Test Series 742 - 12 Percent Misfire and 10° Retard

	Emissions in mg/km											
	Unmodified		Malfunction									
	744-11		742-21		742-31							
	COLD-UDDS	HOT-UDDS	COLD-UDDS	HOT-UDDS	COLD-UDDS	HOT-UDDS						
Total Particulate	91.70	80.84	207.31	169.90	180.98	166.17						
Sulfates	0.15	0.24	0.39	0.90	1.02	1.30						
Ammonia	4.36	3.36	29.86	3.48	25.63	6.53						
Cyanides & Cyanogen	0.88	0.99	0.36	0.62	0.36	0.24						
Hydrogen Sulfide	0.00	0.00	0.00	0.00	0.00	0.00						
<u>Aldehydes & Ketones</u>												
Formaldehyde	27.91	10.67	38.59	125.23	--	--						
Acetaldehyde	1.42	0.31	0.44	3.95	--	--						
Acetone	0.61	0.00	0.33	0.00	--	--						
Isobutyraldehyde	--	--	--	--	--	--						
Methyl ethyl ketone	0.00	0.00	0.00	0.00	--	--						
Hexanaldehyde	0.00	0.00	4.01	0.00	--	--						
<u>Organic Sulfides</u>												
Carbonyl sulfide	0.00	0.00	--	--	0.14	0.00						
Methyl sulfide	0.00	0.00	--	--	0.00	0.00						
Ethyl sulfide	0.00	0.00	--	--	0.00	0.00						
Methyl disulfide	0.00	0.00	--	--	0.00	0.00						
<u>Organic Amines</u>												
Monomethylamine	0.02	0.01	0.00	0.04	0.00	0.00						
Monoethylamine & dimethylamine	0.01	0.00	0.00	0.00	0.00	0.00						
Trimethylamine	0.00	0.00	0.00	0.00	0.00	0.00						
Diethylamine	0.00	0.00	0.00	0.00	0.00	0.00						
Triethylamine	0.00	0.00	0.00	0.00	0.00	0.00						
Emissions in ppm				Emissions in ppm				Emissions in ppm				
COLD-UDDS		HOT-UDDS		COLD-UDDS		HOT-UDDS		COLD-UDDS		HOT-UDDS		
1	2	3	4	1	2	3	4	1	2	3	4	
<u>Individual Hydrocarbons</u>												
Methane	17.00	4.16	6.70	3.25	24.58	4.53	11.60	5.02	27.73	4.57	10.88	3.67
Ethylene	38.60	18.69	30.59	18.51	53.54	28.23	49.82	29.42	57.09	26.59	50.96	27.76
Ethane	3.69	1.69	2.52	1.52	4.54	2.13	4.03	2.14	4.95	2.21	4.03	2.04
Acetylene	18.50	5.40	10.10	4.60	26.80	6.10	14.40	6.60	31.70	7.20	15.10	6.10
Propane	0.42	0.25	0.28	0.21	0.42	0.20	0.40	0.22	0.50	0.30	0.65	0.46
Propylene	19.21	10.23	16.05	10.17	32.30	20.35	33.68	21.00	35.62	20.39	36.78	21.94
Benzene	9.54	4.29	6.86	4.07	23.74	12.57	25.78	19.96	35.97	12.06	27.89	12.64
Toluene	40.52	19.16	30.15	17.48	296.92	184.49	262.59	211.95	440.34	247.08	360.29	251.73
<u>Lead Components</u>												
Tetramethyllead	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ethylene Dichloride	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tetraethyllead	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ethylene Dibromide	0.00	0.00	0.00	0.00	0.04	0.02	0.03	0.04	0.08	0.04	0.07	0.10

TABLE C-12.FTP INDIVIDUAL SAMPLE EMISSION RESULTS
Test Series 743 - Lean Idle

	Emissions in mg/km							
	Unmodified				Malfunction			
	743-11		743-21		743-31			
	COLD-UDDS	HOT-UDDS	COLD-UDDS	HOT-UDDS	COLD-UDDS	HOT-UDDS		
Total Particulate	87.48	77.55	92.42	84.39	97.82	91.55		
Sulfates	0.29	0.34	0.62	0.52	0.48	0.40		
Ammonia	7.86	7.52	2.35	2.58	4.36	4.72		
Cyanides & Cyanogen	1.20	0.90	1.60	2.00	2.20	2.20		
Hydrogen Sulfide	0.00	0.00	0.00	0.00	0.00	0.00		
<u>Aldehydes & Ketones</u>								
Formaldehyde	32.36	8.90	8.46	9.48	3.92	--		
Acetaldehyde	2.82	0.00	0.56	0.41	2.11	3.12		
Acetone	0.44	0.00	0.00	0.15	0.00	0.00		
Isobutyraldehyde	--	--	--	--	--	--		
Methyl ethyl ketone	0.00	0.00	0.00	0.00	0.00	0.00		
Hexanaldehyde	0.00	0.00	0.00	0.00	0.00	0.00		
<u>Organic Sulfides</u>								
Carbonyl sulfide	--	--	--	--	0.17	0.04		
Methyl sulfide	--	--	--	--	0.00	0.00		
Ethyl sulfide	--	--	--	--	0.00	0.00		
Methyl disulfide	--	--	--	--	0.00	0.00		
<u>Organic Amines</u>								
Monomethylamine	0.08	0.06	0.04	0.03	0.04	0.03		
Monoethylamine & dimethylamine	0.00	0.06	0.01	0.00	0.00	0.00		
Trimethylamine	0.00	0.00	0.00	0.00	0.00	0.00		
Diethylamine	0.00	0.00	0.00	0.00	0.00	0.00		
Triethylamine	0.00	0.00	0.00	0.00	0.00	0.00		
	Emissions in ppm				Emissions in ppm			
	COLD-UDDS		HOT-UDDS		COLD-UDDS		HOT-UDDS	
	1	2	3	4	1	2	3	4
<u>Individual Hydrocarbons</u>								
Methane	16.43	3.73	6.90	3.60	14.69	3.20	6.63	3.09
Ethylene	38.69	18.66	32.92	19.10	41.45	23.90	36.86	25.04
Ethane	3.63	1.61	2.87	1.55	3.66	1.65	2.81	1.75
Acetylene	18.50	5.20	10.70	5.00	16.10	3.80	9.50	3.90
Propane	0.34	0.13	0.26	0.19	0.34	0.21	0.32	0.20
Propylene	19.33	10.32	17.83	10.65	21.41	13.64	20.31	14.45
Benzene	11.30	4.38	7.16	3.73	10.42	4.72	8.06	4.33
Toluene	49.83	19.05	32.05	14.88	48.82	26.26	46.61	30.52
<u>Lead Components</u>								
Tetramethyllead	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ethylene Dichloride	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tetraethyllead	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ethylene Dibromide	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

APPENDIX D

COMPUTER PRINTOUTS OF THE REGULATED
EMISSIONS TESTS RESULTS

TABLE D-1. TEST 711 EMISSIONS RESULTS
FTP VEHICLE EMISSIONS RESULTS - UNMODIFIED
PROJECT 11-5830-004

TEST NO. 711-11 RUN
VEHICLE MODEL 70 OLDS. DELTA 88
ENGINE 7.5 L(455. CID) V-8
TRANSMISSION A3

VEHICLE NO.71
DATE 12/13/80
BAG CART NO. 1
DYNO NO. 3
CVS NO. 2

TEST WEIGHT 2041. KG(4500. LBS)
ACTUAL ROAD LOAD 9.5 KW(12.7 HP)
GASOLINE EM-433-F
ODOMETER ***** KM(80141. MILES)

BAROMETER 743.71 MM HG(29.28 IN HG)
RELATIVE HUMIDITY 52. PCT
BAG RESULTS

DRY BULB TEMP. 24.4 DEG C(76.0 DEG F)
ABS. HUMIDITY 10.1 GM/KG

NOX HUMIDITY CORRECTION FACTOR .98

BAG NUMBER DESCRIPTION	1 COLD TRANSIENT	2 STABILIZED	3 HOT TRANSIENT	4 STABILIZED
BLOWER DIF P MM, H2O(IN, H2O)	762.0 (30.0)	774.7 (30.5)	762.0 (30.0)	774.7 (30.5)
BLOWER INLET P MM, H2O(IN, H2O)	762.0 (30.0)	774.7 (30.5)	762.0 (30.0)	774.7 (30.5)
BLOWER INLET TEMP. DEG. C(100. F)	43.3 (110.0)	43.3 (110.0)	43.3 (110.0)	43.3 (110.0)
BLOWER REVOLUTIONS	40613.	69597.	40540.	69568.
TOT FLOW STD. CU. METRES(SCF)	76.4 (2697.)	130.7 (4613.)	76.2 (2692.)	130.6 (4611.)
HC SAMPLE METER/RANGE/PPM	42.0/ 3/ 420.	10.3/ 3/ 103.	19.8/ 3/ 198.	9.3/ 3/ 93.
HC BCKGRD METER/RANGE/PPM	1.4/ 3/ 14.	1.2/ 3/ 12.	1.3/ 3/ 13.	1.2/ 3/ 12.
CO SAMPLE METER/RANGE/PPM	72.7/ 2/ 4002.	86.3/ 11/ 411.	27.5/ 3/ 640.	80.1/ 11/ 363.
CO BCKGRD METER/RANGE/PPM	.1/ 2/ 4.	1.8/ 11/ 5.	.2/ 3/ 5.	1.2/ 11/ 3.
CO2 SAMPLE METER/RANGE/PCT	42.9/ 2/ 1.86	72.5/ 3/ 1.32	89.2/ 3/ 1.66	71.2/ 3/ 1.29
CO2 BCKGRD METER/RANGE/PCT	1.7/ 2/ .06	3.5/ 3/ .05	3.3/ 3/ .05	3.8/ 3/ .06
NOX SAMPLE METER/RANGE/PPM	39.4/ 3/ 118.	43.3/ 2/ 43.	38.9/ 3/ 117.	42.2/ 2/ 42.
NOX BCKGRD METER/RANGE/PPM	.1/ 3/ 0.	.8/ 2/ 1.	.1/ 3/ 0.	.5/ 2/ 1.
DILUTION FACTOR	5.88	9.82	7.69	10.05
HC CONCENTRATION PPM	408.	92.	187.	82.
CO CONCENTRATION PPM	3788.	389.	605.	345.
CO2 CONCENTRATION PCT	1.81	1.27	1.62	1.24
NOX CONCENTRATION PPM	118.0	42.6	116.4	41.7
HC MASS GRAMS	17.99	6.95	8.21	6.19
CO MASS GRAMS	336.89	59.14	53.69	52.44
CO2 MASS GRAMS	2527.3	3030.8	2257.9	2955.7
NOX MASS GRAMS	16.91	10.44	16.66	10.23
HC GRAMS/KM	3.08	1.11	1.43	1.00
CO GRAMS/KM	57.65	9.48	9.35	8.51
CO2 GRAMS/KM	432.5	485.7	393.1	479.7
NOX GRAMS/KM	2.89	1.67	2.90	1.66
FUEL CONSUMPTION BY CB L/100KM	22.74	21.52	17.60	21.18
RUN TIME SECONDS	506.	868.	505.	868.
MEASURED DISTANCE KM	5.84	6.24	5.74	6.16
DFC, WET (DRY)	.873 (.858)		.889 (.874)	
SCF, WET (DRY)	1.000 (.969)		1.000 (.970)	
VOL (SCH)				206.8
SAM BLR (SCH)	0.00			0.00
KM (MEASURED)	12.08			11.91
FUEL CONSUMPTION L/100KM	22.11			19.45

COMPOSITE RESULTS

TEST NUMBER 711-11
BAROMETER MM HG 743.7
HUMIDITY G/KG 10.1
TEMPERATURE DEG C 24.4

CARBON DIOXIDE G/KM 449.3 (447.4)
FUEL CONSUMPTION L/100KM 20.70 (20.60)
HYDROCARBONS (THC) G/KM 1.61 (1.58)
CARBON MONOXIDE G/KM 19.46 (19.17)
OXIDES OF NITROGEN G/KM 2.26 (2.26)

SET VEHICLE EMISSIONS RESULTS - UNMODIFIED
PROJECT 11-5830-004

TEST NO. 711-12 RUN
VEHICLE MODEL 70 OLDS. DELTA 88
ENGINE 7.5 L(455. CID) V-8
TRANSMISSION A3

VEHICLE NO.71
DATE 12/15/80
BAG CART NO. 1
DYNO NO. 3
CVS NO. 2

TEST WEIGHT 2041. KG(4500. LBS)
ACTUAL ROAD LOAD 9.5 KW(12.7 HP)
GASOLINE EM-433-F
ODOMETER ***** KM(80141. MILES)

BAROMETER 743.20 MM HG(29.24 IN HG)
RELATIVE HUMIDITY 49. PCT
BAG RESULTS

DRY BULB TEMP. 25.0 DEG C(77.0 DEG F)
ABS. HUMIDITY 9.9 GM/KG

NOX HUMIDITY CORRECTION FACTOR .97

TEST CYCLE	SET	HFET
BLOWER DIF P MM, H2O(IN, H2O)	774.7 (30.5)	774.7 (30.5)
BLOWER INLET P MM, H2O(IN, H2O)	774.7 (30.5)	774.7 (30.5)
BLOWER INLET TEMP. DEG. C(100. F)	43.3 (110.0)	43.3 (110.0)
BLOWER REVOLUTIONS	111919.	61349.
TOT FLOW STD. CU. METRES(SCF)	209.9 (7413.)	115.0 (4060.)
HC SAMPLE METER/RANGE/PPM	18.0/ 3/ 180.	26.1/ 3/ 261.
HC BCKGRD METER/RANGE/PPM	1.0/ 3/ 10.	1.1/ 3/ 11.
CO SAMPLE METER/RANGE/PPM	27.7/ 3/ 645.	35.1/ 3/ 829.
CO BCKGRD METER/RANGE/PPM	.1/ 3/ 2.	.1/ 3/ 2.
CO2 SAMPLE METER/RANGE/PCT	98.5/ 3/ 1.86	50.1/ 2/ 2.24
CO2 BCKGRD METER/RANGE/PCT	3.3/ 3/ .05	1.3/ 2/ .05
NOX SAMPLE METER/RANGE/PPM	55.5/ 3/ 167.	84.4/ 3/ 253.
NOX BCKGRD METER/RANGE/PPM	.1/ 3/ 0.	.2/ 3/ 1.
DILUTION FACTOR	6.92	5.71
HC CONCENTRATION PPM	171.	252.
CO CONCENTRATION PPM	410.	778.
CO2 CONCENTRATION PCT	1.81	2.21
NOX CONCENTRATION PPM	166.2	252.7
HC MASS GRAMS	20.75	16.70
CO MASS GRAMS	148.99	104.13
CO2 MASS GRAMS	6970.9	4645.7
NOX MASS GRAMS	65.00	54.14
RUN TIME SECONDS	1397.	766.
DFC, WET (DRY)	.856 (.842)	.825 (.812)
SCF, WET (DRY)	1.000 (.967)	1.000 (.963)
VOL (SCH)	209.9	115.0
SAM BLR (SCH)	0.00	0.00
KM (MEASURED)	21.63	16.53
TEST NUMBER,	711-12	711-13
BAROMETER, MM HG	743.2	742.7
HUMIDITY, G/KG	9.9	9.9
TEMPERATURE, DEG C	25.0	25.0
CARBON DIOXIDE, G/KM	322.3	281.0
FUEL CONSUMPTION, L/100KM	14.35	12.55
HYDROCARBONS, G/KM	.96	1.01
CARBON MONOXIDE, G/KM	6.89	6.30
OXIDES OF NITROGEN, G/KM	3.01	3.27

TABLE D-2. TEST 711 EMISSIONS RESULTS

FTP		VEHICLE EMISSIONS RESULTS - RICH BEST IDLE		PROJECT 11-5830-004	
TEST NO. 711-21 RUN		VEHICLE NO. 71		TEST WEIGHT 2041. KG (4500. LBS)	
VEHICLE MODEL 70 OLDS. DELTA 88		DATE 12/14/80		ACTUAL ROAD LOAD 9.5 KW (12.7 HP)	
ENGINE 7.5 L (455. CID) V-8		BAG CART NO. 1		GASOLINE EM-433-F	
TRANSMISSION A3		DYNO NO. 3		ODOMETER ***** KM (80141. MILES)	
CVS NO. 2		DRY BULB TEMP. 26.1 DEG C (79.0 DEG F)		NOX HUMIDITY CORRECTION FACTOR .88	
BAROMETER 743.97 MM HG (29.29 IN HG)		ABS. HUMIDITY 6.7 GM/KG			
RELATIVE HUMIDITY 31. PCT					
BAG RESULTS					
BAG NUMBER					
DESCRIPTION					
		1	2	3	4
		COLD TRANSIENT	STABILIZED	HOT TRANSIENT	STABILIZED
BLOWER DIF P MM. H2O (IN. H2O)		762.0 (30.0)	774.7 (30.5)	762.0 (30.0)	774.7 (30.5)
BLOWER INLET P MM. H2O (IN. H2O)		762.0 (30.0)	774.7 (30.5)	762.0 (30.0)	774.7 (30.5)
BLOWER INLET TEMP. DEG. C (DEG. F)		43.3 (110.0)	43.3 (110.0)	42.8 (109.0)	43.3 (110.0)
BLOWER REVOLUTIONS		40860.	69540.	40544.	69567.
TOT FLOW STD. CU. METRES (SCF)		76.5 (2701.)	130.6 (4612.)	76.4 (2696.)	130.6 (4613.)
HC SAMPLE METER/RANGE/PPM		40.6/ 3/ 406.	15.4/ 3/ 154.	19.7/ 3/ 197.	14.4/ 3/ 144.
HC BCKGRD METER/RANGE/PPM		1.1/ 3/ 11.	1.2/ 3/ 12.	1.2/ 3/ 12.	1.3/ 3/ 13.
CO SAMPLE METER/RANGE/PPM		76.1/ 2/ 4281.	64.9/ 3/ 1660.	54.6/ 3/ 1353.	58.3/ 3/ 1460.
CO BCKGRD METER/RANGE/PPM		1.1/ 2/ 4.	1.5/ 3/ 11.	1.4/ 3/ 9.	1.5/ 3/ 11.
CO2 SAMPLE METER/RANGE/PCT		94.7/ 3/ 1.77	67.0/ 3/ 1.20	84.9/ 3/ 1.57	67.8/ 3/ 1.22
CO2 BCKGRD METER/RANGE/PCT		3.0/ 3/ .05	3.4/ 3/ .05	3.8/ 3/ .06	3.9/ 3/ .06
NOX SAMPLE METER/RANGE/PPM		41.8/ 3/ 125.	44.1/ 2/ 44.	44.1/ 3/ 132.	45.2/ 2/ 45.
NOX BCKGRD METER/RANGE/PPM		1.1/ 3/ 0.	1.2/ 2/ 1.	1.1/ 3/ 0.	1.2/ 2/ 1.
DILUTION FACTOR		6.02	9.72	7.79	9.75
HC CONCENTRATION PPM		397.	143.	187.	132.
CO CONCENTRATION PPM		4088.	1595.	1290.	1401.
CO2 CONCENTRATION PCT		1.74	1.16	1.52	1.17
NOX CONCENTRATION PPM		125.1	43.0	132.0	44.7
HC MASS GRAMS		17.51	10.79	8.21	9.97
CO MASS GRAMS		31.13	242.45	114.70	213.11
CO2 MASS GRAMS		2432.3	2765.5	2126.0	2788.5
NOX MASS GRAMS		16.19	9.50	17.05	9.87
HC GRAMS/KM		3.01	1.74	1.42	1.61
CO GRAMS/KM		62.53	39.12	19.72	34.46
CO2 GRAMS/KM		417.7	448.3	366.7	450.9
NOX GRAMS/KM		2.78	1.53	2.94	1.60
FUEL CONSUMPTION BY CB L/100KM		22.43	21.91	17.17	21.77
RUN TIME SECONDS		506.	866.	505.	867.
MEASURED DISTANCE KM		5.82	6.20	5.80	6.18
DFC, WET (DRY)		.874 (.865)		.888 (.879)	
SCF, WET (DRY)		1.000 (.977)		1.000 (.977)	
VOL (SCM)		207.1		207.0	
SAM BLR (SCM)		0.00		0.00	
KN (MEASURED)		12.02		11.98	
FUEL CONSUMPTION L/100KM		22.16		19.55	
COMPOSITE RESULTS				3-BAG	(4-BAG)
TEST NUMBER 711-21				CARBON DIOXIDE G/KM	418.4 (419.7)
BAROMETER MM HG 744.0				FUEL CONSUMPTION L/100KM	20.71 (20.67)
HUMIDITY G/KG 6.7				HYDROCARBONS (THC) G/KM	1.91 (1.88)
TEMPERATURE DEG C 26.1				CARBON MONOXIDE G/KM	38.67 (37.29)
				OXIDES OF NITROGEN G/KM	2.18 (2.20)

SET VEHICLE EMISSIONS RESULTS - RICH BEST IDLE
PROJECT 11-5830-004

TEST NO. 711-22 RUN		VEHICLE NO. 71		TEST WEIGHT 2041. KG (4500. LBS)	
VEHICLE MODEL 70 OLDS. DELTA 88		DATE 12/16/80		ACTUAL ROAD LOAD 9.5 KW (12.7 HP)	
ENGINE 7.5 L (455. CID) V-8		BAG CART NO. 1		GASOLINE EM-433-F	
TRANSMISSION A3		DYNO NO. 3		ODOMETER ***** KM (80141. MILES)	
CVS NO. 2		DRY BULB TEMP. 28.3 DEG C (83.0 DEG F)		NOX HUMIDITY CORRECTION FACTOR .86	
BAROMETER 743.46 MM HG (29.27 IN HG)		ABS. HUMIDITY 5.8 GM/KG			
RELATIVE HUMIDITY 24. PCT					
BAG RESULTS					
TEST CYCLE		SET	HFET		
BLOWER DIF P MM. H2O (IN. H2O)		774.7 (30.5)	787.4 (31.0)		
BLOWER INLET P MM. H2O (IN. H2O)		774.7 (30.5)	787.4 (31.0)		
BLOWER INLET TEMP. DEG. C (DEG. F)		43.3 (110.0)	43.3 (110.0)		
BLOWER REVOLUTIONS		111874.	61372.		
TOT FLOW STD. CU. METRES (SCF)		209.9 (7413.)	115.0 (4059.)		
HC SAMPLE METER/RANGE/PPM		19.0/ 3/ 190.	23.4/ 3/ 234.		
HC BCKGRD METER/RANGE/PPM		1.0/ 3/ 10.	1.0/ 3/ 10.		
CO SAMPLE METER/RANGE/PPM		50.7/ 3/ 1243.	40.7/ 3/ 973.		
CO BCKGRD METER/RANGE/PPM		1.1/ 3/ 2.	1.1/ 3/ 2.		
CO2 SAMPLE METER/RANGE/PCT		95.6/ 3/ 1.80	49.2/ 2/ 2.20		
CO2 BCKGRD METER/RANGE/PCT		2.7/ 3/ .04	1.3/ 2/ .05		
NOX SAMPLE METER/RANGE/PPM		62.5/ 3/ 188.	93.7/ 3/ 281.		
NOX BCKGRD METER/RANGE/PPM		1.2/ 3/ 1.	1.3/ 3/ 1.		
DILUTION FACTOR		6.93	5.80		
HC CONCENTRATION PPM		181.	226.		
CO CONCENTRATION PPM		1188.	923.		
CO2 CONCENTRATION PCT		1.76	2.16		
NOX CONCENTRATION PPM		187.0	280.4		
HC MASS GRAMS		21.96	14.96		
CO MASS GRAMS		290.37	123.49		
CO2 MASS GRAMS		6766.6	4540.9		
NOX MASS GRAMS		64.62	52.70		
RUN TIME SECONDS		1396.	766.		
DFC, WET (DRY)		.856 (.849)	.828 (.822)		
SCF, WET (DRY)		1.000 (.976)	1.000 (.973)		
VOL (SCM)		209.9	115.0		
SAM BLR (SCM)		0.00	0.00		
KN (MEASURED)		21.59	16.37		
TEST NUMBER, 711-22				711-23	
BAROMETER, MM HG 743.5				743.5	
HUMIDITY, G/KG 5.8				5.6	
TEMPERATURE, DEG C 28.3				28.9	
CARBON DIOXIDE, G/KM 313.4				277.4	
FUEL CONSUMPTION, L/100KM 14.41				12.47	
HYDROCARBONS, G/KM 1.02				.91	
CARBON MONOXIDE, G/KM 13.45				7.54	
OXIDES OF NITROGEN, G/KM 2.99				3.22	

TABLE D-3. TEST 711 EMISSIONS RESULTS

FTP VEHICLE EMISSIONS RESULTS - RICH BEST IDLE
PROJECT 11-5830-004TEST NO. 711-31 RUN 1
VEHICLE MODEL 70 OLDS. DELTA 88
ENGINE 7.5 L(455. CID) V-8
TRANSMISSION A3VEHICLE NO. 71
DATE 12/17/80
BAG CART NO. 1
DYNO NO. 3
CVS NO. 2TEST WEIGHT 2041. KG (4500. LBS)
ACTUAL ROAD LOAD 9.5 KW (12.7 HP)
GASOLINE EM-433-F
ODOMETER ***** KM (80141. MILES)BAROMETER 746.00 MM HG(29.37 IN HG)
RELATIVE HUMIDITY 34. PCT
BAG RESULTSDRY BULB TEMP. 25.6 DEG C(78.0 DEG F)
ABS. HUMIDITY 6.9 GM/KG

NOX HUMIDITY CORRECTION FACTOR .89

BAG NUMBER DESCRIPTION	1 COLD TRANSIENT	2 STABILIZED	3 HOT TRANSIENT	4 STABILIZED
BLOWER DIF P MM. H2O(IN. H2O)	767.1 (30.2)	767.1 (30.2)	762.0 (30.0)	769.6 (30.3)
BLOWER INLET P MM. H2O(IN. H2O)	762.0 (30.0)	762.0 (30.0)	756.9 (29.8)	762.0 (30.0)
BLOWER INLET TEMP. DEG. C(DEG. F)	44.4 (112.0)	43.9 (111.0)	43.9 (111.0)	43.9 (111.0)
BLOWER REVOLUTIONS	40598.	69634.	40560.	69500.
TOT FLOW STD. CU. METRES(SCF)	76.5 (2700.)	131.3 (4635.)	76.5 (2702.)	131.0 (4625.)
HC SAMPLE METER/RANGE/PPM	39.8/ 3/ 399.	16.4/ 3/ 164.	20.4/ 3/ 204.	15.4/ 3/ 154.
HC BCKGRD METER/RANGE/PPM	1.1/ 3/ 11.	1.2/ 3/ 12.	1.4/ 3/ 14.	1.4/ 3/ 14.
CO SAMPLE METER/RANGE/PPM	76.0/ 2/ 4273.	69.6/ 3/ 1809.	59.3/ 3/ 1490.	64.7/ 3/ 1654.
CO BCKGRD METER/RANGE/PPM	.1/ 2/ 4.	.1/ 3/ 2.	.1/ 3/ 2.	.1/ 3/ 2.
CO2 SAMPLE METER/RANGE/PCT	92.2/ 3/ 1.72	65.9/ 3/ 1.18	85.6/ 3/ 1.59	65.6/ 3/ 1.18
CO2 BCKGRD METER/RANGE/PCT	3.0/ 3/ .05	3.0/ 3/ .05	3.0/ 3/ .05	3.0/ 3/ .05
NOX SAMPLE METER/RANGE/PPM	39.2/ 3/ 118.	43.7/ 2/ 44.	44.8/ 3/ 134.	44.7/ 2/ 45.
NOX BCKGRD METER/RANGE/PPM	.3/ 3/ 1.	.8/ 2/ 1.	.3/ 3/ 1.	.8/ 2/ 1.
DILUTION FACTOR	6.17	9.76	7.66	9.92
HC CONCENTRATION PPM	389.	153.	192.	141.
CO CONCENTRATION PPM	4082.	1746.	1426.	1596.
CO2 CONCENTRATION PCT	1.69	1.14	1.55	1.13
NOX CONCENTRATION PPM	116.8	43.0	133.6	44.0
HC MASS GRAMS	17.14	11.60	8.46	10.68
CO MASS GRAMS	363.30	266.80	127.04	243.44
CO2 MASS GRAMS	2360.0	2739.3	2166.0	2719.0
NOX MASS GRAMS	15.20	9.60	17.39	9.80
HC GRAMS/KM	2.97	1.87	1.46	1.72
CO GRAMS/KM	62.87	43.00	21.97	39.11
CO2 GRAMS/KM	408.4	441.5	374.6	436.8
NOX GRAMS/KM	2.63	1.55	3.01	1.57
FUEL CONSUMPTION BY CB L/100KM	22.05	21.98	17.66	21.50
RUN TIME SECONDS				
MEASURED DISTANCE KM	5.78	6.21	5.78	6.22
DFC, WET (DRY)		.876 (.866)		.888 (.879)
SCF, WET (DRY)		1.000 (.976)		1.000 (.977)
VOL (SCM)		207.7		207.5
SAM BLR (SCM)		0.00		0.00
KM (MEASURED)		11.98		12.01
FUEL CONSUMPTION L/100KM		22.01		19.65

COMPOSITE RESULTS

TEST NUMBER 711-31
BAROMETER MM HG 746.0
HUMIDITY G/KG 6.9
TEMPERATURE DEG C 25.6CARBON DIOXIDE G/KM 3-BAG (4-BAG)
FUEL CONSUMPTION L/100KM 416.2 (414.9)
HYDROCARBONS (THC) G/KM 20.81 (20.67)
CARBON MONOXIDE G/KM 1.99 (1.94)
OXIDES OF NITROGEN G/KM 41.34 (40.20)
2.17 (2.18)SET VEHICLE EMISSIONS RESULTS - RICH BEST IDLE
PROJECT 11-5830-004TEST NO. 711-32 RUN 1
VEHICLE MODEL 70 OLDS. DELTA 88
ENGINE 7.5 L(455. CID) V-8
TRANSMISSION A3VEHICLE NO. 71
DATE 12/17/80
BAG CART NO. 1
DYNO NO. 3
CVS NO. 2TEST WEIGHT 2041. KG (4500. LBS)
ACTUAL ROAD LOAD 9.5 KW (12.7 HP)
GASOLINE EM-433-F
ODOMETER ***** KM(***** MILES)BAROMETER 745.49 MM HG(29.35 IN HG)
RELATIVE HUMIDITY 35. PCT
BAG RESULTSDRY BULB TEMP. 24.4 DEG C(76.0 DEG F)
ABS. HUMIDITY 6.8 GM/KG

NOX HUMIDITY CORRECTION FACTOR .89

TEST CYCLE	SET	HFET
BLOWER DIF P MM. H2O(IN. H2O)	762.0 (30.0)	787.4 (31.0)
BLOWER INLET P MM. H2O(IN. H2O)	756.9 (29.8)	774.7 (30.5)
BLOWER INLET TEMP. DEG. C(DEG. F)	43.3 (110.0)	43.9 (111.0)
BLOWER REVOLUTIONS	111918.	61326.
TOT FLOW STD. CU. METRES(SCF)	211.2 (7456.)	115.2 (4068.)
HC SAMPLE METER/RANGE/PPM	20.5/ 3/ 205.	25.1/ 3/ 251.
HC BCKGRD METER/RANGE/PPM	1.5/ 3/ 15.	1.5/ 3/ 15.
CO SAMPLE METER/RANGE/PPM	55.8/ 3/ 1397.	44.6/ 3/ 1076.
CO BCKGRD METER/RANGE/PPM	.1/ 3/ 2.	.1/ 3/ 2.
CO2 SAMPLE METER/RANGE/PCT	94.2/ 3/ 1.77	48.4/ 2/ 2.15
CO2 BCKGRD METER/RANGE/PCT	3.6/ 3/ .06	1.5/ 2/ .05
NOX SAMPLE METER/RANGE/PPM	59.4/ 3/ 178.	86.2/ 3/ 259.
NOX BCKGRD METER/RANGE/PPM	.3/ 3/ 1.	.4/ 3/ 1.
DILUTION FACTOR	6.98	5.88
HC CONCENTRATION PPM	192.	239.
CO CONCENTRATION PPM	1323.	1011.
CO2 CONCENTRATION PCT	1.72	2.11
NOX CONCENTRATION PPM	177.4	257.6
HC MASS GRAMS	21.39	15.85
CO MASS GRAMS	325.10	135.56
CO2 MASS GRAMS	6645.8	4447.4
NOX MASS GRAMS	63.47	59.39
RUN TIME SECONDS	1397.	766.
DFC, WET (DRY)	.857 (.847)	.810 (.815)
SCF, WET (DRY)	1.000 (.972)	1.000 (.963)
VOL (SCM)	211.2	115.2
SAM BLR (SCM)	0.00	0.00
KM (MEASURED)	21.55	16.31
TEST NUMBER,	711-32	711-33
BAROMETER, MM HG	745.5	745.2
HUMIDITY, G/KG	6.8	12.1
TEMPERATURE, DEG C	24.4	26.7
CARBON DIOXIDE, G/KM	308.4	272.6
FUEL CONSUMPTION, L/100KM	14.32	12.33
HYDROCARBONS, G/KM	1.09	.97
CARBON MONOXIDE, G/KM	15.09	8.31
OXIDES OF NITROGEN, G/KM	2.95	3.64

TABLE D-4. TEST 712 EMISSIONS RESULTS

FTP VEHICLE EMISSIONS RESULTS - UNMODIFIED		PROJECT 11-5830-004		
TEST NO. 712-11 RUN 1	VEHICLE NO. 71	TEST WEIGHT 2041. KG (4500. LBS)		
VEHICLE MODEL 70 OLDS DELTA 88	DATE 12/10/80	ACTUAL ROAD LOAD 9.5 KW (12.7 HP)		
ENGINE 7.5 L (455. CID) V-8	BAG CART NO. 1	GASOLINE EM-433-F		
TRANSMISSION A3	DYNO NO. 3	ODOMETER ***** KM (80141. MILES)		
	CVS NO. 2			
BAROMETER 753.62 MM HG (29.47 IN HG)	DRY BULB TEMP. 23.3 DEG C (74.0 DEG F)	NOX HUMIDITY CORRECTION FACTOR .84		
RELATIVE HUMIDITY 27. PCT	ABS. HUMIDITY 4.8 GR/KG			
BAG RESULTS				
BAG NUMBER				
DESCRIPTION				
	1 COLD TRANSIENT	2 STABILIZED	3 HOT TRANSIENT	
			4 STABILIZED	
BLOWER DIF P MM. H2O (IN. H2O)	762.0 (30.0)	774.7 (30.5)	762.0 (30.0)	774.7 (30.5)
BLOWER INLET P MM. H2O (IN. H2O)	762.0 (30.0)	774.7 (30.5)	762.0 (30.0)	774.7 (30.5)
BLOWER INLET TEMP. DEG. C (DEG. F)	43.3 (110.0)	42.8 (109.0)	43.1 (109.5)	42.8 (109.0)
BLOWER REVOLUTIONS	40490	69389	40464	69353
TOT FLOW STD. CU. METRES (SCF)	77.3 (2728.)	132.7 (4685.)	77.3 (2728.)	132.6 (4681.)
HC SAMPLE METER/RANGE/PPM	28.1/ 3/ 281.	80.8/ 2/ 81.	17.3/ 3/ 173.	77.5/ 2/ 78.
HC BCKGRD METER/RANGE/PPM	9/ 3/ 9.	9/ 0/ 2/ 9.	9/ 3/ 9.	9.5/ 2/ 10.
CO SAMPLE METER/RANGE/PPM	65.3/ 2/ 3430.	66.0/ 11/ 270.	90.0/ 11/ 442.	65.5/ 11/ 267.
CO BCKGRD METER/RANGE/PPM	1.1/ 2/ 4.	1.2/ 11/ 3.	1.2/ 11/ 2.	1.6/ 11/ 2.
CO2 SAMPLE METER/RANGE/PCT	42.1/ 2/ 1.82	72.0/ 3/ 1.30	89.5/ 3/ 1.87	70.3/ 3/ 1.27
CO2 BCKGRD METER/RANGE/PCT	1.2/ 2/ .04	3.2/ 3/ .05	3.2/ 3/ .05	3.0/ 3/ .05
NOX SAMPLE METER/RANGE/PPM	41.5/ 3/ 125.	48.2/ 2/ 48.	45.3/ 3/ 135.	47.9/ 2/ 48.
NOX BCKGRD METER/RANGE/PPM	.1/ 3/ 0.	.5/ 2/ 1.	.2/ 3/ 1.	.5/ 2/ 1.
DILUTION FACTOR	6.15	10.01	7.76	10.28
HC CONCENTRATION PPM	273.	73.	155.	89.
CO CONCENTRATION PPM	3277.	258.	422.	257.
CO2 CONCENTRATION PCT	1.79	1.26	1.63	1.23
NOX CONCENTRATION PPM	124.2	47.7	135.4	47.4
HC MASS GRAMS	12.18	5.56	7.36	5.27
CO MASS GRAMS	294.77	39.88	37.94	39.67
CO2 MASS GRAMS	2526.1	3063.1	2298.6	2982.9
NOX MASS GRAMS	15.36	10.14	16.73	10.06
HC GRAMS/KM	2.11	.90	1.28	.85
CO GRAMS/KM	50.94	8.43	6.61	8.39
CO2 GRAMS/KM	436.6	493.6	400.3	480.1
NOX GRAMS/KM	2.85	1.63	2.91	1.62
FUEL CONSUMPTION BY CB L/100KM	22.34	21.62	17.70	21.03
RUN TIME SECONDS	504.	868.	505.	868.
MEASURED DISTANCE KM	5.79	8.21	5.74	8.21
DFC, WET (DRY)		.877 (.869)		.891 (.883)
SCF, WET (DRY)		1.000 (.978)		1.000 (.978)
VOL (SCM)		210.0		209.8
SAM BLR (SCM)		0.00		0.00
KM (MEASURED)		11.99		11.96
FUEL CONSUMPTION L/100KM		21.97		19.43
COMPOSITE RESULTS				
TEST NUMBER 712-11				
BAROMETER MM HG 753.6				
HUMIDITY G/KG 4.8				
TEMPERATURE DEG C 23.3				
			3-BAG	(4-BAG)
			456.2	(452.2)
			20.70	(20.32)
			G/KM 1.25	(1.24)
			G/KM 15.71	(15.70)
			G/KM 2.20	(2.19)

SET VEHICLE EMISSIONS RESULTS - UNMODIFIED
PROJECT 11-5830-004

TEST NO. 712-12 RUN 1	VEHICLE NO. 71	TEST WEIGHT 2041. KG (4500. LBS)	
VEHICLE MODEL 70 OLDS DELTA A 88	DATE 12/10/80	ACTUAL ROAD LOAD 9.5 KW (12.7 HP)	
ENGINE 7.5 L (455. CID) V-8	BAG CART NO. 1	GASOLINE EM-433-F	
TRANSMISSION A3	DYNO NO. 3	ODOMETER ***** KM (80141. MILES)	
	CVS NO. 2		
BAROMETER 753.36 MM HG (29.46 IN HG)	DRY BULB TEMP. 23.9 DEG C (75.0 DEG F)	NOX HUMIDITY CORRECTION FACTOR .83	
RELATIVE HUMIDITY 25. PCT	ABS. HUMIDITY 4.5 GR/KG		
BAG RESULTS			
TEST CYCLE	SET	HFET	
BLOWER DIF P MM. H2O (IN. H2O)	774.7 (30.5)	774.7 (30.5)	
BLOWER INLET P MM. H2O (IN. H2O)	774.7 (30.5)	774.7 (30.5)	
BLOWER INLET TEMP. DEG. C (DEG. F)	43.3 (110.0)	43.1 (109.5)	
BLOWER REVOLUTIONS	111989	61381	
TOT FLOW STD. CU. METRES (SCF)	213.2 (7529.)	116.9 (4127.)	
HC SAMPLE METER/RANGE/PPM	15.9/ 3/ 159.	22.4/ 3/ 224.	
HC BCKGRD METER/RANGE/PPM	1.0/ 3/ 10.	1.1/ 3/ 11.	
CO SAMPLE METER/RANGE/PPM	89.6/ 11/ 438.	24.0/ 3/ 555.	
CO BCKGRD METER/RANGE/PPM	.7/ 11/ 2.	.1/ 3/ 2.	
CO2 SAMPLE METER/RANGE/PCT	96.0/ 3/ 1.80	48.9/ 2/ 2.18	
CO2 BCKGRD METER/RANGE/PCT	3.1/ 3/ .05	1.3/ 2/ .05	
NOX SAMPLE METER/RANGE/PPM	62.3/ 3/ 187.	91.3/ 3/ 274.	
NOX BCKGRD METER/RANGE/PPM	.1/ 3/ 0.	.4/ 3/ 1.	
DILUTION FACTOR	7.20	5.94	
HC CONCENTRATION PPM	150.	215.	
CO CONCENTRATION PPM	418.	527.	
CO2 CONCENTRATION PCT	1.76	2.14	
NOX CONCENTRATION PPM	186.6	272.9	
HC MASS GRAMS	18.49	14.48	
CO MASS GRAMS	103.70	71.65	
CO2 MASS GRAMS	6884.4	4582.1	
NOX MASS GRAMS	63.26	50.21	
RUN TIME SECONDS	1398.	766.	
DFC, WET (DRY)	.861 (.854)	.832 (.826)	
SCF, WET (DRY)	1.000 (.975)	1.000 (.973)	
VOL (SCH)	213.2	116.9	
SAM BLR (SCH)	0.00	0.00	
KM (MEASURED)	21.46	16.26	
TEST NUMBER, 712-12		712-13	
BAROMETER, MM HG 753.4		753.1	
HUMIDITY, G/KG 4.5		4.2	
TEMPERATURE, DEG C 23.9		26.1	
CARBON DIOXIDE, G/KM 320.8		281.9	
FUEL CONSUMPTION, L/100KM 14.13		12.45	
HYDROCARBONS, G/KM .86		.89	
CARBON MONOXIDE, G/KM 4.83		4.41	
OXIDES OF NITROGEN, G/KM 2.95		3.09	

TABLE D-5. TEST 712 EMISSIONS RESULTS
FTP VEHICLE EMISSIONS RESULTS - 12 PERCENT MISFIRE
PROJECT 11-5830-004

TEST NO. 712-21 RUN
VEHICLE MODEL 70 OLDS.DELTA88
ENGINE 7.5 L(455. CID) V-8
TRANSMISSION A3

VEHICLE NO.71
DATE 12/11/80
BAG CART NO. 1
DYNO NO. 3
CVS NO. 2

TEST WEIGHT 2041. KG(4500. LBS)
ACTUAL ROAD LOAD 9.5 KW(12.7 HP)
GASOLINE EM-433-F
ODOMETER ***** KM(80141. MILES)

BAROMETER 749.81 MM HG(29.52 IN HG)
RELATIVE HUMIDITY 23. PCT
BAG RESULTS

DRY BULB TEMP. 26.1 DEG C(79.0 DEG F)
ABS. HUMIDITY 4.8 GM/KG
NOX HUMIDITY CORRECTION FACTOR .84

BAG NUMBER
DESCRIPTION
BLOWER DIF P MM. H2O(IN. H2O)
BLOWER INLET P MM. H2O(IN. H2O)
BLOWER INLET TEMP. DEG. C(DEG. F)
BLOWER REVOLUTIONS
TOT FLOW STD. CU. METRES(SCF)
HC SAMPLE METER/RANGE/PPM
HC BCKGRD METER/RANGE/PPM
CO SAMPLE METER/RANGE/PPM
CO BCKGRD METER/RANGE/PPM
CO2 SAMPLE METER/RANGE/PCT
CO2 BCKGRD METER/RANGE/PCT
NOX SAMPLE METER/RANGE/PPM
NOX BCKGRD METER/RANGE/PPM
DILUTION FACTOR
HC CONCENTRATION PPM
CO CONCENTRATION PPM
CO2 CONCENTRATION PCT
NOX CONCENTRATION PPM
HC MASS GRAMS
CO MASS GRAMS
CO2 MASS GRAMS
NOX MASS GRAMS
HC GRAMS/KM
CO GRAMS/KM
CO2 GRAMS/KM
NOX GRAMS/KM
FUEL CONSUMPTION BY CB L/100KM
RUN TIME SECONDS
MEASURED DISTANCE KM
DIF. WET (DRY)
SCF. WET (DRY)
VOL (SCM)
SAM BLR (SCM)
KM (MEASURED)
FUEL CONSUMPTION L/100KM

1 COLD TRANSIENT	2 STABILIZED	3 HOT TRANSIENT	4 STABILIZED
742.0 (30.0)	774.7 (30.5)	742.0 (30.0)	774.7 (30.5)
742.0 (30.0)	774.7 (30.5)	742.0 (30.0)	774.7 (30.5)
43.9 (111.0)	43.3 (110.0)	43.3 (110.0)	43.3 (110.0)
40435.	69634.	40537.	69368.
76.7 (2707.)	131.9 (4658.)	76.9 (2716.)	131.8 (4653.)
23.9/ 4/2370.	12.6/ 4/1260.	17.8/ 4/1780.	12.3/ 4/1230.
1.7/ 4/ 10.	2.4/ 4/ 20.	2.4/ 4/ 20.	3.4/ 4/ 30.
63.9/ 2/3327.	79.6/11/ 359.	91.4/11/ 434.	70.8/11/ 300.
3/ 2/ 11.	2.7/11/ 8.	1.7/11/ 5.	1.6/11/ 5.
93.8/ 3/ 1.76	68.5/ 3/ 1.23	86.7/ 3/ 1.41	67.0/ 3/ 1.20
3.8/ 3/ .06	4.0/ 3/ .06	4.3/ 3/ .07	4.2/ 3/ .06
46.6/ 3/ 140.	63.1/ 2/ 63.	53.2/ 3/ 160.	60.3/ 2/ 60.
2/ 3/ 1.	1.0/ 2/ 1.	.4/ 3/ 1.	1.3/ 2/ 1.
5.79	9.61	7.32	9.89
2382.	1242.	1763.	1203.
3181.	341.	432.	287.
1.71	1.18	1.55	1.15
139.3	62.2	158.6	59.1
105.29	94.47	78.19	91.41
283.88	52.41	38.70	43.96
2399.9	2846.5	2186.1	2763.3
17.10	13.14	19.53	12.48
18.22	15.13	13.63	14.94
49.14	8.39	6.75	7.18
415.4	455.7	381.0	451.6
2.96	2.10	3.40	2.04
23.49	22.06	18.56	21.78
504.	868.	505.	868.
5.78	6.25	5.74	6.12
.871 (.864)		.886 (.879)	
1.000 (.979)		1.000 (.980)	
208.6		208.7	
12.02		0.00	
22.75		11.86	
		20.22	

COMPOSITE RESULTS

TEST NUMBER 721-21
BAROMETER MM HG 749.8
HUMIDITY G/KG 4.8
TEMPERATURE DEG C 24.1

CARBON DIOXIDE G/KM 3-BAG (4-BAG)
FUEL CONSUMPTION L/100KM 21.40 (21.31)
HYDROCARBONS (THC) G/KM 15.36 (15.30)
CARBON MONOXIDE G/KM 16.36 (16.00)
OXIDES OF NITROGEN G/KM 2.64 (2.62)

SET VEHICLE EMISSIONS RESULTS - 12 PERCENT MISFIRE
PROJECT 11-5830-004

TEST NO. 712-22 RUN
VEHICLE MODEL 70 OLDS.DELTA88
ENGINE 7.5 L(455. CID) V-8
TRANSMISSION A3

VEHICLE NO.71
DATE 12/11/80
BAG CART NO. 1
DYNO NO. 3
CVS NO. 2

TEST WEIGHT 2041. KG(4500. LBS)
ACTUAL ROAD LOAD 9.5 KW(12.7 HP)
GASOLINE EM-433-F
ODOMETER ***** KM(80141. MILES)

BAROMETER 751.33 MM HG(29.58 IN HG)
RELATIVE HUMIDITY 24. PCT
BAG RESULTS
TEST CYCLE

DRY BULB TEMP. 26.7 DEG C(80.0 DEG F)
ABS. HUMIDITY 5.2 GM/KG
NOX HUMIDITY CORRECTION FACTOR .85

BLOWER DIF P MM. H2O(IN. H2O)
BLOWER INLET P MM. H2O(IN. H2O)
BLOWER INLET TEMP. DEG. C(DEG. F)
BLOWER REVOLUTIONS
TOT FLOW STD. CU. METRES(SCF)
HC SAMPLE METER/RANGE/PPM
HC BCKGRD METER/RANGE/PPM
CO SAMPLE METER/RANGE/PPM
CO BCKGRD METER/RANGE/PPM
CO2 SAMPLE METER/RANGE/PCT
CO2 BCKGRD METER/RANGE/PCT
NOX SAMPLE METER/RANGE/PPM
NOX BCKGRD METER/RANGE/PPM
DILUTION FACTOR
HC CONCENTRATION PPM
CO CONCENTRATION PPM
CO2 CONCENTRATION PCT
NOX CONCENTRATION PPM
HC MASS GRAMS
CO MASS GRAMS
CO2 MASS GRAMS
NOX MASS GRAMS
RUN TIME SECONDS
DIF. WET (DRY)
SCF. WET (DRY)
VOL (SCM)
SAM BLR (SCM)
KM (MEASURED)

SET	HFET
774.7 (30.5)	774.7 (30.5)
774.7 (30.5)	774.7 (30.5)
43.1 (109.5)	43.3 (110.0)
111894.	61333.
212.5 (7504.)	116.3 (4105.)
18.9/ 4/1890.	23.5/ 4/2350.
3/ 4/ 30.	2/ 4/ 20.
94.6/11/ 483.	23.5/ 3/ 543.
1.1/11/ 3.	1/ 3/ 2.
93.8/ 3/ 1.76	48.7/ 2/ 2.17
3.6/ 3/ .06	1.4/ 2/ .05
76.0/ 3/ 228.	32.4/ 4/ 324.
.4/ 3/ 1.	1/ 4/ 1.
6.72	5.46
1864.	2334.
460.	514.
1.71	2.13
227.0	323.2
228.48	156.45
113.85	49.62
4657.6	4529.9
77.98	60.55
1397.	766.
.851 (.845)	.817 (.810)
1.000 (.976)	1.000 (.972)
212.5	116.3
0.00	0.00
21.55	16.30

TEST NUMBER, 712-22
BAROMETER, MM HG 751.3
HUMIDITY, G/KG 5.2
TEMPERATURE, DEG C 26.7
CARBON DIOXIDE, G/KM 309.0
FUEL CONSUMPTION, L/100KM 14.98
HYDROCARBONS, G/KM 10.60
CARBON MONOXIDE, G/KM 5.28
OXIDES OF NITROGEN, G/KM 3.62

712-23
750.3
5.0
25.6
277.9
13.45
9.60
4.27
3.71

TABLE D-6. TEST 712 EMISSIONS RESULTS

FTP VEHICLE EMISSIONS RESULTS - 12 PERCENT MISFIRE PROJECT 11-5830-004		TEST WEIGHT 2041. KG (4500. LBS) ACTUAL ROAD LOAD 9.5 KW (12.7 HP) GASOLINE EM-433-F ODOMETER ***** KM(80142. MILES)	
TEST NO. 712-41 RUN 1 VEHICLE MODEL 70 OLDS DELTA88 ENGINE 7.5 L(455. CID) V-8 TRANSMISSION A3	VEHICLE NO.71 DATE 12/20/80 BAG CART NO. 1 DYN NO. 3 CVS NO. 2	TEST WEIGHT 2041. KG (4500. LBS) ACTUAL ROAD LOAD 9.5 KW (12.7 HP) GASOLINE EM-433-F ODOMETER ***** KM(80142. MILES)	
BAROMETER 757.43 MM HG(29.82 IN HG) RELATIVE HUMIDITY 22. PCT	DRY BULB TEMP. 24.4 DEG C(76.0 DEG F) ABS. HUMIDITY 4.3 GM/KG	NOX HUMIDITY CORRECTION FACTOR .82	
BAG RESULTS			
DESCRIPTION	1 COLD TRANSIENT	2 STABILIZED	3 HOT TRANSIENT
BLOWER DIF P MM. H2O(IN. H2O)	774.7 (30.5)	774.7 (30.5)	742.0 (30.0)
BLOWER INLET P MM. H2O(IN. H2O)	762.0 (30.0)	762.0 (30.0)	749.3 (29.5)
BLOWER INLET TEMP. DEG. C(DEG. F)	43.3 (110.0)	43.3 (110.0)	42.8 (109.0)
BLOWER REVOLUTIONS	40434.	49473.	40300.
TOT FLOW STD. CU. METRES(SCF)	77.9 (2752.)	133.3 (4705.)	77.9 (2751.)
HC SAMPLE METER/RANGE/PPM	24.2/ 4/2420.	13.2/ 4/1320.	17.4/ 4/1740.
HC BCKGRD METER/RANGE/PPM	.1/ 4/ 10.	.2/ 4/ 20.	.1/ 4/ 10.
CO SAMPLE METER/RANGE/PPM	58.3/ 2/2953.	84.3/11/ 396.	93.4/11/ 472.
CO BCKGRD METER/RANGE/PPM	.1/ 2/ 4.	.1/11/ 0.	.1/11/ 0.
CO2 SAMPLE METER/RANGE/PCT	43.4/ 2/ 1.89	70.4/ 3/ 1.27	89.7/ 3/ 1.87
CO2 BCKGRD METER/RANGE/PCT	1.5/ 2/ .05	3.2/ 3/ .05	3.1/ 3/ .05
NOX SAMPLE METER/RANGE/PPM	53.0/ 3/ 159.	74.8/ 2/ 75.	57.7/ 3/ 173.
NOX BCKGRD METER/RANGE/PPM	.2/ 3/ 1.	.8/ 2/ 1.	.2/ 2/ 0.
DILUTION FACTOR	5.55	9.29	7.09
HC CONCENTRATION PPM	2412.	1302.	1731.
CO CONCENTRATION PPM	2821.	384.	453.
CO2 CONCENTRATION PCT	1.84	1.23	1.63
NOX CONCENTRATION PPM	158.5	74.1	172.9
HC MASS GRAMS	256.00	100.06	77.77
CO MASS GRAMS	256.00	59.51	41.07
CO2 MASS GRAMS	2632.4	2997.5	2326.4
NOX MASS GRAMS	19.49	15.57	21.25
HC GRAMS/KM	17.60	15.36	12.67
CO GRAMS/KM	41.57	9.13	6.69
CO2 GRAMS/KM	427.4	460.1	378.9
NOX GRAMS/KM	3.16	2.39	3.46
FUEL CONSUMPTION BY CB L/100KM	23.42	22.33	18.34
RUN TIME SECONDS	506.	866.	505.
MEASURED DISTANCE KM	6.16	6.52	6.14
UFC, WET (DRY)	.836 (.859)		.881 (.875)
SCF, WET (DRY)	1.000 (.979)		1.000 (.980)
VOL (SCM)	211.2		211.2
SAM BLK (SCM)	0.00		0.00
KM (MEASURED)	12.67		12.74
FUEL CONSUMPTION L/100KM	22.86		20.02
COMPOSITE RESULTS			
TEST NUMBER 712-41			3-BAG (4-BAG)
BAROMETER MM HG 757.4		CARBON DIOXIDE G/KM 430.8	(427.0)
HUMIDITY G/KG 4.3		FUEL CONSUMPTION L/100KM 21.45	(21.24)
TEMPERATURE DEG C 24.4		HYDROCARBONS (THC) G/KM 15.08	(14.93)
		CARBON MONOXIDE G/KM 15.23	(14.79)
		OXIDES OF NITROGEN G/KM 2.85	(2.87)

SET VEHICLE EMISSIONS RESULTS 12 PERCENT MISFIRE
PROJECT 11-5830-004

TEST NO. 712-42 RUN 1 VEHICLE MODEL 70 OLDS DELTA88 ENGINE 7.5 L(455. CID) V-8 TRANSMISSION A3	VEHICLE NO.71 DATE 12/20/80 BAG CART NO. 1 DYN NO. 3 CVS NO. 2	TEST WEIGHT 2041. KG (4500. LBS) ACTUAL ROAD LOAD 9.5 KW (12.7 HP) GASOLINE EM-433-F ODOMETER ***** KM(80142. MILES)
BAROMETER 757.17 MM HG(29.81 IN HG) RELATIVE HUMIDITY 17. PCT	DRY BULB TEMP. 26.1 DEG C(79.0 DEG F) ABS. HUMIDITY 3.6 GM/KG	NOX HUMIDITY CORRECTION FACTOR .81
BAG RESULTS		
TEST CYCLE	SET	HFET
BLOWER DIF P MM. H2O(IN. H2O)	787.4 (31.0)	800.1 (31.5)
BLOWER INLET P MM. H2O(IN. H2O)	774.7 (30.5)	787.4 (31.0)
BLOWER INLET TEMP. DEG. C(DEG. F)	43.3 (110.0)	43.3 (110.0)
BLOWER REVOLUTIONS	111867.	61293.
TOT FLOW STD. CU. METRES(SCF)	214.1 (7560.)	117.0 (4133.)
HC SAMPLE METER/RANGE/PPM	19.3/ 4/1950.	24.2/ 4/2420.
HC BCKGRD METER/RANGE/PPM	.2/ 4/ 20.	.2/ 4/ 20.
CO SAMPLE METER/RANGE/PPM	98.6/11/ 522.	26.3/ 3/ 611.
CO BCKGRD METER/RANGE/PPM	.2/11/ 1.	.2/ 3/ 5.
CO2 SAMPLE METER/RANGE/PCT	98.4/ 3/ 1.85	50.8/ 2/ 2.28
CO2 BCKGRD METER/RANGE/PCT	2.8/ 3/ .04	1.3/ 2/ .05
NOX SAMPLE METER/RANGE/PPM	82.3/ 2/ 247.	37.4/ 4/ 374.
NOX BCKGRD METER/RANGE/PPM	.3/ 3/ 1.	.1/ 4/ 1.
DILUTION FACTOR	6.38	5.19
HC CONCENTRATION PPM	1933.	2404.
CO CONCENTRATION PPM	508.	577.
CO2 CONCENTRATION PCT	1.82	2.25
NOX CONCENTRATION PPM	246.1	373.2
HC MASS GRAMS	238.65	162.24
CO MASS GRAMS	124.54	78.57
CO2 MASS GRAMS	7128.7	4812.8
NOX MASS GRAMS	81.57	68.04
RUN TIME SECONDS	1397.	766.
UFC, WET (DRY)	.843 (.839)	.807 (.802)
SCF, WET (DRY)	1.000 (.977)	1.000 (.973)
VOL (SCM)	214.1	117.0
SAM BLK (SCM)	0.00	0.00
KM (MEASURED)	23.09	17.40
TEST NUMBER, 712-42		712-43
BAROMETER, MM HG 757.2		756.9
HUMIDITY, G/KG 3.6		3.8
TEMPERATURE, DEG C 26.1		25.6
CARBON DIOXIDE, G/KM 308.7		276.5
FUEL CONSUMPTION, L/100KM 14.94		13.37
HYDROCARBONS, G/KM 10.33		9.32
CARBON MONOXIDE, G/KM 3.39		4.51
OXIDES OF NITROGEN, G/KM 3.53		3.91

TABLE D-7. TEST 712 EMISSIONS RESULTS

FTP VEHICLE EMISSIONS RESULTS - 12 PERCENT MISFIRE PLUS UNKNOWN MALFUNCTION
PROJECT 11-5830-004TEST NO. 712-31 RUN 1
VEHICLE MODEL 70 OLDS. DELTA 88
ENGINE 7.5 L(455. CID) V-8
TRANSMISSION A3VEHICLE NO. 71
DATE 12/12/80
BAG CART NO. 1
DYNO NO. 3
CVS NO. 2TEST WEIGHT 2041. KG (4500. LBS)
ACTUAL ROAD LOAD 9.5 KW (12.7 HP)
GASOLINE EM-433-F
ODOMETER ***** KM(80141. MILES)BAROMETER 748.54 MM HG(29.47 IN HG)
RELATIVE HUMIDITY 27. PCT
BAG RESULTSDRY BULB TEMP. 25.0 DEG C(77.0 DEG F)
ABS. HUMIDITY 5.3 GM/KG

NOX HUMIDITY CORRECTION FACTOR .85

BAG NUMBER
DESCRIPTION

	1 COLD TRANSIENT	2 STABILIZED	3 HOT TRANSIENT	4 STABILIZED
BLOWER DIF P MM. H2O(IN. H2O)	742.0 (30.0)	774.7 (30.5)	742.0 (30.0)	774.7 (30.5)
BLOWER INLET P MM. H2O(IN. H2O)	742.0 (30.0)	774.7 (30.5)	742.0 (30.0)	774.7 (30.5)
BLOWER INLET TEMP. DEG. C(DEG. F)	43.3 (110.0)	42.8 (109.0)	42.8 (109.0)	42.8 (109.0)
BLOWER REVOLUTIONS	40573.	69622.	40511.	69578.
TOT FLOW STD. CU. METRES(SCF)	76.9 (2714.)	131.8 (4653.)	76.8 (2712.)	131.7 (4650.)
HC SAMPLE METER/RANGE/PPM	53.1/ 4/3310.	28.5/ 4/2850.	39.8/ 4/3980.	28.0/ 4/2800.
HC BCKGRD METER/RANGE/PPM	.2/ 4/ 20.	.5/ 4/ 50.	.5/ 4/ 50.	.4/ 4/ 40.
CO SAMPLE METER/RANGE/PPM	44.9/ 2/3400.	93.7/11/ 475.	27.4/ 3/ 637.	80.7/11/ 368.
CO BCKGRD METER/RANGE/PPM	.2/ 2/ 8.	2.7/11/ 8.	.1/ 3/ 5.	2.1/11/ 6.
CO2 SAMPLE METER/RANGE/PCT	92.3/ 3/ 1.73	66.1/ 3/ 1.19	85.7/ 3/ 1.59	64.0/ 3/ 1.14
CO2 BCKGRD METER/RANGE/PCT	3.3/ 3/ .05	4.5/ 3/ .07	4.1/ 3/ .06	3.7/ 3/ .06
NOX SAMPLE METER/RANGE/PPM	51.0/ 3/ 153.	73.4/ 2/ 73.	56.4/ 3/ 169.	73.3/ 2/ 73.
NOX BCKGRD METER/RANGE/PPM	.3/ 3/ 1.	1.3/ 2/ 1.	.4/ 3/ 1.	1.1/ 3/ 1.
DILUTION FACTOR	5.19	8.84	6.54	9.19
HC CONCENTRATION PPM	5294.	2806.	3938.	2764.
CO CONCENTRATION PPM	3252.	453.	611.	351.
CO2 CONCENTRATION PCT	1.69	1.12	1.53	1.09
NOX CONCENTRATION PPM	152.3	72.2	168.2	72.3
HC MASS GRAMS	232.41	213.17	174.40	209.89
CO MASS GRAMS	290.96	69.44	54.60	53.79
CO2 MASS GRAMS	2372.0	2711.1	2158.5	2633.4
NOX MASS GRAMS	19.00	15.45	20.97	15.46
HC GRAMS/KM	40.58	34.30	30.35	34.10
CO GRAMS/KM	50.33	11.17	9.50	8.74
CO2 GRAMS/KM	410.3	436.2	375.6	427.8
NOX GRAMS/KM	3.29	2.49	3.65	2.51
FUEL CONSUMPTION BY CB L/100KM	26.38	24.01	20.78	23.46
RUN TIME SECONDS	505.	868.	505.	868.
MEASURED DISTANCE KM	5.78	6.21	5.75	6.16
DFC, WET (DRY)		.858 (.850)		.875 (.867)
SCF, WET (DRY)		1.000 (.979)		1.000 (.979)
VOL (SCM)		208.6		208.5
SAM BLR (SCM)		0.00		0.00
KM (MEASURED)		11.90		11.90
FUEL CONSUMPTION L/100KM		25.16		22.17

COMPOSITE RESULTS

TEST NUMBER 712-31
BAROMETER MM HG 748.5
HUMIDITY G/KG 5.3
TEMPERATURE DEG C 25.0CARBON DIOXIDE G/KM 414.3 (411.7)
FUEL CONSUMPTION L/100KM 23.46 (23.45)
HYDROCARBONS (THC) G/KM 34.52 (34.46)
CARBON MONOXIDE G/KM 18.83 (18.11)
OXIDES OF NITROGEN G/KM 2.97 (2.98)SET VEHICLE EMISSIONS RESULTS - 12 PERCENT MISFIRE PLUS UNKNOWN MALFUNCTION
PROJECT 11-5830-004TEST NO. 712-32 RUN 1
VEHICLE MODEL 70 OLDS. DELTA 88
ENGINE 7.5 L(455. CID) V-8
TRANSMISSION A3VEHICLE NO. 71
DATE 12/12/80
BAG CART NO. 1
DYNO NO. 3
CVS NO. 2TEST WEIGHT 2041. KG (4500. LBS)
ACTUAL ROAD LOAD 9.5 KW (12.7 HP)
GASOLINE EM-433-F
ODOMETER ***** KM(80141. MILES)BAROMETER 748.54 MM HG(29.47 IN HG)
RELATIVE HUMIDITY 28. PCT
BAG RESULTSDRY BULB TEMP. 25.6 DEG C(78.0 DEG F)
ABS. HUMIDITY 5.7 GM/KG

NOX HUMIDITY CORRECTION FACTOR .86

TEST CYCLE

SET

HFET

BLOWER DIF P MM. H2O(IN. H2O)	774.7 (30.5)	774.7 (30.5)
BLOWER INLET P MM. H2O(IN. H2O)	774.7 (30.5)	774.7 (30.5)
BLOWER INLET TEMP. DEG. C(DEG. F)	43.6 (110.5)	43.3 (110.0)
BLOWER REVOLUTIONS	111946.	61295.
TOT FLOW STD. CU. METRES(SCF)	211.5 (7470.)	115.8 (4087.)
HC SAMPLE METER/RANGE/PPM	44.2/ 4/4420.	55.3/ 4/5530.
HC BCKGRD METER/RANGE/PPM	.3/ 4/ 30.	.5/ 4/ 50.
CO SAMPLE METER/RANGE/PPM	28.0/ 3/ 652.	27.5/ 3/ 640.
CO BCKGRD METER/RANGE/PPM	.1/ 3/ 2.	.2/ 3/ 5.
CO2 SAMPLE METER/RANGE/PCT	93.4/ 3/ 1.75	48.1/ 2/ 2.14
CO2 BCKGRD METER/RANGE/PCT	3.3/ 3/ .05	1.3/ 2/ .05
NOX SAMPLE METER/RANGE/PPM	73.6/ 3/ 221.	34.9/ 4/ 349.
NOX BCKGRD METER/RANGE/PPM	.5/ 3/ 2.	.2/ 4/ 2.
DILUTION FACTOR	5.94	4.87
HC CONCENTRATION PPM	4395.	5490.
CO CONCENTRATION PPM	622.	605.
CO2 CONCENTRATION PCT	1.70	2.10
NOX CONCENTRATION PPM	219.6	347.4
HC MASS GRAMS	536.12	366.46
CO MASS GRAMS	153.30	81.47
CO2 MASS GRAMS	6603.6	4449.9
NOX MASS GRAMS	76.17	66.23
RUN TIME SECONDS	1397.	765.
DFC, WET (DRY)	.832 (.824)	.795 (.798)
SCF, WET (DRY)	1.000 (.975)	1.000 (.972)
VOL (SCM)	211.5	115.8
SAM BLR (SCM)	0.00	0.00
KM (MEASURED)	21.54	16.30
TEST NUMBER,	712-32	712-33
BAROMETER, MM HG	748.5	747.8
HUMIDITY, G/KG	5.7	5.8
TEMPERATURE, DEG C	25.6	26.7
CARBON DIOXIDE, G/KM	306.6	273.1
FUEL CONSUMPTION, L/100KM	16.94	15.04
HYDROCARBONS, G/KM	24.89	22.49
CARBON MONOXIDE, G/KM	7.12	5.00
OXIDES OF NITROGEN, G/KM	3.54	4.06

TABLE D-8. TEST 721 EMISSIONS RESULTS

FTP VEHICLE EMISSIONS RESULTS - UNMODIFIED
PROJECT 11-5830-004TEST NO. 721-1 RUM 1
VEHICLE MODEL 70 DODGE CHALLENG.
ENGINE 3.7 L(225, CID) I-6
TRANSMISSION M3VEHICLE NO. 72
DATE 10/21/80
BAG CART NO. 1
DYNO NO. 3
CVS NO. 2TEST WEIGHT 1589. KG (3500. LBS)
ACTUAL ROAD LOAD 8.4 KM (11.2 HP)
GASOLINE EM-433-F
ODOMETER 99314. KM(61711. MILES)BAROMETER 744.22 MM HG(29.30 IN HG)
RELATIVE HUMIDITY 51. PCT
BAG RESULTSDRY BULB TEMP. 23.9 DEG C(75.0 DEG F)
ABS. HUMIDITY 9.7 GM/KG

NOX HUMIDITY CORRECTION FACTOR .97

BAG NUMBER DESCRIPTION	1 COLD TRANSIENT	2 STABILIZED	3 HOT TRANSIENT	4 STABILIZED
BLOWER DIF P MM. H2O(IN. H2O)	762.0 (30.0)	756.9 (29.8)	749.3 (29.5)	749.3 (29.5)
BLOWER INLET P MM. H2O(IN. H2O)	741.7 (29.2)	741.7 (29.2)	736.6 (29.0)	736.6 (29.0)
BLOWER INLET TEMP. DEG. C(DEG. F)	42.8 (109.0)	42.2 (108.0)	43.3 (110.0)	42.2 (108.0)
BLOWER REVOLUTIONS	40614.	65643.	40520.	65568.
TOT FLOW STD. CU. METRES(SCF)	76.7 (2708.)	131.7 (4649.)	76.5 (2702.)	131.6 (4648.)
HC SAMPLE METER/RANGE/PPM	35.5/ 3/ 355.	13.0/ 3/ 130.	21.9/ 3/ 219.	12.8/ 3/ 128.
HC BCKGRD METER/RANGE/PPM	1.1/ 3/ 11.	1.3/ 3/ 13.	1.4/ 3/ 14.	1.4/ 3/ 14.
CO SAMPLE METER/RANGE/PPM	62.1/ 2/ 3197.	92.8/ 11/ 436.	42.1/ 3/ 1009.	96.1/ 11/ 497.
CO BCKGRD METER/RANGE/PPM	3.2/ 2/ 16.	2.4/ 11/ 7.	4/ 3/ 9.	2.0/ 11/ 6.
CO2 SAMPLE METER/RANGE/PCT	43.6/ 3/ 1.12	43.6/ 3/ .75	59.0/ 3/ 1.04	42.6/ 3/ .73
CO2 BCKGRD METER/RANGE/PCT	3.7/ 3/ .06	3.8/ 3/ .06	3.9/ 3/ .06	3.8/ 3/ .06
NOX SAMPLE METER/RANGE/PPM	71.9/ 2/ 72.	43.9/ 2/ 44.	92.2/ 2/ 92.	41.9/ 2/ 42.
NOX BCKGRD METER/RANGE/PPM	1.0/ 2/ 1.	1.0/ 2/ 1.	.9/ 2/ 1.	1.0/ 2/ 1.
DILUTION FACTOR	9.14	16.68	11.53	17.02
HC CONCENTRATION PPM	345.	118.	206.	115.
CO CONCENTRATION PPM	3049.	445.	964.	476.
CO2 CONCENTRATION PCT	1.07	.69	.99	.67
NOX CONCENTRATION PPM	71.0	43.0	91.4	41.0
HC MASS GRAMS	15.27	8.94	9.10	8.01
CO MASS GRAMS	275.98	48.27	85.90	73.01
CO2 MASS GRAMS	1505.6	1664.0	1384.7	1618.0
NOX MASS GRAMS	10.07	10.46	12.93	9.97
HC GRAMS/KM	2.61	1.42	1.56	1.37
CO GRAMS/KM	46.96	10.85	14.74	11.51
CO2 GRAMS/KM	257.7	264.5	237.6	255.1
NOX GRAMS/KM	1.72	1.66	2.22	1.57
FUEL CONSUMPTION BY CB L/100KM	14.50	12.21	11.34	11.85
RUN TIME SECONDS	505.	867.	505.	867.
MEASURED DISTANCE KM	5.84	6.29	5.83	6.34
DFC, WET (DRY)	.922 (.907)		.931 (.916)	
SCF, WET (DRY)	1.000 (.975)		1.000 (.976)	
VOL (SCM)	208.4		208.1	
SAM BLR (SCN)	0.00		0.00	
KM (MEASURED)	12.13		12.17	
FUEL CONSUMPTION L/100KM	13.31		11.60	

COMPOSITE RESULTS

TEST NUMBER 721-11
BAROMETER MM HG 744.2
HUMIDITY G/KG 9.7
TEMPERATURE DEG C 23.9CARBON DIOXIDE G/KM 255.7 (252.9)
FUEL CONSUMPTION L/100KM 12.45 (12.34)
HYDROCARBONS (THC) G/KM 1.71 (1.69)
CARBON MONOXIDE G/KM 19.58 (19.57)
OXIDES OF NITROGEN G/KM 1.83 (1.80)VEHICLE EMISSIONS RESULTS - UNMODIFIED
PROJECT 11-5830-004TEST NO. 721-1 RUM 1
VEHICLE MODEL 70 DODGE CHALLENG.
ENGINE 3.7 L(225, CID) I-6
TRANSMISSION M3VEHICLE NO. 72
DATE 10/21/80
BAG CART NO. 1
DYNO NO. 3
CVS NO. 2TEST WEIGHT 1589. KG (3500. LBS)
ACTUAL ROAD LOAD 8.4 KM (11.2 HP)
GASOLINE EM-433-F
ODOMETER 99337. KM(61725. MILES)BAROMETER 744.22 MM HG(29.30 IN HG)
RELATIVE HUMIDITY 45. PCT
BAG RESULTSDRY BULB TEMP. 24.4 DEG C(76.0 DEG F)
ABS. HUMIDITY 8.8 GM/KG

NOX HUMIDITY CORRECTION FACTOR .94

TEST CYCLE	SET	HFET
BLOWER DIF P MM. H2O(IN. H2O)	756.9 (29.8)	747.1 (30.2)
BLOWER INLET P MM. H2O(IN. H2O)	736.6 (29.0)	751.8 (29.6)
BLOWER INLET TEMP. DEG. C(DEG. F)	42.8 (109.0)	43.3 (110.0)
BLOWER REVOLUTIONS	112079.	61397.
TOT FLOW STD. CU. METRES(SCF)	211.8 (7478.)	115.6 (4083.)
HC SAMPLE METER/RANGE/PPM	16.6/ 3/ 166.	18.0/ 3/ 180.
HC BCKGRD METER/RANGE/PPM	1.5/ 3/ 15.	1.6/ 3/ 16.
CO SAMPLE METER/RANGE/PPM	23.3/ 3/ 539.	90.9/ 11/ 449.
CO BCKGRD METER/RANGE/PPM	.1/ 3/ 2.	1.9/ 11/ 6.
CO2 SAMPLE METER/RANGE/PCT	47.9/ 3/ 1.22	84.5/ 3/ 1.56
CO2 BCKGRD METER/RANGE/PCT	4.2/ 3/ .06	4.2/ 3/ .06
NOX SAMPLE METER/RANGE/PPM	49.4/ 3/ 149.	71.4/ 3/ 214.
NOX BCKGRD METER/RANGE/PPM	1.2/ 3/ 1.	1.4/ 3/ 1.
DILUTION FACTOR	10.39	8.25
HC CONCENTRATION PPM	152.	156.
CO CONCENTRATION PPM	516.	424.
CO2 CONCENTRATION PCT	1.16	1.51
NOX CONCENTRATION PPM	147.7	213.1
HC MASS GRAMS	18.42	11.06
CO MASS GRAMS	127.20	57.07
CO2 MASS GRAMS	4510.2	3189.1
NOX MASS GRAMS	56.18	45.88
RUN TIME SECONDS	1397.	705.
DFC, WET (DRY)	.904 (.891)	.879 (.865)
SCF, WET (DRY)	1.000 (.974)	1.000 (.970)
VOL (SCM)	211.8	115.6
SAM BLR (SCN)	0.00	0.00
KM (MEASURED)	21.98	16.45
TEST NUMBER	721-12	721-13
BAROMETER MM HG	744.2	744.0
HUMIDITY G/KG	8.8	9.9
TEMPERATURE DEG C	24.4	25.0
CARBON DIOXIDE G/KM	205.2	193.8
FUEL CONSUMPTION L/100KM	9.26	8.60
HYDROCARBONS G/KM	.85	.67
CARBON MONOXIDE G/KM	5.79	3.47
OXIDES OF NITROGEN G/KM	2.56	2.79

FTP VEHICLE EMISSIONS RESULTS - RICH BEST IDLE
PROJECT 11-5830-004

COMPOSITE RESULTS		721-21		3-BAG		(4-BAG)	
TEST NUMBER		721-21		CARBON DIOXIDE		8/KM	
		753.4				239.8	
BAROMETER MM HG		753.4		FUEL CONSUMPTION		L/100KM	
HUMIDITY G/KG		3.5		HYDROCARBONS (THC)		G/KM	
TEMPERATURE DEG C		27.8		CARBON MONOXIDE		G/KM	
				OXIDES OF NITROGEN		G/KM	
						1.83	
						(1.80)	

VEHICLE EMISSIONS RESULTS - RICH BEST IDLE
PROJECT 11-5830-004

TEST NO. 721-2	RUN	VEHICLE NO.72	TEST WEIGHT 1588. KG(3500. LBS)
VEHICLE MODEL 70	DODGE CHALLENGER	DATE 10/30/80	ACTUAL ROAD LOAD 8.4 KW(11.2 HP)
ENGINE 3.7 L(225. CID) I-4		BAG CARB. NO. 1	BAG CARBINE EM-435-F
TRANSMISSION M3		DYNO NO. 3	ODOMETER 97441. KM(61802. MILES)
		CVS NO. 2	
BAROMETER 752.35 MM HG(29.62 IN HG)		DRY BULB TEMP. 25.0 DEG C(77.0 DEG F)	
RELATIVE HUMIDITY 21. PCT		ABS. HUMIDITY 4.1 G/KG	NOX HUMIDITY CORRECTION FACTOR .82
BAG RESULTS			
TEST CYCLE		SET	HFET
BLOWER DIF P MM. H2O(IN. H2O)		762.0 (30.0)	115.8 (4124.)
BLOWER INLET P MM. H2O(IN. H2O)		749.3 (29.5)	89.3/ 3/ 193.
BLOWER INLET TEMP. DEG. C(DEG. F)		43.3 (110.0)	749.3 (29.5)
BLOWER REVOLUTIONS		111888.	43.3 (110.0)
TOT FLOW STD. CU. METRES(SCF)		213.4 (7535.)	61304.
HC SAMPLE METER/RANGE/PPM		23.2/ 3/ 232.	115.8 (4124.)
HC BCKGRD METER/RANGE/PPM		1.2/ 3/ 12.	89.3/ 3/ 193.
CO SAMPLE METER/RANGE/PPM		43.4/ 3/1044.	1.5/ 3/ 16.
CO BCKGRD METER/RANGE/PPM		.3/ 3/ 7.	94.4/11/ 481.
CO2 SAMPLE METER/RANGE/PCT		66.0/ 3/ 1.18	8.11/ 2.
CO2 BCKGRD METER/RANGE/PCT		4.0/ 3/ .06	83.6/ 3/ 1.54
NOX SAMPLE METER/RANGE/PPM		55.3/ 3/ 166.	3.8/ 3/ .06
NOX BCKGRD METER/RANGE/PPM		.5/ 3/ 2.	79.5/ 3/ 239.
DILUTION FACTOR		10.25	.5/ 3/ 2.
HC CONCENTRATION PPM		221.	8.32
CO CONCENTRATION PPM		1007.	179.
CO2 CONCENTRATION PCT		1.13	462.
NOX CONCENTRATION PPM		164.5	1.49
HC MASS GRAMS		27.22	236.9
CO MASS GRAMS		250.19	12.05
CO2 MASS GRAMS		4406.1	62.78
NOX MASS GRAMS		55.13	3152.9
RUN TIME	SECOND8	1394.	43.18
DFC, WET (DRY)		.902 (.896)	765.
SCF, WET (DRY)		1.000 (.982)	.880 (.874)
VOL (SCH)		213.4	1.000 (.980)
SAM BLR (SCH)		0.00	116.8
KM (MEASURED)		21.69	0.00
			16.37
TEST NUMBER,		721-22	721-23
BAROMETER, MM HG		752.3	751.6
HUMIDITY, G/KG		4.1	1.9
TEMPERATURE, DEG C		25.0	25.6
CARBON DIOXIDE, G/KM		203.2	195.1
FUEL CONSUMPTION, L/100KM		9.61	8.68
HYDROCARBONS, G/KM		1.25	.74
CARBON MONOXIDE, G/KM		11.54	3.84
OXIDES OF NITROGEN, G/KM		2.54	2.64

TABLE D-10. TEST 721 EMISSIONS RESULTS

FTP VEHICLE EMISSIONS RESULTS - RICH BEST IDLE
PROJECT 11-5830-004TEST NO. 721-3 RUN 1
VEHICLE MODEL 70 DODGE CHALLENG.
ENGINE 3.7 L (225. CID) I-6
TRANSMISSION M3VEHICLE NO. 72
DATE 11/3/80
BAG CART NO. 1
DYNO NO. 3
CVS NO. 2TEST WEIGHT 1580. KG (3500. LBS)
ACTUAL ROAD LOAD 8.4 KW (11.2 HP)
GASOLINE EH-433-F
ODOMETER 99529. KM (61844. MILES)BAROMETER 743.71 MM HG (29.28 IN HG)
RELATIVE HUMIDITY 47. PCTDRY BULB TEMP. 26.1 DEG C (79.0 DEG F)
ABS. HUMIDITY 10.1 GM/KG

NOX HUMIDITY CORRECTION FACTOR .98

BAG RESULTS
DESCRIPTION
BLOWER DIF P MM. H2O (IN. H2O)
BLOWER INLET P MM. H2O (IN. H2O)
BLOWER INLET TEMP. DEG. C (DEG. F)
BLOWER REVOLUTIONS
TOT FLOW STD. CU. METRES (SCF)
HC SAMPLE METER/RANGE/PPM
HC BCKGRD METER/RANGE/PPM
CO SAMPLE METER/RANGE/PPM
CO BCKGRD METER/RANGE/PPM
CO2 SAMPLE METER/RANGE/PCT
CO2 BCKGRD METER/RANGE/PCT
NOX SAMPLE METER/RANGE/PPM
NOX BCKGRD METER/RANGE/PPM
DILUTION FACTOR
HC CONCENTRATION PPM
CO CONCENTRATION PPM
CO2 CONCENTRATION PCT
NOX CONCENTRATION PPM
HC MASS GRAMS
CO MASS GRAMS
CO2 MASS GRAMS
NOX MASS GRAMS
HC GRAMS/KM
CO GRAMS/KM
CO2 GRAMS/KM
NOX GRAMS/KM
FUEL CONSUMPTION BY CB L/100KM
RUN TIME SECONDS
MEASURED DISTANCE KM
DFC, WET (DRY)
SCF, WET (DRY)
VOL (SCH)
SAM BLR (SCH)
KM (MEASURED)
FUEL CONSUMPTION L/100KM1 COLD TRANSIENT 2 STABILIZED 3 HOT TRANSIENT 4 STABILIZED
762.0 (30.0) 762.0 (30.0) 762.0 (30.0) 762.0 (30.0)
745.8 (29.4) 749.3 (29.5) 749.3 (29.5) 735.5 (29.0)
43.9 (111.0) 43.6 (110.5) 43.6 (110.5) 43.6 (110.5)
40530. 49634. 40511. 49570.
76.3 (2694.) 131.1 (4629.) 76.3 (2691.) 131.2 (4632.)
33.2/ 3/ 382. 21.3/ 3/ 213. 28.1/ 3/ 281. 21.4/ 3/ 214.
1.3/ 3/ 13. 1.3/ 3/ 13. 1.6/ 3/ 16. 1.5/ 3/ 15.
66.8/ 2/ 3542. 63.1/ 3/ 1604. 69.5/ 3/ 1805. 63.3/ 3/ 1620.
1.2/ 2/ 8. 1.2/ 3/ 5. 1.4/ 3/ 9. 1.2/ 3/ 5.
61.2/ 3/ 1.09 39.0/ 3/ .66 55.4/ 3/ .99 39.2/ 3/ .66
1.5/ 3/ .05 3.3/ 3/ .05 3.9/ 3/ .06 4.3/ 3/ .07
73.5/ 2/ 74. 42.1/ 2/ 42. 88.0/ 2/ 88. 42.1/ 2/ 42.
1.2/ 2/ 1. 1.2/ 2/ 1. 1.1/ 2/ 1. 1.1/ 2/ 1.
9.14 16.02 11.22 15.92
370. 201. 256. 200.
3467. 1556. 1736. 1570.
1.04 .61 .94 .60
72.4 41.0 87.0 41.1
16.29 15.18 11.72 15.12
305.99 237.39 154.09 239.62
1451.2 1468.3 1308.6 1443.4
10.36 10.07 12.44 10.10
2.82 2.42 2.01 2.39
32.34 37.83 26.38 37.96
251.0 234.0 224.1 228.4
1.79 1.41 2.13 1.50
14.61 12.85 11.60 12.62
505. 868. 505. 868.
5.78 6.28 5.84 6.32
.920 (.966) .928 (.913)
1.000 (.977) 1.000 (.978)
207.4 207.4
0.00 0.00
12.06 12.16
13.69 13.13

COMPOSITE RESULTS

TEST NUMBER 721-31
BAROMETER MM HG 743.7
HUMIDITY G/KG 10.1
TEMPERATURE DEG C 26.13-BAG (4-BAG)
CARBON DIOXIDE G/KM 234.8 (233.1)
FUEL CONSUMPTION L/100KM 12.87 (12.80)
HYDROCARBONS (THC) G/KM 2.39 (2.38)
CARBON MONOXIDE G/KM 37.68 (37.73)
OXIDES OF NITROGEN G/KM 1.79 (1.79)VEHICLE EMISSIONS RESULTS - RICH BEST IDLE
PROJECT 11-5830-004TEST NO. 721-3 RUN 1
VEHICLE MODEL 70 DODGE CHALLENG.
ENGINE 3.7 L (225. CID) I-6
TRANSMISSION M3VEHICLE NO. 72
DATE 11/3/80
BAG CART NO. 1
DYNO NO. 3
CVS NO. 2TEST WEIGHT 1588. KG (3500. LBS)
ACTUAL ROAD LOAD 8.4 KW (11.2 HP)
GASOLINE EH-433-F
ODOMETER 99551. KM (61858. MILES)BAROMETER 742.95 MM HG (29.25 IN HG)
RELATIVE HUMIDITY 44. PCTDRY BULB TEMP. 26.1 DEG C (79.0 DEG F)
ABS. HUMIDITY 9.4 GM/KG

NOX HUMIDITY CORRECTION FACTOR .96

BAG RESULTS
TEST CYCLE
BLOWER DIF P MM. H2O (IN. H2O)
BLOWER INLET P MM. H2O (IN. H2O)
BLOWER INLET TEMP. DEG. C (DEG. F)
BLOWER REVOLUTIONS
TOT FLOW STD. CU. METRES (SCF)
HC SAMPLE METER/RANGE/PPM
HC BCKGRD METER/RANGE/PPM
CO SAMPLE METER/RANGE/PPM
CO BCKGRD METER/RANGE/PPM
CO2 SAMPLE METER/RANGE/PCT
CO2 BCKGRD METER/RANGE/PCT
NOX SAMPLE METER/RANGE/PPM
NOX BCKGRD METER/RANGE/PPM
DILUTION FACTOR
HC CONCENTRATION PPM
CO CONCENTRATION PPM
CO2 CONCENTRATION PCT
NOX CONCENTRATION PPM
HC MASS GRAMS
CO MASS GRAMS
CO2 MASS GRAMS
NOX MASS GRAMS
RUN TIME SECONDS
DFC, WET (DRY)
SCF, WET (DRY)
VOL (SCH)
SAM BLR (SCH)
KM (MEASURED)
TEST NUMBER,
BAROMETER, MM HG
HUMIDITY, G/KG
TEMPERATURE, DEG C
CARBON DIOXIDE, G/KM
FUEL CONSUMPTION, L/100KM
HYDROCARBONS, G/KM
CARBON MONOXIDE, G/KM
OXIDES OF NITROGEN, G/KMSET HFET
762.0 (30.0) 774.7 (30.5)
749.3 (29.5) 756.9 (29.8)
43.8 (110.5) 43.9 (111.0)
111987. 61347.
210.6 (7435.) 115.0 (4060.)
23.5/ 3/ 235. 20.5/ 3/ 205.
1.5/ 3/ 15. 1.6/ 3/ 16.
48.1/ 3/ 1171. 26.3/ 3/ 611.
1.1/ 3/ 2. 1.1/ 3/ 2.
66.9/ 3/ 1.20 86.8/ 3/ 1.61
4.4/ 3/ .07 4.3/ 3/ .07
50.4/ 3/ 151. 78.4/ 3/ 235.
1.4/ 3/ 1. 1.3/ 3/ 1.
10.02 7.93
221. 191.
1125. 582.
1.14 1.55
150.1 234.4
26.89 22.64
275.79 77.69
4396.5 3270.1
57.99 47.77
1397. 765.
1900 (.887) .874 (.863)
1.000 (.975) 1.000 (.972)
210.6 115.0
0.00 0.00
21.82 16.56
721-32 721-33
743.0 741.9
9.4 8.3
26.1 25.6
201.5 197.5
9.61 8.65
1.23 .76
12.64 4.70
2.66 2.88

TABLE D-11. TEST 722 EMISSIONS RESULTS
FTP VEHICLE EMISSIONS RESULTS - UNMODIFIED
PROJECT 11-5830-004

TEST NO. 722-1 RUN 1
VEHICLE MODEL 70 DODGE CHALLENGER
ENGINE 3.7 L(225, CID) -6
TRANSMISSION

VEHICLE NO. 72
DATE 10/10/80
BAG CART NO. 1
DYNO NO. 3
CVS NO. 2

TEST WEIGHT 1588, KG(3500, LBS)
ACTUAL ROAD LOAD 8.4 KW(11.2 HP)
GASOLINE EM-433-F
ODOMETER 93907, KM(61458, MILES)

BAROMETER 743.46 MM HG(29.27 IN HG)
RELATIVE HUMIDITY 53, PCT

DRY BULB TEMP. 25.6 DEG C(78.0 DEG F)
ABS. HUMIDITY 11.1 GM/KG

NOX HUMIDITY CORRECTION FACTOR 1.01

BAG RESULTS
BAG NUMBER
DESCRIPTION

	1 COLD TRANSIENT	2 STABILIZED	3 HOT TRANSIENT	4 STABILIZED
BLOWER DIF P MM, H2O(IN, H2O)	749.3 (29.5)	762.0 (30.0)	749.3 (29.5)	762.0 (30.0)
BLOWER INLET P MM, H2O(IN, H2O)	736.6 (29.0)	736.6 (29.0)	723.9 (28.5)	736.6 (29.0)
BLOWER INLET TEMP. DEG. C(DEG. F)	42.2 (108.0)	41.7 (107.0)	43.9 (111.0)	42.8 (109.0)
BLOWER REVOLUTIONS	40591.	69558.	40505.	69538.
TOT FLOW STD. CU. METRES(SCF)	76.7 (2709.)	131.5 (4644.)	76.4 (2699.)	131.2 (4633.)
HC SAMPLE METER/RANGE/PPM	37.0/ 3/ 370.	14.9/ 3/ 149.	22.1/ 3/ 221.	13.9/ 3/ 139.
HC BCKGRD METER/RANGE/PPM	1.4/ 3/ 14.	1.3/ 3/ 13.	1.3/ 3/ 13.	1.3/ 3/ 13.
CO SAMPLE METER/RANGE/PPM	61.0/ 2/ 3119.	27.0/ 3/ 628.	46.0/ 3/ 1114.	25.0/ 3/ 579.
CO BCKGRD METER/RANGE/PPM	.5/ 2/ 19.	.9/ 3/ 20.	.5/ 3/ 11.	.6/ 3/ 14.
CO2 SAMPLE METER/RANGE/PCT	65.8/ 3/ 1.18	44.6/ 3/ .76	58.9/ 3/ 1.04	42.3/ 3/ .73
CO2 BCKGRD METER/RANGE/PCT	3.4/ 3/ .05	3.6/ 3/ .06	3.7/ 3/ .06	3.9/ 3/ .06
NOX SAMPLE METER/RANGE/PPM	87.3/ 2/ 87.	46.7/ 2/ 47.	92.9/ 2/ 93.	43.0/ 2/ 44.
NOX BCKGRD METER/RANGE/PPM	1.4/ 2/ 1.	1.2/ 2/ 1.	.8/ 2/ 1.	.9/ 2/ 1.
DILUTION FACTOR	8.84	15.96	11.45	16.75
HC CONCENTRATION PPM	358.	137.	209.	127.
CO CONCENTRATION PPM	2979.	589.	1062.	549.
CO2 CONCENTRATION PCT	1.13	.71	.99	.67
NOX CONCENTRATION PPM	85.1	45.6	92.2	43.0
HC MASS GRAMS	15.82	10.38	9.22	9.59
CO MASS GRAMS	266.01	90.19	94.49	33.82
CO2 MASS GRAMS	1591.1	1715.1	1384.4	1618.7
NOX MASS GRAMS	12.78	11.31	13.64	10.91
HC GRAMS/KM	2.66	1.62	1.56	1.49
CO GRAMS/KM	44.68	14.11	15.96	13.06
CO2 GRAMS/KM	267.2	268.4	233.8	252.3
NOX GRAMS/KM	2.15	1.82	2.30	1.70
FUEL CONSUMPTION BY CB L/100KM	14.76	12.62	11.26	11.85
RUN TIME	504.	867.	505.	867.
MEASURED DISTANCE	5.95	6.39	5.92	6.42
DFC, WET (DRY)		.919 (.903)		.930 (.914)
SCF, WET (DRY)		1.000 (.974)		1.000 (.975)
VOL (SCH)		208.2		207.7
SAM BLR (SCH)		0.00		0.00
KM (MEASURED)		12.34		12.34
FUEL CONSUMPTION L/100KM		13.64		11.57

COMPOSITE RESULTS

TEST NUMBER 722-1
BAROMETER MM HG 743.5
HUMIDITY G/KG 11.1
TEMPERATURE DEG C 25.6

3-BAG (4-BAG)
CARBON DIOXIDE G/KM 258.7 (253.9)
FUEL CONSUMPTION L/100KM 12.69 (12.46)
HYDROCARBONS (THC) G/KM 1.82 (1.78)
CARBON MONOXIDE G/KM 20.96 (20.65)
OXIDES OF NITROGEN G/KM 2.02 (1.98)

VEHICLE EMISSIONS RESULTS - UNMODIFIED PROJECT 11-5830-004

TEST NO. 722-1 RUN 1
VEHICLE MODEL 70 DODGE CHALLENGER
ENGINE 3.7 L(225, CID) -6
TRANSMISSION

VEHICLE NO. 72
DATE 10/10/80
BAG CART NO. 1
DYNO NO. 3
CVS NO. 2

TEST WEIGHT 1588, KG(3500, LBS)
ACTUAL ROAD LOAD 8.4 KW(11.2 HP)
GASOLINE EM-433-F
ODOMETER 98931, KM(61473, MILES)

BAROMETER 743.46 MM HG(29.27 IN HG)
RELATIVE HUMIDITY 50, PCT

DRY BULB TEMP. 25.6 DEG C(78.0 DEG F)
ABS. HUMIDITY 10.4 GM/KG

NOX HUMIDITY CORRECTION FACTOR .99

BAG RESULTS
TEST CYCLE

	SET	HFET
BLOWER DIF P MM, H2O(IN, H2O)	749.3 (29.5)	749.3 (29.5)
BLOWER INLET P MM, H2O(IN, H2O)	736.6 (29.0)	731.5 (28.8)
BLOWER INLET TEMP. DEG. C(DEG. F)	41.7 (107.0)	43.9 (111.0)
BLOWER REVOLUTIONS	112676.	61414.
TOT FLOW STD. CU. METRES(SCF)	213.2 (7524.)	115.8 (4088.)
HC SAMPLE METER/RANGE/PPM	17.1/ 3/ 171.	19.4/ 3/ 194.
HC BCKGRD METER/RANGE/PPM	1.4/ 3/ 14.	1.3/ 3/ 13.
CO SAMPLE METER/RANGE/PPM	27.4/ 3/ 637.	92.7/ 11/ 465.
CO BCKGRD METER/RANGE/PPM	.1/ 3/ 2.	1.3/ 11/ 4.
CO2 SAMPLE METER/RANGE/PCT	66.7/ 3/ 1.20	83.2/ 3/ 1.54
CO2 BCKGRD METER/RANGE/PCT	4.1/ 3/ .06	3.9/ 3/ .06
NOX SAMPLE METER/RANGE/PPM	44.3/ 3/ 133.	69.1/ 3/ 207.
NOX BCKGRD METER/RANGE/PPM	.5/ 3/ 2.	.6/ 3/ 2.
DILUTION FACTOR	10.50	8.37
HC CONCENTRATION PPM	158.	181.
CO CONCENTRATION PPM	611.	441.
CO2 CONCENTRATION PCT	1.14	1.48
NOX CONCENTRATION PPM	131.5	205.7
HC MASS GRAMS	19.46	12.07
CO MASS GRAMS	151.50	59.48
CO2 MASS GRAMS	4449.9	3144.7
NOX MASS GRAMS	33.01	43.68
RUN TIME	1405.	766.
DFC, WET (DRY)	.905 (.890)	.881 (.866)
SCF, WET (DRY)	1.000 (.973)	1.000 (.972)
VOL (SCH)	213.2	115.8
SAM BLR (SCH)	0.00	0.00
KM (MEASURED)	21.97	16.62

TEST NUMBER 722-1
BAROMETER MM HG 743.5
HUMIDITY G/KG 10.4
TEMPERATURE DEG C 25.6
CARBON DIOXIDE G/KM 202.6
FUEL CONSUMPTION L/100KM 9.23
HYDROCARBONS G/KM .89
CARBON MONOXIDE G/KM 6.90
OXIDES OF NITROGEN G/KM 2.41

722-1
743.5
9.4
26.1
189.2
8.42
.73
3.58
2.63

TABLE D-12. TEST 722 EMISSIONS RESULTS
FTP VEHICLE EMISSIONS RESULTS - 12 PERCENT MISFIRE
PROJECT 11-5830-004

TEST NO. 722-2 RUN 1
VEHICLE MODEL 70 DODGE CHALLENGER
ENGINE 3.7 L(225, CID) I-6
TRANSMISSION N3

VEHICLE NO.72
DATE 10/13/80
BAG CART NO. 1
DYNO NO. 3
CVS NO. 2

TEST WEIGHT 1588, KG(3500, LBS)
ACTUAL ROAD LOAD 8.4 KW(11.2 HP)
GASOLINE EM-433-F
ODOMETER 99029, KM(61534, MILES)

BAROMETER 738.12 MM HG(29.06 IN HG)
RELATIVE HUMIDITY 59, PCT

DRY BULB TEMP. 24.4 DEG C(75.0 DEG F)
ABS. HUMIDITY 11.7 G/KG

NOX HUMIDITY CORRECTION FACTOR 1.03

BAG RESULTS

BAG NUMBER
DESCRIPTION
BLOWER DIF P MM, H2O(IN, H2O)
BLOWER INLET P MM, H2O(IN, H2O)
BLOWER INLET TEMP, DEG, C(DEG, F)
BLOWER REVOLUTIONS
TOT FLOW STD, CU, METRES(SCF)
HC SAMPLE METER/RANGE/PPM
HC BCKGRD METER/RANGE/PPM
CO SAMPLE METER/RANGE/PPM
CO BCKGRD METER/RANGE/PPM
CO2 SAMPLE METER/RANGE/PCT
CO2 BCKGRD METER/RANGE/PCT
NOX SAMPLE METER/RANGE/PPM
NOX BCKGRD METER/RANGE/PPM
DILUTION FACTOR
HC CONCENTRATION PPM
CO CONCENTRATION PPM
CO2 CONCENTRATION PCT
NOX CONCENTRATION PPM
HC MASS GRAMS
CO MASS GRAMS
CO2 MASS GRAMS
NOX MASS GRAMS
HC GRAMS/KM
CO GRAMS/KM
CO2 GRAMS/KM
NOX GRAMS/KM
FUEL CONSUMPTION BY CB L/100KM
RUN TIME SECONDS
MEASURED DISTANCE KM
DFC, WET (DRY)
SCF, WET (DRY)
VOL (SCM)
SAM BLR (SCM)
KM (MEASURED)
FUEL CONSUMPTION L/100KM

1 COLD TRANSIENT	2 STABILIZED	3 HOT TRANSIENT	4 STABILIZED
756.9 (29.8)	756.9 (29.8)	741.7 (29.2)	749.3 (29.5)
734.4 (29.0)	734.4 (29.0)	723.9 (28.5)	736.4 (29.0)
43.3 (110.0)	43.1 (109.5)	43.6 (110.5)	42.5 (108.5)
40546.	69648.	40484.	69585.
75.9 (2678.)	130.4 (4603.)	75.9 (2678.)	130.4 (4604.)
15.1/ 4/ 1510.	83.5/ 3/ 833.	12.2/ 4/ 1220.	85.5/ 3/ 855.
1/ 4/ 10.	2/ 4/ 20.	2/ 4/ 20.	2/ 4/ 20.
62.6/ 2/ 3233.	31.4/ 3/ 733.	55.1/ 3/ 1367.	29.9/ 3/ 699.
3/ 2/ 11.	2/ 3/ 5.	1/ 3/ 2.	1/ 3/ 2.
42.7/ 3/ 1.12	42.3/ 3/ .72	59.4/ 3/ 1.03	42.0/ 3/ .72
4.2/ 3/ .06	4.2/ 3/ .06	4.1/ 3/ .06	4.0/ 3/ .06
75.6/ 2/ 76.	47.3/ 2/ 47.	32.5/ 3/ 98.	48.1/ 3/ 144.
2.0/ 2/ 2.	1.8/ 2/ 2.	1/ 3/ 1.	1.1/ 2/ 1.
8.49	15.31	10.43	15.44
1501.	816.	1202.	836.
3092.	707.	1312.	874.
1.06	.66	.67	.66
73.8	45.4	95.4	143.3
65.66	61.36	52.57	62.88
273.04	107.36	115.84	102.27
1472.0	1576.1	1353.0	1570.0
11.06	11.74	14.44	36.89
11.22	9.74	9.07	9.98
46.65	17.04	19.99	16.23
251.5	250.2	233.4	249.1
1.89	1.84	2.49	5.85
15.38	13.14	12.53	13.07
505.	858.	504.	867.
5.85	6.30	5.80	6.30
.915 (.898)		.924 (.906)	
1.000 (.973)		1.000 (.973)	
206.2		206.3	
0.00		0.00	
12.15		12.10	
14.22		12.81	

COMPOSITE RESULTS

TEST NUMBER 722-21
BAROMETER MM HG 738.1
HUMIDITY G/KG 11.7
TEMPERATURE DEG C 24.4

3-BAG (4-BAG)
CARBON DIOXIDE G/KM 245.7 (245.6)
FUEL CONSUMPTION L/100KM 13.44 (13.42)
HYDROCARBONS (THC) G/KM 9.84 (9.73)
CARBON MONOXIDE G/KM 23.98 (23.74)
OXIDES OF NITROGEN G/KM 2.04 (3.23)

VEHICLE EMISSIONS RESULTS - 12 PERCENT MISFIRE
PROJECT 11-5830-004

TEST NO. 722-2 RUN 2
VEHICLE MODEL 70 DODGE CHALLENGER
ENGINE 3.7 L(225, CID) I-6
TRANSMISSION N3

VEHICLE NO.72
DATE 10/17/80
BAG CART NO. 1
DYNO NO. 3
CVS NO. 2

TEST WEIGHT 1588, KG(3500, LBS)
ACTUAL ROAD LOAD 8.4 KW(11.2 HP)
GASOLINE EM-433-F
ODOMETER 99134, KM(61599, MILES)

BAROMETER 736.35 MM HG(28.99 IN HG)
RELATIVE HUMIDITY 54, PCT

DRY BULB TEMP. 26.7 DEG C(80.0 DEG F)
ABS. HUMIDITY 12.2 G/KG

NOX HUMIDITY CORRECTION FACTOR 1.05

BAG RESULTS

TEST CYCLE
BLOWER DIF P MM, H2O(IN, H2O)
BLOWER INLET P MM, H2O(IN, H2O)
BLOWER INLET TEMP, DEG, C(DEG, F)
BLOWER REVOLUTIONS
TOT FLOW STD, CU, METRES(SCF)
HC SAMPLE METER/RANGE/PPM
HC BCKGRD METER/RANGE/PPM
CO SAMPLE METER/RANGE/PPM
CO BCKGRD METER/RANGE/PPM
CO2 SAMPLE METER/RANGE/PCT
CO2 BCKGRD METER/RANGE/PCT
NOX SAMPLE METER/RANGE/PPM
NOX BCKGRD METER/RANGE/PPM
DILUTION FACTOR
HC CONCENTRATION PPM
CO CONCENTRATION PPM
CO2 CONCENTRATION PCT
NOX CONCENTRATION PPM
HC MASS GRAMS
CO MASS GRAMS
CO2 MASS GRAMS
NOX MASS GRAMS
RUN TIME SECONDS
DFC, WET (DRY)
SCF, WET (DRY)
VOL (SCM)
SAM BLR (SCM)
KM (MEASURED)
TEST NUMBER,
BAROMETER, MM HG
HUMIDITY, G/KG
TEMPERATURE, DEG C
CARBON DIOXIDE, G/KM
FUEL CONSUMPTION, L/100KM
HYDROCARBONS, G/KM
CARBON MONOXIDE, G/KM
OXIDES OF NITROGEN, G/KM

SET	HFET
749.3 (29.5)	762.0 (30.0)
736.4 (29.0)	749.3 (29.5)
37.8 (100.0)	40.6 (105.0)
112107.	61391.
211.4 (7466.)	114.9 (4039.)
12.9/ 4/ 1290.	17.0/ 4/ 1700.
1/ 4/ 10.	2/ 4/ 20.
32.1/ 3/ 753.	26.1/ 3/ 606.
3/ 3/ 11.	8/ 3/ 7.
64.5/ 3/ 1.15	81.3/ 3/ 1.58
3.9/ 3/ .06	4.1/ 3/ .06
44.4/ 3/ 133.	75.4/ 3/ 226.
15/ 3/ 2.	16/ 3/ 2.
9.89	7.41
1281.	1683.
713.	571.
1.10	1.53
131.9	224.6
155.17	111.52
175.60	76.46
429.4	3210.2
56.14	49.41
1397.	765.
.899 (.883)	.865 (.850)
1.000 (.972)	1.000 (.958)
214.4	114.9
0.00	0.00
21.53	16.38
722-22	722-23
736.3	736.3
12.2	10.7
26.7	25.0
197.4	196.0
9.96	9.60
7.25	6.81
8.16	4.67
2.61	3.02

TABLE D-14. TEST 723 EMISSIONS RESULTS

FTP VEHICLE EMISSIONS RESULTS - UNMODIFIED
PROJECT 11-5830-004TEST NO. 723-1 RUN 1
VEHICLE MODEL 70 DODGE CHALLENG.
ENGINE 3.7 L(225, CID) I-6
TRANSMISSION M3VEHICLE NO. 72
DATE 11/ 4/80
BAG CART NO. 1
DYNO NO. 3
CVS NO. 2TEST WEIGHT 1586, KG(3500, LBS)
ACTUAL ROAD LOAD 8.4 KW(11.2 HP)
GASOLINE EM-433-F
ODOMETER 97636, KM(61911, MILES)BAROMETER 749.28 MM HG(29.46 IN HG)
RELATIVE HUMIDITY 47. PCTDRY BULB TEMP. 26.1 DEG C(79.0 DEG F)
ABS. HUMIDITY 10.0 GM/KG

NOX HUMIDITY CORRECTION FACTOR .98

BAG RESULTS

DESCRIPTION	1 COLD TRANSIENT	2 STABILIZED	3 HOT TRANSIENT	4 STABILIZED
BLOWER DIF P MM, H2O(IN, H2O)	767.1 (30.2)	767.1 (30.2)	762.0 (30.0)	762.0 (30.0)
BLOWER INLET P MM, H2O(IN, H2O)	749.3 (29.5)	749.3 (29.5)	741.7 (29.2)	738.6 (29.0)
BLOWER INLET TEMP, DEG. C(DEG. F)	41.1 (106.0)	41.7 (107.0)	44.2 (111.5)	43.3 (110.0)
BLOWER REVOLUTIONS	40516.	49553.	40471.	49509.
TOT FLOW STD. CU. METRES(SCF)	77.1 (2723.)	132.3 (4670.)	76.7 (2708.)	132.0 (4660.)
HC SAMPLE METER/RANGE/PPM	33.1/ 3/ 331.	12.2/ 3/ 122.	20.7/ 3/ 207.	11.5/ 3/ 115.
HC BCKGRD METER/RANGE/PPM	1.1/ 3/ 11.	1.2/ 3/ 12.	1.4/ 3/ 14.	1.2/ 3/ 12.
CO SAMPLE METER/RANGE/PPM	98.2/ 3/ 2865.	82.9/ 11/ 384.	42.9/ 3/ 1031.	75.3/ 11/ 329.
CO BCKGRD METER/RANGE/PPM	.1/ 3/ 2.	1.0/ 11/ 3.	.1/ 3/ 2.	.7/ 11/ 2.
CO2 SAMPLE METER/RANGE/PCT	43.3/ 3/ 1.13	43.0/ 3/ .73	58.4/ 3/ 1.03	42.3/ 3/ .73
CO2 BCKGRD METER/RANGE/PCT	3.1/ 3/ .05	3.5/ 3/ .05	3.2/ 3/ .05	3.4/ 3/ .05
NOX SAMPLE METER/RANGE/PPM	75.8/ 2/ 76.	44.2/ 2/ 44.	90.3/ 2/ 90.	46.1/ 2/ 46.
NOX BCKGRD METER/RANGE/PPM	.8/ 2/ 1.	.6/ 2/ 1.	.9/ 2/ 1.	.9/ 2/ 1.
DILUTION FACTOR	9.32	17.11	11.54	17.32
HC CONCENTRATION PPM	321.	111.	194.	104.
CO CONCENTRATION PPM	2758.	370.	993.	318.
CO2 CONCENTRATION PCT	1.09	.68	.99	.68
NOX CONCENTRATION PPM	75.3	43.6	99.5	45.3
HC MASS GRAMS	14.28	8.44	8.59	7.89
CO MASS GRAMS	247.58	53.98	93.61	46.93
CO2 MASS GRAMS	1534.0	1654.5	1385.0	1645.4
NOX MASS GRAMS	10.86	10.79	12.84	11.17
HC GRAMS/KM	2.44	1.34	1.47	1.25
CO GRAMS/KM	42.26	9.04	15.16	7.74
CO2 GRAMS/KM	261.8	262.4	237.0	260.8
NOX GRAMS/KM	1.85	1.71	2.20	1.77
FUEL CONSUMPTION BY CB L/100KM	14.34	11.99	11.33	11.62
RUN TIME SECONDS	505.	867.	505.	867.
MEASURED DISTANCE KM	5.86	6.30	5.84	6.31
DFC, WET (DRY)		.924 (.910)		.932 (.918)
SCF, WET (DRY)		1.000 (.977)		1.000 (.977)
VOL (SCH)		209.4		208.7
SAM BLR (SCH)		0.00		0.00
KM (MEASURED)		12.16		12.15
FUEL CONSUMPTION L/100KM		13.12		11.58

COMPOSITE RESULTS

TEST NUMBER	723-11	CARBON DIOXIDE	8/KM	3-BAG	(4-BAG)
BAROMETER MM HG	748.3	FUEL CONSUMPTION L/100KM		255.3	(254.9)
HUMIDITY G/KG	10.0	HYDROCARBONS (TIC)	6/KM	12.30	(12.25)
TEMPERATURE DEG C	26.1	CARBON MONOXIDE	8/KM	1.60	(1.58)
		OXIDES OF NITROGEN	8/KM	17.60	(17.21)
				1.87	(1.89)

VEHICLE EMISSIONS RESULTS - UNMODIFIED
PROJECT 11-5830-004TEST NO. 723-1 RUN 1
VEHICLE MODEL 70 DODGE CHALLENG.
ENGINE 3.7 L(225, CID) I-6
TRANSMISSION M3VEHICLE NO. 72
DATE 11/ 4/80
BAG CART NO. 1
DYNO NO. 3
CVS NO. 2TEST WEIGHT 1588, KG(3500, LBS)
ACTUAL ROAD LOAD 8.4 KW(11.2 HP)
GASOLINE EM-433-F
ODOMETER 97654, KM(61922, MILES)BAROMETER 748.28 MM HG(29.46 IN HG)
RELATIVE HUMIDITY 40. PCTDRY BULB TEMP. 26.1 DEG C(79.0 DEG F)
ABS. HUMIDITY 8.6 GM/KG

NOX HUMIDITY CORRECTION FACTOR .94

BAG RESULTS

TEST CYCLE	SET	HFEY
BLOWER DIF P MM, H2O(IN, H2O)	752.0 (30.0)	762.0 (30.0)
BLOWER INLET P MM, H2O(IN, H2O)	746.8 (29.4)	741.7 (29.2)
BLOWER INLET TEMP, DEG. C(DEG. F)	43.3 (110.0)	43.3 (110.0)
BLOWER REVOLUTIONS	111997.	61340.
TOT FLOW STD. CU. METRES(SCF)	212.4 (7500.)	113.4 (4109.)
HC SAMPLE METER/RANGE/PPM	16.4/ 3/ 164.	16.6/ 3/ 166.
HC BCKGRD METER/RANGE/PPM	1.2/ 3/ 12.	1.4/ 3/ 14.
CO SAMPLE METER/RANGE/PPM	88.7/ 11/ 431.	81.5/ 11/ 373.
CO BCKGRD METER/RANGE/PPM	.5/ 11/ 2.	.5/ 11/ 1.
CO2 SAMPLE METER/RANGE/PCT	68.0/ 3/ 1.22	83.8/ 3/ 1.35
CO2 BCKGRD METER/RANGE/PCT	3.6/ 3/ .06	3.9/ 3/ .06
NOX SAMPLE METER/RANGE/PPM	51.6/ 3/ 155.	75.7/ 3/ 227.
NOX BCKGRD METER/RANGE/PPM	.4/ 3/ 1.	.3/ 3/ 1.
DILUTION FACTOR	10.46	8.37
HC CONCENTRATION PPM	153.	154.
CO CONCENTRATION PPM	413.	357.
CO2 CONCENTRATION PCT	1.17	1.50
NOX CONCENTRATION PPM	153.7	226.3
HC MASS GRAMS	18.76	10.31
CO MASS GRAMS	102.18	48.33
CO2 MASS GRAMS	4564.0	3195.5
NOX MASS GRAMS	38.46	75.67
RUN TIME SECONDS	1393.	745.
DFC, WET (DRY)	.904 (.893)	.881 (.871)
SCF, WET (DRY)	1.000 (.976)	1.000 (.974)
VOL (SCH)	212.4	116.4
SAM BLR (SCH)	0.00	0.00
KM (MEASURED)	21.84	16.41
TEST NUMBER	723-12	723-13
BAROMETER MM HG	748.3	748.0
HUMIDITY G/KG	8.6	7.7
TEMPERATURE DEG C	26.1	26.7
CARBON DIOXIDE G/KM	207.0	194.7
FUEL CONSUMPTION L/100KM	9.35	8.59
HYDROCARBONS G/KM	.86	.63
CARBON MONOXIDE G/KM	4.68	2.95
OXIDES OF NITROGEN G/KM	2.68	2.60

TABLE D-15. TEST 723 EMISSIONS RESULTS
FTP VEHICLE EMISSIONS RESULTS LEAN IDLE
PROJECT 11-5630-004

TEST NO. 723-2 RUN 1
VEHICLE MODEL 70 DODGE CHALLENG.
ENGINE 3.7 L(225. CID) I-6
TRANSMISSION M3

VEHICLE NO.72
DATE 11/ 6/80
BAG CART NO. 1
DYNQ NO. 3
CVS NO. 2

TEST WEIGHT 1588. KG(3500. LBS)
ACTUAL ROAD LOAD 8.4 KW(11.2 HP)
GASOLINE EM-433-F
ODOMETER 79742. KM(51777. MILES)

BAROMETER 745.49 MM HG(29.35 IN HG)
RELATIVE HUMIDITY 36. PCT
BAG RESULTS

DRY BULB TEMP. 27.2 DEG C(81.0 DEG F)
ABS. HUMIDITY 8.2 GM/KG

NOX HUMIDITY CORRECTION FACTOR .92

BAG NUMBER
DESCRIPTION
BLOWER DIF P MM. H2O(IN. H2O)
BLOWER INLET P MM. H2O(IN. H2O)
BLOWER INLET TEMP. DEG. C(DEG. F)
BLOWER REVOLUTIONS
TOT FLOW STD. CU. METRES(SCF)
HC SAMPLE METER/RANGE/PPM
HC BCKGRD METER/RANGE/PPM
CO SAMPLE METER/RANGE/PPM
CO BCKGRD METER/RANGE/PPM
CO2 SAMPLE METER/RANGE/PCT
CO2 BCKGRD METER/RANGE/PCT
NOX SAMPLE METER/RANGE/PPM
NOX BCKGRD METER/RANGE/PPM
DILUTION FACTOR
HC CONCENTRATION PPM
CO CONCENTRATION PPM
CO2 CONCENTRATION PCT
NOX CONCENTRATION PPM
HC MASS GRAHS
CO MASS GRAHS
CO2 MASS GRAHS
NOX MASS GRAHS
HC GRAHS/KM
CO GRAHS/KM
CO2 GRAHS/KM
NOX GRAHS/KM
FUEL CONSUMPTION BY CB L/100KM
RUN TIME SECONDS
MEASURED DISTANCE KM
OFC, WET (DRY)
SCF, WET (DRY)
VOL (SCM)
SAM BLR (SCM)
KM (MEASURED)
FUEL CONSUMPTION L/100KM

1 COLD TRANSIENT	2 STABILIZED	3 HOT TRANSIENT	4 STABILIZED
742.0 (30.0)	742.0 (30.0)	742.0 (30.0)	756.9 (29.8)
749.3 (29.5)	749.3 (29.5)	741.7 (29.2)	736.5 (29.0)
42.2 (108.0)	42.8 (109.0)	43.3 (110.0)	43.6 (110.5)
40547.	69627.	40491.	69529.
76.7 (2709.)	131.6 (4647.)	76.5 (2702.)	131.4 (4641.)
35.3/ 3/ 333.	31.8/ 3/ 318.	45.1/ 3/ 451.	31.7/ 3/ 317.
1.1/ 3/ 11.	1.3/ 3/ 13.	1.6/ 3/ 16.	1.5/ 3/ 15.
92.5/ 3/2631.	71.9/11/ 306.	39.5/ 3/ 941.	67.3/11/ 280.
1.1/ 3/ 2.	1.1/11/ 3.	1.1/ 3/ 2.	1.0/11/ 3.
51.0/ 3/ 1.10	45.2/ 3/ .78	58.9/ 3/ 1.04	45.0/ 3/ .77
3.8/ 3/ .06	4.5/ 3/ .07	4.7/ 3/ .07	4.7/ 3/ .07
72.4/ 2/ 72.	44.7/ 2/ 45.	92.2/ 2/ 92.	44.7/ 2/ 45.
.6/ 2/ 1.	.9/ 2/ 1.	1.0/ 2/ 1.	1.0/ 2/ 1.
9.64	16.01	11.38	16.13
353.	304.	436.	303.
2542.	295.	910.	270.
1.05	.71	.98	.70
71.9	43.9	91.3	43.8
15.62	23.06	19.26	22.96
227.9	45.22	81.03	41.30
1470.1	1712.0	1366.3	1693.4
9.74	10.20	12.34	10.16
2.68	3.66	3.30	3.63
38.98	7.18	13.88	6.53
252.4	271.9	234.0	267.9
1.67	1.62	2.11	1.61
13.75	12.58	11.37	12.36
505.	867.	505.	867.
5.83	6.30	5.84	6.32
	.922 (.912)		.928 (.918)
	1.000 (.980)		1.000 (.980)
	208.3		208.0
	0.00		0.00
	12.12		12.16
	13.14		11.88

COMPOSITE RESULTS

TEST NUMBER 723-21
BAROMETER MM HG 745.5
HUMIDITY G/KG 8.2
TEMPERATURE DEG C 27.2

CARBON DIOXIDE G/KM 3-BAG (4-BAG)
FUEL CONSUMPTION L/100KM 257.5 (256.3)
HYDROCARBONS (THC) G/KM 12.49 (12.43)
CARBON MONOXIDE G/KM 3.36 (3.35)
OXIDES OF NITROGEN G/KM 15.59 (15.39)
1.77 (1.76)

VEHICLE EMISSIONS RESULTS - LEAN IDLE
PROJECT 11-5630-004

TEST NO. 723-2 RUN 1
VEHICLE MODEL 70 DODGE CHALLENG.
ENGINE 3.7 L(225. CID) I-6
TRANSMISSION M3

VEHICLE NO.72
DATE 11/ 6/80
BAG CART NO. 1
DYNQ NO. 3
CVS NO. 2

TEST WEIGHT 1588. KG(3500. LBS)
ACTUAL ROAD LOAD 8.4 KW(11.2 HP)
GASOLINE EM-433-F
ODOMETER 99765. KM(51971. MILES)

BAROMETER 744.47 MM HG(29.31 IN HG)
RELATIVE HUMIDITY 40. PCT
BAG RESULTS

DRY BULB TEMP. 25.6 DEG C(78.0 DEG F)
ABS. HUMIDITY 8.3 GM/KG

NOX HUMIDITY CORRECTION FACTOR .93

TEST CYCLE
BLOWER DIF P MM. H2O(IN. H2O)
BLOWER INLET P MM. H2O(IN. H2O)
BLOWER INLET TEMP. DEG. C(DEG. F)
BLOWER REVOLUTIONS
TOT FLOW STD. CU. METRES(SCF)
HC SAMPLE METER/RANGE/PPM
HC BCKGRD METER/RANGE/PPM
CO SAMPLE METER/RANGE/PPM
CO BCKGRD METER/RANGE/PPM
CO2 SAMPLE METER/RANGE/PCT
CO2 BCKGRD METER/RANGE/PCT
NOX SAMPLE METER/RANGE/PPM
NOX BCKGRD METER/RANGE/PPM
DILUTION FACTOR
HC CONCENTRATION PPM
CO CONCENTRATION PPM
CO2 CONCENTRATION PCT
NOX CONCENTRATION PPM
HC MASS GRAHS
CO MASS GRAHS
CO2 MASS GRAHS
NOX MASS GRAHS
RUN TIME SECONDS
OFC, WET (DRY)
SCF, WET (DRY)
VOL (SCM)
SAM BLR (SCM)
KM (MEASURED)
TEST NUMBER,
BAROMETER, MM HG
HUMIDITY, G/KG
TEMPERATURE, DEG C
CARBON DIOXIDE, G/KM
FUEL CONSUMPTION, L/100KM
HYDROCARBONS, G/KM
CARBON MONOXIDE, G/KM
OXIDES OF NITROGEN, G/KM

SET	HFET
752.0 (30.0)	762.0 (30.0)
736.6 (29.0)	736.6 (29.0)
43.3 (110.0)	43.6 (110.5)
112088.	61350.
211.4 (7473.)	115.7 (4087.)
27.9/ 3/ 279.	23.7/ 3/ 237.
1.3/ 3/ 13.	1.7/ 3/ 17.
95.4/11/ 490.	23.7/ 3/ 548.
1.7/11/ 2.	1.1/ 3/ 2.
68.2/ 3/ 1.23	84.1/ 3/ 1.55
4.0/ 3/ .04	4.2/ 3/ .04
46.2/ 3/ 139.	69.6/ 3/ 209.
.4/ 3/ 1.	.5/ 3/ 2.
10.29	8.22
257.	223.
471.	523.
1.17	1.50
137.5	207.5
32.61	14.82
115.96	70.50
4541.7	3175.0
51.52	41.69
1398.	765.
.903 (.891)	.876 (.868)
1.000 (.976)	1.000 (.974)
211.6	115.7
0.00	0.00
21.73	16.40
723-22	723-23
744.5	744.0
8.3	7.6
25.6	25.6
209.0	193.5
9.48	8.67
1.50	.70
5.34	4.30
2.37	2.54

TABLE D-16. TEST 723 EMISSIONS RESULTS

FTP		VEHICLE EMISSIONS RESULTS		LEAN IDLE	
PROJECT 11-5830-004					
TEST NO. 723-3	RUN 1	VEHICLE NO. 72	TEST WEIGHT 1508. KG (3500. LBS)		
VEHICLE MODEL 70 DODGE CHALLENGER		DATE 11/7/80	ACTUAL ROAD LOAD 8.4 KW (11.2 HP)		
ENGINE 3.7 L (225. CID) I-6		BAG CART NO. 1	GASOLINE EM-433-F		
TRANSMISSION M3		DYNO NO. 3	ODOMETER 79821. KM (62025. MILES)		
		CVS NO. 2			
BAROMETER 739.39 MM HG (29.11 IN HG)		DRY BULB TEMP. 26.7 DEG C (80.0 DEG F)	NOX HUMIDITY CORRECTION FACTOR .98		
RELATIVE HUMIDITY 44. PCT		ABS. HUMIDITY 10.0 GM/KG			
BAG RESULTS					
BAG NUMBER					
DESCRIPTION					
BLOWER DIF P MM. H2O (IN. H2O)	1	2	3	4	
BLOWER INLET P MM. H2O (IN. H2O)	COLD TRANSIENT	STABILIZED	HOT TRANSIENT	STABILIZED	
BLOWER INLET TEMP. DEG. C (DEG. F)	756.9 (29.8)	762.0 (30.0)	756.9 (29.8)	762.0 (30.0)	
BLOWER REVOLUTIONS	735.6 (29.0)	735.6 (29.0)	736.3 (29.0)	741.7 (29.2)	
TOT FLOW STD. CU. METRES (SCF)	43.9 (111.0)	43.3 (110.0)	43.3 (110.0)	43.3 (110.0)	
HC SAMPLE METER/RANGE/PPM	40577.	69532.	40519.	69604.	
HC BCKGRD METER/RANGE/PPM	76.0 (2683.)	130.5 (4609.)	75.9 (2682.)	130.4 (4603.)	
CO SAMPLE METER/RANGE/PPM	36.9/ 3/ 369.	29.8/ 3/ 298.	45.2/ 3/ 452.	32.6/ 3/ 326.	
CO BCKGRD METER/RANGE/PPM	1.1/ 3/ 1.	1.3/ 3/ 1.	1.8/ 3/ 18.	1.5/ 3/ 15.	
CO2 SAMPLE METER/RANGE/PCT	99.3/ 3/ 2912.	73.1/ 11/ 315.	42.2/ 3/ 1012.	73.7/ 11/ 339.	
CO2 BCKGRD METER/RANGE/PCT	1.1/ 3/ 25.	2.2/ 11/ 6.	1.1/ 3/ 2.	1.0/ 11/ 3.	
NOX SAMPLE METER/RANGE/PPM	62.7/ 3/ 1.12	44.3/ 3/ .76	58.5/ 3/ 1.03	42.9/ 3/ .73	
NOX BCKGRD METER/RANGE/PPM	3.6/ 3/ .06	3.6/ 3/ .06	3.4/ 3/ .05	2.9/ 3/ .04	
DILUTION FACTOR	70.4/ 2/ 70.	42.3/ 2/ 42.	92.1/ 2/ 92.	41.9/ 2/ 42.	
HC CONCENTRATION PPM	.6/ 2/ 1.	.6/ 2/ 1.	.8/ 2/ 1.	1.6/ 2/ 2.	
CO CONCENTRATION PPM	9.34	16.37	11.39	15.80	
CO2 CONCENTRATION PPM	368.	286.	436.	312.	
NOX CONCENTRATION PPM	2786.	300.	975.	327.	
HC MASS GRAMS	1.07	.71	.99	.69	
CO MASS GRAMS	69.9	41.7	91.4	40.4	
CO2 MASS GRAMS	16.13	21.51	19.07	23.45	
NOX MASS GRAMS	246.45	45.53	86.24	49.57	
HC GRAMS/KM	1485.1	1688.4	1370.5	1647.4	
CO GRAMS/KM	9.91	10.17	12.95	7.93	
CO2 GRAMS/KM	2.80	3.47	3.30	3.78	
NOX GRAMS/KM	42.82	7.34	14.92	7.99	
FUEL CONSUMPTION BY CB L/100KM	258.0	272.2	237.1	265.4	
RUN TIME SECONDS	1.72	1.64	2.24	1.58	
MEASURED DISTANCE KM	14.27	12.58	11.57	12.38	
SCF, WET (DRY)	505.	367.	505.	867.	
VOL (SCH)	5.76	6.20	5.78	6.21	
SAM BLR (SCH)	.922 (.909)		.930 (.917)		
KM (MEASURED)	1.000 (.977)		1.000 (.978)		
FUEL CONSUMPTION L/100KM	206.5		206.3		
	0.00		0.00		
	11.96		11.99		
	13.39		11.99		
COMPOSITE RESULTS					
TEST NUMBER 723-31			3-BAG	(4-BAG)	
BAROMETER MM HG 739.4			259.6	(257.6)	
HUMIDITY G/KG 10.0			12.65	(12.59)	
TEMPERATURE DEG C 26.7			3.28	(3.38)	
			15.77	(16.96)	
			1.82	(1.80)	

VEHICLE EMISSIONS RESULTS - LEAN IDLE
PROJECT 11-5830-004

TEST NO. 723-3 RUN 1
VEHICLE MODEL 70 DODGE CHALLENGER
ENGINE 3.7 L (225. CID) I-6
TRANSMISSION M3

VEHICLE NO. 72
DATE 11/7/80
BAG CART NO. 1
DYNO NO. 3
CVS NO. 2

TEST WEIGHT 1588. KG (3500. LBS)
ACTUAL ROAD LOAD 8.4 KW (11.2 HP)
GASOLINE EM-433-F
ODOMETER 79831. KM (62032. MILES)

BAROMETER 738.38 MM HG (29.07 IN HG)
RELATIVE HUMIDITY 44. PCT
BAG RESULTS

DRY BULB TEMP. 26.7 DEG C (80.0 DEG F)
ABS. HUMIDITY 10.0 GM/KG

NOX HUMIDITY CORRECTION FACTOR .98

TEST CYCLE

BLOWER DIF P MM. H2O (IN. H2O)

BLOWER INLET P MM. H2O (IN. H2O)

BLOWER INLET TEMP. DEG. C (DEG. F)

BLOWER REVOLUTIONS

TOT FLOW STD. CU. METRES (SCF)

HC SAMPLE METER/RANGE/PPM

HC BCKGRD METER/RANGE/PPM

CO SAMPLE METER/RANGE/PPM

CO BCKGRD METER/RANGE/PPM

CO2 SAMPLE METER/RANGE/PCT

CO2 BCKGRD METER/RANGE/PCT

NOX SAMPLE METER/RANGE/PPM

NOX BCKGRD METER/RANGE/PPM

DILUTION FACTOR

HC CONCENTRATION PPM

CO CONCENTRATION PPM

CO2 CONCENTRATION PPM

NOX CONCENTRATION PPM

HC MASS GRAMS

CO MASS GRAMS

CO2 MASS GRAMS

NOX MASS GRAMS

RUN TIME SECONDS

SCF, WET (DRY)

SCF, WET (DRY)

VOL (SCH)

SAM BLR (SCH)

KM (MEASURED)

TEST NUMBER, 723-32

BAROMETER, MM HG 738.4

HUMIDITY, G/KG 10.0

TEMPERATURE, DEG C 26.7

CARBON DIOXIDE, G/KM 207.6

FUEL CONSUMPTION, L/100KM 9.44

HYDROCARBONS, G/KM 1.48

CARBON MONOXIDE, G/KM 5.62

OXIDES OF NITROGEN, G/KM 2.60

SET

759.5 (29.9)

741.7 (29.2)

43.3 (110.0)

112174.

209.8 (7408.)

27.8/ 3/ 278.

1.3/ 3/ 15.

98.6/ 11/ 522.

.6/ 11/ 2.

67.6/ 3/ 1.22

2.9/ 3/ .04

48.3/ 3/ 145.

.3/ 3/ 1.

10.36

266.

500.

11.19

144.1

32.21

122.21

4514.6

56.44

1398.

.903 (.891)

1.000 (.974)

209.8

0.00

21.74

723-33

737.6

7.5

26.1

190.7

8.58

.97

4.61

2.69

MFET

756.9 (29.8)

731.5 (28.8)

43.3 (110.0)

61455.

114.9 (4059.)

25.1/ 3/ 251.

1.5/ 3/ 15.

25.4/ 3/ 589.

.2/ 3/ 5.

82.3/ 3/ 1.52

3.4/ 3/ .05

69.1/ 3/ 207.

.2/ 3/ 1.

8.38

239.

559.

1.47

206.8

15.76

74.67

3096.8

43.73

766.

.881 (.868)

1.000 (.972)

114.9

0.00

16.24

TABLE D-17. TEST 731 EMISSIONS RESULTS

FTP VEHICLE EMISSIONS RESULTS - UNMODIFIED		PROJECT 11-5830-004	
TEST NO. 731-1 RUN 1	VEHICLE NO. 73	TEST WEIGHT 1814. KG (4000. LBS)	
VEHICLE MODEL 70 CHEV MONTECARLO	DATE 12/ 3/80	ACTUAL ROAD LOAD 8.9 KW (12.0 HP)	
ENGINE 5.7 L (350, CID) V-8	BAG CART NO. 1	GASOLINE EM-433-F	
TRANSMISSION A3	DYNO NO. 3	ODOMETER ***** KM(86627, MILES)	
	CVS NO. 2		
BAROMETER 750.32 MM HG(29.54 IN HG)	DRY BULB TEMP. 24.4 DEG C(76.0 DEG F)	NOX HUMIDITY CORRECTION FACTOR .84	
RELATIVE HUMIDITY 26. PCT	ABS. HUMIDITY 4.9 GM/KG		
BAG RESULTS			
BAG NUMBER	1	2	3
DESCRIPTION	COLD TRANSIENT	STABILIZED	HOT TRANSIENT
BLOWER DIF P MM, H2O(IN, H2O)	762.0 (30.0)	762.0 (30.0)	762.0 (30.0)
BLOWER INLET P MM, H2O(IN, H2O)	762.0 (30.0)	762.0 (30.0)	762.0 (30.0)
BLOWER INLET TEMP, DEG. C(DEG. F)	42.8 (109.0)	42.8 (109.0)	43.3 (110.0)
BLOWER REVOLUTIONS	40503.	49616.	40493.
TOT FLOW STD. CU. METRES(SCF)	77.0 (2719.)	132.3 (4673.)	76.9 (2715.)
HC SAMPLE METER/RANGE/PPM	42.1/ 3/ 421.	15.2/ 3/ 152.	23.5/ 3/ 235.
HC BCKGRD METER/RANGE/PPM	1.1/ 3/ 11.	1.2/ 3/ 12.	1.3/ 3/ 13.
CO SAMPLE METER/RANGE/PPM	72.9/ 2/ 4018.	66.2/ 11/ 272.	89.7/ 11/ 439.
CO BCKGRD METER/RANGE/PPM	3/ 2/ 11.	2.2/ 11/ 6.	1.3/ 11/ 4.
CO2 SAMPLE METER/RANGE/PCT	89.4/ 3/ 1.67	61.3/ 3/ 1.09	83.7/ 3/ 1.53
CO2 BCKGRD METER/RANGE/PCT	3.4/ 3/ .05	3.2/ 3/ .04	3.2/ 3/ .05
NOX SAMPLE METER/RANGE/PPM	53.3/ 3/ 160.	59.4/ 2/ 59.	56.3/ 3/ 169.
NOX BCKGRD METER/RANGE/PPM	.1/ 3/ 0.	.8/ 2/ 1.	.3/ 3/ 1.
DILUTION FACTOR	6.39	11.85	8.31
HC CONCENTRATION PPM	412.	141.	127.
CO CONCENTRATION PPM	38.	238.	419.
CO2 CONCENTRATION PCT	1.62	1.04	1.50
NOX CONCENTRATION PPM	159.6	58.7	168.1
HC MASS GRAMS	18.28	10.76	9.91
CO MASS GRAMS	344.76	39.72	37.51
CO2 MASS GRAMS	2289.2	2512.3	2116.8
NOX MASS GRAMS	19.75	12.47	20.77
HC GRAMS/KM	3.11	1.71	1.70
CO GRAMS/KM	58.70	6.32	6.43
CO2 GRAMS/KM	389.8	399.8	362.6
NOX GRAMS/KM	3.36	1.98	3.56
FUEL CONSUMPTION BY CB L/100KM	21.00	17.72	16.14
RUN TIME	504.	868.	505.
MEASURED DISTANCE	5.87	6.28	5.84
DFC, WET (DRY)	.889 (.882)		.904 (.897)
SCF, WET (DRY)	1.000 (.980)		1.000 (.980)
VOL (SCM)	0.00		208.8
SAM BLR (SCM)			0.00
KM (MEASURED)			12.13
FUEL CONSUMPTION L/100KM			16.66
COMPOSITE RESULTS			
TEST NUMBER 731-11	CARBON DIOXIDE G/KM	3-BAG 387.5	(4-BAG) (384.4)
BAROMETER MM HG 750.3	FUEL CONSUMPTION L/100KM	17.97	(17.80)
HUMIDITY G/KG 4.9	HYDROCARBONS (THC) G/KM	2.00	(1.95)
TEMPERATURE DEG C 24.4	CARBON MONOXIDE G/KM	17.23	(16.84)
	OXIDES OF NITROGEN G/KM	2.70	(2.70)

VEHICLE EMISSIONS RESULTS - UNMODIFIED
PROJECT 11-5830-004

TEST NO. 731-1 RUN 1	VEHICLE NO. 73	TEST WEIGHT 1814. KG (4000. LBS)	
VEHICLE MODEL 70 CHEV MONTECARLO	DATE 12/ 3/80	ACTUAL ROAD LOAD 8.9 KW (12.0 HP)	
ENGINE 5.7 L (350, CID) V-8	BAG CART NO. 1	GASOLINE EM-433-F	
TRANSMISSION A3	DYNO NO. 3	ODOMETER ***** KM(86627, MILES)	
	CVS NO. 2		
BAROMETER 749.30 MM HG(29.50 IN HG)	DRY BULB TEMP. 28.9 DEG C(84.0 DEG F)	NOX HUMIDITY CORRECTION FACTOR .85	
RELATIVE HUMIDITY 22. PCT	ABS. HUMIDITY 5.5 GM/KG		
BAG RESULTS			
TEST CYCLE	SET	HFET	
BLOWER DIF P MM, H2O(IN, H2O)	774.7 (30.5)	774.7 (30.5)	
BLOWER INLET P MM, H2O(IN, H2O)	774.7 (30.5)	774.7 (30.5)	
BLOWER INLET TEMP, DEG. C(DEG. F)	42.8 (109.0)	43.3 (110.0)	
BLOWER REVOLUTIONS	111967.	81341.	
TOT FLOW STD. CU. METRES(SCF)	212.1 (7491.)	116.0 (4095.)	
HC SAMPLE METER/RANGE/PPM	24.2/ 3/ 242.	32.9/ 3/ 329.	
HC BCKGRD METER/RANGE/PPM	1.5/ 3/ 15.	1.6/ 3/ 16.	
CO SAMPLE METER/RANGE/PPM	96.7/ 11/ 503.	32.2/ 3/ 756.	
CO BCKGRD METER/RANGE/PPM	1.1/ 11/ 3.	.1/ 3/ 2.	
CO2 SAMPLE METER/RANGE/PCT	87.1/ 3/ 1.62	45.1/ 2/ 1.98	
CO2 BCKGRD METER/RANGE/PCT	3.6/ 3/ .04	1.5/ 2/ .05	
NOX SAMPLE METER/RANGE/PPM	69.7/ 3/ 209.	30.5/ 4/ 305.	
NOX BCKGRD METER/RANGE/PPM	.4/ 3/ 1.	.1/ 4/ 1.	
DILUTION FACTOR	7.93	6.44	
HC CONCENTRATION PPM	229.	315.	
CO CONCENTRATION PPM	481.	719.	
CO2 CONCENTRATION PCT	1.57	1.93	
NOX CONCENTRATION PPM	208.1	304.2	
HC MASS GRAMS	28.00	21.10	
CO MASS GRAMS	118.76	97.13	
CO2 MASS GRAMS	6094.9	4102.3	
NOX MASS GRAMS	71.99	58.91	
RUN TIME	1397.	765.	
DFC, WET (DRY)	.874 (.868)	.845 (.838)	
SCF, WET (DRY)	1.000 (.978)	1.000 (.974)	
VOL (SCM)	212.1	116.0	
SAM BLR (SCM)	0.00	0.00	
KM (MEASURED)	21.81	16.59	
TEST NUMBER, 731-12	731-13		
BAROMETER, MM HG 749.3	748.5		
HUMIDITY, G/KG 5.5	6.3		
TEMPERATURE, DEG C 28.9	30.0		
CARBON DIOXIDE, G/KM 279.5	247.2		
FUEL CONSUMPTION, L/100KM 12.47	11.12		
HYDROCARBONS, G/KM 1.28	1.27		
CARBON MONOXIDE, G/KM 5.45	5.85		
OXIDES OF NITROGEN, G/KM 3.30	3.55		

TABLE D-18. TEST 731 EMISSIONS RESULTS

FTP		VEHICLE EMISSIONS RESULTS		RICH BEST IDLE	
PROJECT 11-5830-004		PROJECT 11-5830-004		PROJECT 11-5830-004	
TEST NO.	7313	VEHICLE NO.	73	TEST WEIGHT	1814. KG (4000. LBS)
VEHICLE MODEL	70 CHEV MONTECARLO	DATE	12/ 9/80	ACTUAL ROAD LOAD	8.9 KW (12.0 HP)
ENGINE	5.7 L(350. CID) V-8	BAG CART NO.	1	GASOLINE	EM-433-F
TRANSMISSION	A3	DYNO NO.	3	ODOMETER	***** KM(***** MILES)
		CVS NO.	2		
BAROMETER	744.73 MM HG(29.32 IN HG)	DRY BULB TEMP.	23.9 DEG C(75.0 DEG F)	NOX HUMIDITY CORRECTION FACTOR	.89
RELATIVE HUMIDITY	34. PCT	ABS. HUMIDITY	6.4 GM/KG		
BAG RESULTS					
BAG NUMBER					
DESCRIPTION					
		1	2	3	4
		COLD TRANSIENT	STABILIZED	HOT TRANSIENT	STABILIZED
BLOWER DIF P MM. H2O(IN. H2O)		762.0 (30.0)	762.0 (30.0)	762.0 (30.0)	762.0 (30.0)
BLOWER INLET P MM. H2O(IN. H2O)		749.3 (29.5)	749.3 (29.5)	749.3 (29.5)	749.3 (29.5)
BLOWER INLET TEMP. DEG. C(DEG. F)		43.3 (110.0)	42.8 (109.0)	42.8 (109.0)	42.5 (108.5)
BLOWER REVOLUTIONS		40537.	69631.	40497.	69606.
TOT FLOW STD. CU. METRES(SCF)		76.5 (2700.)	131.5 (4642.)	76.5 (2700.)	131.5 (4643.)
HC SAMPLE METER/RANGE/PPM		48.5/ 3/ 485.	23.3/ 3/ 253.	31.0/ 3/ 310.	23.7/ 3/ 237.
HC BCKGRD METER/RANGE/PPM		1.4/ 3/ 16.	1.8/ 3/ 18.	1.7/ 3/ 17.	1.4/ 3/ 14.
CO SAMPLE METER/RANGE/PPM		83.6/ 2/ 4937.	81.1/ 3/ 2199.	72.9/ 3/ 1917.	75.7/ 3/ 2011.
CO BCKGRD METER/RANGE/PPM		.1/ 2/ 4.	.3/ 3/ 7.	.1/ 3/ 2.	.3/ 3/ 7.
CO2 SAMPLE METER/RANGE/PCT		81.7/ 3/ 1.50	52.7/ 3/ .92	73.9/ 3/ 1.34	51.7/ 3/ .90
CO2 BCKGRD METER/RANGE/PCT		3.7/ 3/ .06	4.0/ 3/ .06	3.7/ 3/ .06	3.5/ 3/ .05
NOX SAMPLE METER/RANGE/PPM		43.5/ 3/ 131.	45.6/ 2/ 46.	48.6/ 3/ 146.	45.2/ 2/ 45.
NOX BCKGRD METER/RANGE/PPM		.5/ 3/ 2.	2.0/ 2/ 2.	.5/ 3/ 2.	1.0/ 2/ 1.
DILUTION FACTOR		6.61	11.57	8.59	11.97
HC CONCENTRATION PPM		471.	237.	295.	274.
CO CONCENTRATION PPM		4736.	2130.	1844.	1948.
CO2 CONCENTRATION PCT		.68	.68	1.29	.85
NOX CONCENTRATION PPM		129.2	43.8	144.5	44.3
HC MASS GRAMS		20.79	17.93	13.01	17.00
CO MASS GRAMS		421.61	326.01	184.15	293.14
CO2 MASS GRAMS		2039.4	2078.0	1811.1	2048.2
NOX MASS GRAMS		16.56	9.64	16.51	9.76
HC GRAMS/KM		3.68	2.90	2.27	2.75
CO GRAMS/KM		74.56	52.76	28.63	48.27
CO2 GRAMS/KM		360.7	336.3	315.9	331.6
NOX GRAMS/KM		2.78	1.56	3.23	1.58
FUEL CONSUMPTION BY CB L/100KM		20.89	18.29	15.71	17.76
RUN TIME	SECONDS	505.	868.	504.	857.
MEASURED DISTANCE	KM	5.65	6.18	5.73	6.18
DFC, WET (DRY)		.890 (.890)		.904 (.894)	
SCF, WET (DRY)		1.000 (.978)		1.000 (.979)	
VOL (SCM)		207.9		207.9	
SAM BLR (SCM)		0.00		0.00	
KM (MEASURED)		11.83		11.91	
FUEL CONSUMPTION L/100KM		19.53		16.78	
COMPOSITE RESULTS					
TEST NUMBER	73131	CARBON DIOXIDE	G/KM	3-BAG	(4-BAG)
BAROMETER	MM HG 744.7	FUEL CONSUMPTION	L/100KM	18.11	(334.3)
HUMIDITY	G/KG 6.4	HYDROCARBONS (THC)	G/KM	2.89	(17.96)
TEMPERATURE	DEG C 23.9	CARBON MONOXIDE	G/KM	50.62	(49.29)
		OXIDES OF NITROGEN	G/KM	2.30	(2.31)

VEHICLE EMISSIONS RESULTS - RICH BEST IDLE
PROJECT 11-5830-004

TEST NO.	731-3	VEHICLE NO.	73	TEST WEIGHT	1814. KG (4000. LBS)
VEHICLE MODEL	70 CHEV MONTECARLO	DATE	12/ 9/80	ACTUAL ROAD LOAD	8.9 KW (12.0 HP)
ENGINE	5.7 L(350. CID) V-8	BAG CART NO.	1	GASOLINE	EM-433-F
TRANSMISSION	A3	DYNO NO.	3	ODOMETER	***** KM(***** MILES)
		CVS NO.	2		
BAROMETER	744.47 MM HG(29.31 IN HG)	DRY BULB TEMP.	25.0 DEG C(77.0 DEG F)	NOX HUMIDITY CORRECTION FACTOR	.86
RELATIVE HUMIDITY	30. PCT	ABS. HUMIDITY	6.0 GM/KG		
BAG RESULTS					
TEST CYCLE		SET	HFET		
BLOWER DIF P MM. H2O(IN. H2O)		774.7 (30.5)	774.7 (30.5)		
BLOWER INLET P MM. H2O(IN. H2O)		762.0 (30.0)	762.0 (30.0)		
BLOWER INLET TEMP. DEG. C(DEG. F)		42.8 (109.0)	43.1 (109.5)		
BLOWER REVOLUTIONS		112035.	61414.		
TOT FLOW STD. CU. METRES(SCF)		211.1 (7453.)	115.6 (4080.)		
HC SAMPLE METER/RANGE/PPM		29.5/ 3/ 295.	36.1/ 3/ 361.		
HC BCKGRD METER/RANGE/PPM		1.2/ 3/ 12.	1.4/ 3/ 14.		
CO SAMPLE METER/RANGE/PPM		60.5/ 3/ 1526.	46.3/ 3/ 1122.		
CO BCKGRD METER/RANGE/PPM		.3/ 3/ 7.	.2/ 3/ 5.		
CO2 SAMPLE METER/RANGE/PCT		81.7/ 3/ 1.50	43.8/ 2/ 1.91		
CO2 BCKGRD METER/RANGE/PCT		3.0/ 3/ .05	1.3/ 2/ .05		
NOX SAMPLE METER/RANGE/PPM		64.1/ 3/ 192.	30.0/ 4/ 300.		
NOX BCKGRD METER/RANGE/PPM		.4/ 3/ 1.	.2/ 4/ 2.		
DILUTION FACTOR		7.97	6.53		
HC CONCENTRATION PPM		285.	349.		
CO CONCENTRATION PPM		1461.	1067.		
CO2 CONCENTRATION PCT		1.46	1.87		
NOX CONCENTRATION PPM		191.3	298.3		
HC MASS GRAMS		34.62	23.26		
CO MASS GRAMS		358.98	143.58		
CO2 MASS GRAMS		5660.2	3956.0		
NOX MASS GRAMS		66.75	57.11		
RUN TIME	SECONDS	1397.	766.		
DFC, WET (DRY)		.875 (.866)	.847 (.840)		
SCF, WET (DRY)		1.000 (.976)	1.000 (.974)		
VOL (SCM)		211.1	115.6		
SAM BLR (SCM)		0.00	0.00		
KM (MEASURED)		21.67	16.30		
TEST NUMBER,		731-32	731-33		
BAROMETER,	MM HG	744.5	744.0		
HUMIDITY,	G/KG	6.0	6.0		
TEMPERATURE,	DEG C	25.0	27.8		
CARBON DIOXIDE,	G/KM	261.2	242.6		
FUEL CONSUMPTION,	L/100KM	12.48	11.14		
HYDROCARBONS,	G/KM	1.60	1.43		
CARBON MONOXIDE,	G/KM	16.57	8.81		
OXIDES OF NITROGEN,	G/KM	3.08	3.50		

TABLE D-19. TEST 731 EMISSIONS RESULTS

FTP		VEHICLE EMISSIONS RESULTS		RICH BEST IDLE	
PROJECT 11-5830-004		PROJECT 11-5830-004		PROJECT 11-5830-004	
TEST NO. 731-4	RUN 1	VEHICLE NO. 73	DATE 12/18/80	TEST WEIGHT 1814. KG(4000. LBS)	
VEHICLE MODEL 70 CHEV MONTECARLO		BAG CART NO. 1	ACTUAL ROAD LOAD 8.9 KW(12.0 HP)	GASOLINE EM-433-F	
ENGINE 5.7 L(350. CID) V-8		DYNO NO. 3	ODOMETER ***** KM(86627. MILES)		
TRANSMISSION A3		CVS NO. 2			
BAROMETER 741.43 MM HG(29.19 IN HG)		DRY BULB TEMP. 25.6 DEG C(78.0 DEG F)		NOX HUMIDITY CORRECTION FACTOR .95	
RELATIVE HUMIDITY 43. PCT		ABS. HUMIDITY 9.0 GM/KG			
BAG RESULTS					
BAG NUMBER		1	2	3	4
DESCRIPTION		COLD TRANSIENT	STABILIZED	HOT TRANSIENT	STABILIZED
BLOWER DIF P MM. H2O(IN. H2O)		762.0 (30.0)	762.0 (30.0)	762.0 (30.0)	762.0 (30.0)
BLOWER INLET P MM. H2O(IN. H2O)		749.3 (29.5)	749.3 (29.5)	749.3 (29.5)	749.3 (29.5)
BLOWER INLET TEMP. DEG. C(DEG. F)		43.3 (110.0)	43.6 (110.5)	43.3 (110.0)	42.8 (109.0)
BLOWER REVOLUTIONS		40583.	49588.	40588.	49508.
TOT FLOW STD. CU. METRES(SCF)		76.2 (2690.)	130.5 (4609.)	76.2 (2690.)	130.6 (4611.)
HC SAMPLE METER/RANGE/PPM		52.0/ 3/ 520.	26.4/ 3/ 244.	29.6/ 3/ 294.	25.6/ 3/ 256.
HC BCKGRD METER/RANGE/PPM		1.4/ 3/ 14.	1.5/ 3/ 15.	1.5/ 3/ 15.	1.3/ 3/ 13.
CO SAMPLE METER/RANGE/PPM		85.8/ 3/ 5140.	89.5/ 3/ 2512.	69.6/ 3/ 1809.	81.0/ 3/ 2196.
CO BCKGRD METER/RANGE/PPM		.3/ 2/ 11.	.4/ 3/ 9.	.1/ 3/ 2.	.2/ 3/ 5.
CO2 SAMPLE METER/RANGE/PCT		83.3/ 3/ 1.54	54.5/ 3/ .95	73.7/ 3/ 1.34	53.0/ 3/ .93
CO2 BCKGRD METER/RANGE/PCT		4.0/ 3/ .06	4.5/ 3/ .07	4.4/ 3/ .07	4.0/ 3/ .06
NOX SAMPLE METER/RANGE/PPM		40.1/ 3/ 120.	42.0/ 2/ 42.	43.8/ 3/ 131.	4.0/ 3/ .06
NOX BCKGRD METER/RANGE/PPM		.2/ 3/ 1.	.4/ 2/ 0.	.4/ 3/ 1.	.43/ 2/ 43.
DILUTION FACTOR		6.44	10.95	8.68	11.52
HC CONCENTRATION PPM		508.	250.	283.	244.
CO CONCENTRATION PPM		4907.	2423.	1735.	2122.
CO2 CONCENTRATION PCT		1.49	.89	1.28	.87
NOX CONCENTRATION PPM		119.8	41.6	130.3	42.8
HC MASS GRAMS		22.32	18.84	12.42	18.38
CO MASS GRAMS		435.15	368.20	153.87	322.63
CO2 MASS GRAMS		2073.0	2130.7	1785.3	2078.1
NOX MASS GRAMS		16.52	9.84	17.98	10.11
HC GRAMS/KM		3.83	3.01	2.14	2.95
CO GRAMS/KM		74.59	58.89	26.45	51.80
CO2 GRAMS/KM		355.4	340.8	306.9	333.6
NOX GRAMS/KM		2.83	1.57	3.09	1.62
FUEL CONSUMPTION BY CB L/100KM		20.69	18.90	15.16	18.11
RUN TIME	SECONDS	505.	867.	506.	866.
MEASURED DISTANCE	KM	5.83	6.25	5.82	6.23
DFC, WET (DRY)		.835 (.873)		.903 (.890)	
SCF, WET (DRY)		1.000 (.975)		1.000 (.976)	
VOL (SCM)		206.7		206.8	
SAM BLR (SCM)		0.00		0.00	
KM (MEASURED)		12.09		12.05	
FUEL CONSUMPTION L/100KM		19.77		16.69	

COMPOSITE RESULTS

TEST NUMBER 731-41
 BAROMETER MM HG 741.4
 HUMIDITY G/KG 9.0
 TEMPERATURE DEG C 25.6

3-BAG (4-BAG)
 CARBON DIOXIDE G/KM 334.5 (332.4)
 FUEL CONSUMPTION L/100KM 18.25 (18.01)
 HYDROCARBONS (THC) G/KM 2.94 (2.92)
 CARBON MONOXIDE G/KM 53.24 (51.13)
 OXIDES OF NITROGEN G/KM 2.25 (2.27)

VEHICLE EMISSIONS RESULTS RICH BEST IDLE

PROJECT 11-5830-004		PROJECT 11-5830-004		PROJECT 11-5830-004	
TEST NO. 731-4	RUN 1	VEHICLE NO. 73	DATE 12/18/80	TEST WEIGHT 1814. KG(4000. LBS)	
VEHICLE MODEL 70 CHEV MONTECARLO		BAG CART NO. 1	ACTUAL ROAD LOAD 8.9 KW(12.0 HP)	GASOLINE EM-433-F	
ENGINE 5.7 L(350. CID) V-8		DYNO NO. 3	ODOMETER ***** KM(86627. MILES)		
TRANSMISSION A3		CVS NO. 2			
BAROMETER 740.92 MM HG(29.17 IN HG)		DRY BULB TEMP. 25.6 DEG C(78.0 DEG F)		NOX HUMIDITY CORRECTION FACTOR .93	
RELATIVE HUMIDITY 40. PCT		ABS. HUMIDITY 8.3 GM/KG			
BAG RESULTS					
TEST CYCLE		SET	HFET		
BLOWER DIF P MM. H2O(IN. H2O)		767.1 (30.2)	774.7 (30.5)		
BLOWER INLET P MM. H2O(IN. H2O)		762.0 (30.0)	762.0 (30.0)		
BLOWER INLET TEMP. DEG. C(DEG. F)		42.8 (109.0)	43.3 (110.0)		
BLOWER REVOLUTIONS		111950.	61412.		
TOT FLOW STD. CU. METRES(SCF)		209.8 (7409.)	114.9 (4056.)		
HC SAMPLE METER/RANGE/PPM		31.3/ 3/ 315.	39.7/ 3/ 397.		
HC BCKGRD METER/RANGE/PPM		1.3/ 3/ 15.	1.7/ 3/ 17.		
CO SAMPLE METER/RANGE/PPM		62.6/ 3/ 1589.	46.4/ 3/ 1124.		
CO BCKGRD METER/RANGE/PPM		.6/ 3/ 14.	.3/ 3/ 7.		
CO2 SAMPLE METER/RANGE/PCT		83.9/ 3/ 1.55	44.1/ 2/ 1.92		
CO2 BCKGRD METER/RANGE/PCT		4.4/ 3/ .07	1.6/ 2/ .06		
NOX SAMPLE METER/RANGE/PPM		67.3/ 3/ 202.	29.7/ 4/ 297.		
NOX BCKGRD METER/RANGE/PPM		.4/ 3/ 1.	.1/ 4/ 1.		
DILUTION FACTOR		7.73	6.47		
HC CONCENTRATION PPM		302.	381.		
CO CONCENTRATION PPM		1510.	1062.		
CO2 CONCENTRATION PCT		1.49	1.88		
NOX CONCENTRATION PPM		200.9	296.2		
HC MASS GRAMS		36.33	25.35		
CO MASS GRAMS		368.78	142.07		
CO2 MASS GRAMS		5731.4	3947.0		
NOX MASS GRAMS		74.74	61.17		
RUN TIME	SECONDS	1397.	766.		
DFC, WET (DRY)		.871 (.859)	.845 (.834)		
SCF, WET (DRY)		1.000 (.973)	1.000 (.969)		
VOL (SCM)		209.8	114.9		
SAM BLR (SCM)		0.00	0.00		
KM (MEASURED)		21.81	16.51		
TEST NUMBER,		731-42	731-43		
BAROMETER,	MM HG	740.9	740.4		
HUMIDITY,	G/KG	8.3	8.8		
TEMPERATURE,	DEG C	25.6	26.1		
CARBON DIOXIDE,	G/KM	262.7	239.1		
FUEL CONSUMPTION,	L/100KM	12.58	10.99		
HYDROCARBONS,	G/KM	1.67	1.54		
CARBON MONOXIDE,	G/KM	16.91	8.61		
OXIDES OF NITROGEN,	G/KM	3.43	3.71		

TABLE D-20. TEST 732 EMISSIONS RESULTS

FTP

VEHICLE EMISSIONS RESULTS

PROJECT 11-5830-004

TEST NO. 732-1 RUN 1

VEHICLE MODEL 70 CHEV MONTECARLO

ENGINE 5.7 (350, CID) V-8

TRANSMISSION A3

VEHICLE NO. 73

DATE 11/12/80

BAG CART NO. 1

DYNO NO. 3

CVS NO. 2

TEST WEIGHT 1814. KG (4000, LBS)

ACTUAL ROAD LOAD 8.9 MW (12.0 HP)

GASOLINE EM-433-F

ODOMETER ***** KM (B6627, MILES)

BAROMETER 744.47 MM HG (29.31 IN HG)

RELATIVE HUMIDITY 44. PCT

BAG RESULTS

DRY BULB TEMP. 26.1 DEG C (79.0 DEG F)

ABS. HUMIDITY 9.4 GW/KG

NOX HUMIDITY CORRECTION FACTOR .96

BAG NUMBER DESCRIPTION	1 COLD TRANSIENT		2 STABILIZED		3 HOT TRANSIENT		4 STABILIZED	
	BLOWER DIF P MM. H2O (IN. H2O)	749.3 (29.5)	749.3 (29.5)	749.3 (29.5)	749.3 (29.5)	749.3 (29.5)	749.3 (29.5)	749.3 (29.5)
BLOWER INLET P MM. H2O (IN. H2O)	749.3 (29.5)	749.3 (29.5)	749.3 (29.5)	749.3 (29.5)	749.3 (29.5)	749.3 (29.5)	749.3 (29.5)	
BLOWER INLET TEMP. DEG. C (DEG. F)	43.9 (111.0)	43.3 (110.0)	43.3 (110.0)	43.3 (110.0)	43.3 (110.0)	43.3 (110.0)	43.3 (110.0)	
BLOWER REVOLUTIONS	40544.	40544.	40544.	40544.	40544.	40544.	40544.	
TOT FLOW STD. CU. METRES (SCF)	76.4 (2698.)	131.5 (4642.)	76.3 (2695.)	131.4 (4639.)	76.3 (2695.)	131.4 (4639.)	76.3 (2695.)	
HC SAMPLE METER/RANGE/PPM	31.3/ 3/ 313.	14.0/ 3/ 140.	22.8/ 3/ 228.	14.2/ 3/ 142.	22.8/ 3/ 228.	14.2/ 3/ 142.	22.8/ 3/ 228.	
HC BCKGRD METER/RANGE/PPM	1.3/ 3/ 13.	1.3/ 3/ 13.	1.4/ 3/ 14.	1.5/ 3/ 15.	1.4/ 3/ 14.	1.5/ 3/ 15.	1.4/ 3/ 14.	
CO SAMPLE METER/RANGE/PPM	58.3/ 2/ 2933.	77.4/ 1/ 344.	95.4/ 1/ 490.	24.7/ 3/ 572.	95.4/ 1/ 490.	24.7/ 3/ 572.	95.4/ 1/ 490.	
CO BCKGRD METER/RANGE/PPM	1.2/ 2/ 4.	1.8/ 1/ 5.	1.3/ 1/ 4.	1.7/ 3/ 2.	1.3/ 1/ 4.	1.7/ 3/ 2.	1.3/ 1/ 4.	
CO2 SAMPLE METER/RANGE/PCT	92.7/ 3/ 1.73	65.9/ 3/ 1.18	85.2/ 3/ 1.58	63.7/ 3/ 1.14	85.2/ 3/ 1.58	63.7/ 3/ 1.14	85.2/ 3/ 1.58	
CO2 BCKGRD METER/RANGE/PCT	3.8/ 3/ .06	3.8/ 3/ .06	3.5/ 3/ .05	3.8/ 3/ .06	3.5/ 3/ .05	3.8/ 3/ .06	3.5/ 3/ .05	
NOX SAMPLE METER/RANGE/PPM	74.4/ 2/ 74.	31.4/ 2/ 31.	73.6/ 2/ 74.	30.0/ 2/ 30.	73.6/ 2/ 74.	30.0/ 2/ 30.	73.6/ 2/ 74.	
NOX BCKGRD METER/RANGE/PPM	.8/ 2/ 1.	1.1/ 2/ 1.	.9/ 2/ 1.	1.1/ 2/ 1.	.9/ 2/ 1.	1.1/ 2/ 1.	.9/ 2/ 1.	
DILUTION FACTOR	6.55	10.91	8.13	11.09	8.13	11.09	8.13	
HC CONCENTRATION PPM	302.	128.	216.	149.	216.	149.	216.	
CO CONCENTRATION PPM	2790.	326.	465.	548.	465.	548.	465.	
CO2 CONCENTRATION PCT	1.69	1.13	1.53	1.08	1.53	1.08	1.53	
NOX CONCENTRATION PPM	73.7.	30.4.	72.8.	29.0.	72.8.	29.0.	72.8.	
HC MASS GRAMS	13.31	9.22	9.49	11.24	9.49	11.24	9.49	
CO MASS GRAMS	248.20	49.66	41.35	84.04	41.35	84.04	41.35	
CO2 MASS GRAMS	2358.0	2715.6	2139.3	2607.0	2139.3	2607.0	2139.3	
NOX MASS GRAMS	10.33	7.33	10.19	6.98	10.19	6.98	10.19	
HC GRAMS/KM	2.29	1.55	1.64	1.81	1.64	1.81	1.64	
CO GRAMS/KM	42.71	7.96	7.16	13.53	7.16	13.53	7.16	
CO2 GRAMS/KM	405.8	432.7	370.3	419.6	370.3	419.6	370.3	
NOX GRAMS/KM	1.78	1.17	1.76	1.12	1.76	1.12	1.76	
FUEL CONSUMPTION BY CB L/100KM	20.49	19.21	16.51	19.06	16.51	19.06	16.51	
RUN TIME	504.	868.	504.	868.	504.	868.	504.	
MEASURED DISTANCE KM	5.81	6.28	5.78	6.21	5.78	6.21	5.78	
D/C, WET (DRY)		.886 (.873)		.898 (.885)		.898 (.885)		
SCF, WET (DRY)		1.000 (.973)		1.000 (.974)		1.000 (.974)		
VOL. (SCM)		207.9		207.7		207.7		
SAM BLR. (SCM)		0.00		0.00		0.00		
KM (MEASURED)		12.09		11.99		11.99		
FUEL CONSUMPTION L/100KM		19.83		17.83		17.83		

COMPOSITE RESULTS

TEST NUMBER 732-11

BAROMETER MM HG 744.5

HUMIDITY G/KG 9.4

TEMPERATURE DEG C 26.1

CARBON DIOXIDE G/KM 410.1

FUEL CONSUMPTION L/100KM 18.74

HYDROCARBONS (THC) G/KM 1.73

CARBON MONOXIDE G/KM 14.73

OXIDES OF NITROGEN G/KM 1.46

3-BAG (4-BAG)

410.1 (405.1)

18.74 (18.59)

1.73 (1.80)

14.73 (14.57)

1.46 (1.44)

VEHICLE EMISSIONS RESULTS		W/O VAC. ADVANCE	
PROJECT 11-5830-004			
TEST NO. 732-1	RUN 1	VEHICLE NO. 73	TEST WEIGHT 1814. KG (4000. LBS)
VEHICLE MODEL 70 CHEV MONTECARLO		DATE 11/12/80	ACTUAL ROAD LOAD 8.9 KW (12.0 HP)
ENGINE 5.7 L (350. CID) V-8		BAFE CART NO. 1	GASOLINE EM-433-F
TRANSMISSION A3		DYNO NO. 1	ODOMETER ***** KM(86627, MILES)
		CVS NO. 2	
BAROMETER 743.97 MM HG(29.29 IN HG)		DRY BULB TEMP. 26.7 DEG C(80.0 DEG F)	
RELATIVE HUMIDITY 44, PCT		ABS. HUMIDITY 9.9 GR/KG	
BAD RESULTS		NOX HUMIDITY CORRECTION FACTOR .97	
TEST CYCLE		SET	HFET
BLOWER DIF P MM, H2O(IN, H2O)		762.0 (30.0)	762.0 (30.0)
BLOWER INLET P MM, H2O(IN, H2O)		762.0 (30.0)	762.0 (30.0)
BLOWER INLET TEMP. DEG. C(DEG. F)		43.3 (110.0)	43.3 (110.0)
BLOWER REVOLUTIONS		112056	61411
TOT FLOW STD. CU. METRES (SCF)		210.8 (7444.4)	115.5 (4078.1)
HC SAMPLE METER/RANGE/PPM		20.2/ 3/ 202.	18.2/ 3/ 182.
HC BCKGRD METER/RANGE/PPM		1.6/ 3/ 16.	1.4/ 3/ 14.
CO SAMPLE METER/RANGE/PPM		94.1/11/ 478.	24.7/ 2/ 247.
CO BCKGRD METER/RANGE/PPM		1.1/11/ 3.	1.1/ 3/ 2.
CO2 SAMPLE METER/RANGE/PCT		95.0/ 3/ 1.78	50.7/ 2/ 2.28
CO2 BCKGRD METER/RANGE/PCT		3.9/ 3/ .06	1.8/ 2/ .06
NOX SAMPLE METER/RANGE/PPM		87.9/ 2/ 88.	42.6/ 3/ 128.
NOX BCKGRD METER/RANGE/PPM		1.1/ 2/ 1.	.2/ 3/ 1.
DILUTION FACTOR		7.25	5.70
HC CONCENTRATION PPM		188.	170.
CO CONCENTRATION PPM		452.	541.
CO2 CONCENTRATION PCT		1.73	2.22
NOX CONCENTRATION PPM		87.0	127.3
HC MASS GRAMS		22.88	11.35
CO MASS GRAMS		110.99	72.81
CO2 MASS GRAMS		6683.9	4704.5
NOX MASS GRAMS		34.11	27.36
RUN TIME		1398.	766.
SECOUNDS		1862 (.850)	.825 (.813)
DPC, WET (DRY)		1.000 (.929)	1.000 (.965)
SCF, WET (DRY)			
VOL (SCM)		210.8	115.5
SAM BLK (SCM)		0.00	0.00
KM (MEASURED)		21.83	16.41
TEST NUMBER,		732-12	732-13
BAROMETER, MM HG		744.0	743.7
HUMIDITY, G/KG		9.9	9.9
TEMPERATURE, DEG C		26.7	26.7
CARBON DIOXIDE, G/KM		306.2	286.7
FUEL CONSUMPTION, L/100KM		13.55	12.63
HYDROCARBONS, G/KM		1.05	.69
CARBON MONOXIDE, G/KM		5.08	4.44
OXIDES OF NITROGEN, G/KM		1.56	1.67

TABLE D-21. TEST 732 EMISSIONS RESULTS

FTP VEHICLE EMISSIONS RESULTS		12% IGN. MISFIRE W/O VAC. ADV.	
PROJECT 11-5830-004			
TEST NO. 732-2	RUN 1	VEHICLE NO. 73	TEST WEIGHT 1814, KG (4000, LBS)
VEHICLE MODEL 70 CHEV MONTECARLO		DATE 11/13/80	ACTUAL ROAD LOAD 8.9 KW (12.0 HP)
ENGINE 5.7 L(350, CID) V-8		BAG CART NO. 1	GASOLINE EM-433-F
TRANSMISSION A3		DYNO NO. 3	ODOMETER 0, KM(0, MILES)
		CVS NO. 2	
BAROMETER 741.68 MM HG(29.20 IN HG)		DRY BULB TEMP. 24.1 DEG C(79.0 DEG F)	
RELATIVE HUMIDITY 34, PCT		ABS. HUMIDITY 7.4 GM/KG	NOX HUMIDITY CORRECTION FACTOR .90
BAG RESULTS			
BAG NUMBER	1	2	3
DESCRIPTION	COLD TRANSIENT	STABILIZED	HOT TRANSIENT
BLOWER DIF P MM, H2O(IN, H2O)	749.3 (29.5)	749.3 (29.5)	749.3 (29.5)
BLOWER INLET P MM, H2O(IN, H2O)	749.3 (29.5)	749.3 (29.5)	749.3 (29.5)
BLOWER INLET TEMP, DEG. C(DEG. F)	43.3 (110.0)	42.8 (109.0)	42.8 (109.0)
BLOWER REVOLUTIONS	40841	8702	8523
TOT FLOW STD, CU. METRES(SCF)	76.4 (2696.)	131.1 (4628.)	76.2 (2691.)
HC SAMPLE METER/RANGE/PPM	21.5/ 4/2150.	11.8/ 4/1180.	16.2/ 4/1620.
HC BCKGRD METER/RANGE/PPM	.2/ 4/ 20.	.3/ 4/ 30.	.3/ 4/ 30.
CO SAMPLE METER/RANGE/PPM	93.9/ 3/2687.	74.4/11/ 323.	93.8/11/ 475.
CO BCKGRD METER/RANGE/PPM	.1/ 3/ 2.	1.4/11/ 4.	1.3/11/ 4.
CO2 SAMPLE METER/RANGE/PCT	87.9/ 3/ 1.63	60.8/ 3/ 1.08	81.8/ 3/ 1.51
CO2 BCKGRD METER/RANGE/PCT	3.4/ 3/ .05	3.5/ 3/ .05	4.2/ 3/ .07
NOX SAMPLE METER/RANGE/PPM	95.1/ 2/ 95.	45.1/ 2/ 45.	97.9/ 2/ 98.
NOX BCKGRD METER/RANGE/PPM	1.6/ 2/ 2.	1.5/ 2/ 2.	1.3/ 2/ 1.
DILUTION FACTOR	6.36	10.91	7.81
HC CONCENTRATION PPM	2133.	1153.	1594.
CO CONCENTRATION PPM	2371.	309.	453.
CO2 CONCENTRATION PCT	1.59	1.03	1.44
NOX CONCENTRATION PPM	93.8	43.7	96.8
HC MASS GRAMS	93.92	87.12	70.04
CO MASS GRAMS	228.51	47.20	40.20
CO2 MASS GRAMS	2225.0	2472.1	2014.8
NOX MASS GRAMS	12.35	9.89	12.72
HC GRAMS/KM	16.11	13.83	11.98
CO GRAMS/KM	39.19	7.49	6.88
CO2 GRAMS/KM	381.6	392.3	344.8
NOX GRAMS/KM	2.12	1.57	2.18
FUEL CONSUMPTION BY CB L/100KM	21.10	19.12	16.80
MEASURED DISTANCE KM	505.	867.	505.
DFC, WET (DRY)	5.83	6.30	5.84
SCF, WET (DRY)	.884 (.874)		.893 (.883)
VOL (SCH)	1.000 (.977)		1.000 (.977)
SAM BLR (SCH)	207.4		207.1
KM (MEASURED)	0.00		0.00
FUEL CONSUMPTION L/100KM	12.13		12.14
	20.07		17.97
COMPOSITE RESULTS			
TEST NUMBER 732-21		CARBON DIOXIDE G/KM	3-BAG 377.0 (376.8)
BAROMETER MM HG 741.7		FUEL CONSUMPTION L/100KM	18.89 (18.87)
HUMIDITY G/KG 7.4		HYDROCARBONS (THC) G/KM	13.79 (13.79)
TEMPERATURE DEG C 26.1		CARBON MONOXIDE G/KM	13.87 (13.82)
		OXIDES OF NITROGEN G/KM	1.85 (1.86)

VEHICLE EMISSIONS RESULTS - 12% IGN. MISFIRE W/O VAC. ADV.
PROJECT 11-5830-004

TEST NO. 732-2	RUN 1	VEHICLE NO. 73	TEST WEIGHT 1814, KG (4000, LBS)
VEHICLE MODEL 70 CHEV MONTECARLO		DATE 11/13/80	ACTUAL ROAD LOAD 8.9 KW (12.0 HP)
ENGINE 5.7 L(350, CID) V-8		BAG CART NO. 1	GASOLINE EM-433-F
TRANSMISSION A3		DYNO NO. 3	ODOMETER 0, KM(0, MILES)
		CVS NO. 2	
BAROMETER 740.92 MM HG(29.17 IN HG)		DRY BULB TEMP. 23.9 DEG C(75.0 DEG F)	
RELATIVE HUMIDITY 38, PCT		ABS. HUMIDITY 7.1 GM/KG	NOX HUMIDITY CORRECTION FACTOR .89
BAG RESULTS			
TEST CYCLE	SET	HFET	
BLOWER DIF P MM, H2O(IN, H2O)	762.0 (30.0)	749.3 (29.5)	
BLOWER INLET P MM, H2O(IN, H2O)	762.0 (30.0)	749.3 (29.5)	
BLOWER INLET TEMP, DEG. C(DEG. F)	43.3 (110.0)	43.3 (110.0)	
BLOWER REVOLUTIONS	112130.	81425.	
TOT FLOW STD, CU. METRES(SCF)	210.0 (7416.)	115.2 (4068.)	
HC SAMPLE METER/RANGE/PPM	17.5/ 4/1750.	21.8/ 4/2180.	
HC BCKGRD METER/RANGE/PPM	.2/ 4/ 20.	.2/ 4/ 20.	
CO SAMPLE METER/RANGE/PPM	96.3/11/ 499.	25.7/ 3/ 596.	
CO BCKGRD METER/RANGE/PPM	.7/11/ 2.	.1/ 3/ 2.	
CO2 SAMPLE METER/RANGE/PCT	89.1/ 3/ 1.66	47.7/ 2/ 2.11	
CO2 BCKGRD METER/RANGE/PCT	3.4/ 3/ .06	1.2/ 2/ .04	
NOX SAMPLE METER/RANGE/PPM	37.4/ 3/ 113.	55.7/ 3/ 167.	
NOX BCKGRD METER/RANGE/PPM	.2/ 3/ 1.	.3/ 3/ 1.	
DILUTION FACTOR	7.12	5.61	
HC CONCENTRATION PPM	1733.	2164.	
CO CONCENTRATION PPM	475.	564.	
CO2 CONCENTRATION PCT	1.61	2.08	
NOX CONCENTRATION PPM	112.3	166.4	
HC MASS GRAMS	209.84	143.74	
CO MASS GRAMS	116.20	75.63	
CO2 MASS GRAMS	8198.0	4387.4	
NOX MASS GRAMS	40.31	76.85	
RUN TIME SECONDS	1397.	766.	
DFC, WET (DRY)	.860 (.849)	.822 (.813)	
SCF, WET (DRY)	1.000 (.972)	1.000 (.970)	
VOL (SCH)	210.0	115.2	
SAM BLR (SCH)	0.00	0.00	
KM (MEASURED)	21.74	16.54	
TEST NUMBER, 732-22		732-23	
BAROMETER, MM HG 740.9		740.7	
HUMIDITY, G/KG 7.1		7.2	
TEMPERATURE, DEG C 23.9		26.7	
CARBON DIOXIDE, G/KM 285.1		265.3	
FUEL CONSUMPTION, L/100KM 13.84		12.81	
HYDROCARBONS, G/KM 9.65		8.69	
CARBON MONOXIDE, G/KM 5.35		4.57	
OXIDES OF NITROGEN, G/KM 1.85		1.99	

TABLE D-22. TEST 732 EMISSIONS RESULTS

FTP VEHICLE EMISSIONS RESULTS 12% IGN. MISFIRE W/O VAC. ADV.

PROJECT 11-5830-004

TEST NO. 732-3	RUN 1	VEHICLE NO. 73	TEST WEIGHT 1814. KG (4000. LBS)	
VEHICLE MODEL 70 CHEV MONTECARLO		DATE 11/14/80	ACTUAL ROAD LOAD 8.9 NM (12.0 HP)	
ENGINE 5.7 L (350. CID) V-8		BAG CART NO. 1	GASOLINE EM-433-F	
TRANSMISSION A3		DYNO NO. 3	ODOMETER 0. KM (0. MILES)	
CVS NO. 2				
BAROMETER 740.16 MM HG (29.14 IN HG)		DRY BULB TEMP. 25.6 DEG C (78.0 DEG F)	NOX HUMIDITY CORRECTION FACTOR 1.04	
RELATIVE HUMIDITY 57. PCT		ABS. HUMIDITY 11.9 GM/KG		
BAG RESULTS				
BAG NUMBER				
DESCRIPTION	1	2	3	
	COLD TRANSIENT	STABILIZED	HOT TRANSIENT	
			STABILIZED	
BLOWER DIF P MM. H2O (IN. H2O)	736.6 (29.0)	762.0 (30.0)	736.6 (29.0)	762.0 (30.0)
BLOWER INLET P MM. H2O (IN. H2O)	736.6 (29.0)	762.0 (30.0)	736.6 (29.0)	762.0 (30.0)
BLOWER INLET TEMP. DEG. C (DEG. F)	43.3 (110.0)	43.3 (110.0)	42.8 (109.0)	42.8 (109.0)
BLOWER REVOLUTIONS	40424	67592	40454	67513
TOT FLOW STD. CU. METRES (SCF)	75.9 (2680.)	130.2 (4597.)	76.0 (2685.)	130.2 (4594.)
HC SAMPLE METER/RANGE/PPM	23.6/ 4/2360.	12.1/ 4/1210.	16.5/ 4/1650.	11.7/ 4/1170.
HC BCKGRD METER/RANGE/PPM	1/ 4/ 10.	2/ 4/ 20.	1/ 4/ 10.	3/ 4/ 30.
CO SAMPLE METER/RANGE/PPM	97.3/ 3/2827.	72.4/11/ 310.	90.4/11/ 445.	65.0/11/ 285.
CO BCKGRD METER/RANGE/PPM	3/ 3/ 7.	1.5/11/ 4.	1.2/11/ 3.	1.2/11/ 3.
CO2 SAMPLE METER/RANGE/PCT	91.4/ 3/ 1.71	63.0/ 3/ 1.12	82.7/ 3/ 1.53	61.9/ 3/ 1.10
CO2 BCKGRD METER/RANGE/PCT	3.5/ 3/ .05	3.7/ 3/ .06	3.6/ 3/ .06	3.9/ 3/ .06
NOX SAMPLE METER/RANGE/PPM	85.6/ 2/ 86.	40.9/ 2/ 41.	91.2/ 3/ 91.	42.5/ 2/ 43.
NOX BCKGRD METER/RANGE/PPM	5.2/ 2/ 1.	5.2/ 2/ 1.	6.2/ 2/ 1.	9.2/ 2/ 1.
DILUTION FACTOR	6.06	10.52	7.73	10.78
HC CONCENTRATION PPM	2352.	1192.	1641.	1143.
CO CONCENTRATION PPM	2677.	294.	421.	251.
CO2 CONCENTRATION PCT	1.66	1.07	1.48	1.05
NOX CONCENTRATION PPM	85.2	40.4	90.7	41.7
HC MASS GRAMS	102.93	89.48	71.96	85.77
CO MASS GRAMS	236.58	44.54	37.25	38.03
CO2 MASS GRAMS	2310.9	2553.9	2057.1	2494.0
NOX MASS GRAMS	12.86	10.48	13.72	10.79
HC GRAMS/KM	17.37	14.14	12.26	13.55
CO GRAMS/KM	39.92	7.04	6.34	5.01
CO2 GRAMS/KM	389.9	403.5	350.3	394.0
NOX GRAMS/KM	2.17	1.66	2.34	1.71
FUEL CONSUMPTION BY CB L/100KM	21.67	19.61	17.04	19.05
RUN TIME	504.	868.	504.	867.
MEASURED DISTANCE	5.93	6.33	5.87	6.33
DFC, WET (DRY)		.879 (.863)		.894 (.877)
SCF, WET (DRY)		1.000 (.969)		1.000 (.970)
VOL (SCH)		206.1		206.2
SAM BLR (SCH)		0.00		0.00
KM (MEASURED)		12.26		12.20
FUEL CONSUMPTION L/100KM		20.61		18.09

COMPOSITE RESULTS

TEST NUMBER	732-31		3-BAG	(4-BAG)
BAROMETER	MM HG 740.2		CARBON DIOXIDE	G/KM 386.1 (383.3)
HUMIDITY	G/KG 11.9		FUEL CONSUMPTION	L/100KM 19.33 (19.17)
TEMPERATURE	DEG C 25.6		HYDROCARBONS (THC)	G/KM 14.29 (14.12)
			CARBON MONOXIDE	G/KM 13.28 (13.18)
			OXIDES OF NITROGEN	G/KM 1.95 (1.96)

VEHICLE EMISSIONS RESULTS 12% IGN. MISFIRE W/O VAC. ADV.
PROJECT 11-5830-004

TEST NO. 732-3	RUN 1	VEHICLE NO. 73	TEST WEIGHT 1814. KG (4000. LBS)
VEHICLE MODEL 70 CHEV MONTECARLO		DATE 11/14/80	ACTUAL ROAD LOAD 8.9 NM (12.0 HP)
ENGINE 5.7 L (350. CID) V-8		BAG CART NO. 1	GASOLINE EM-433-F
TRANSMISSION A3		DYNO NO. 3	ODOMETER ***** NM (86627. MILES)
CVS NO. 2			
BAROMETER 739.90 MM HG (29.13 IN HG)		DRY BULB TEMP. 26.1 DEG C (79.0 DEG F)	NOX HUMIDITY CORRECTION FACTOR .98
RELATIVE HUMIDITY 47. PCT		ABS. HUMIDITY 10.2 GM/KG	
BAG RESULTS			
TEST CYCLE		SET	HFET
BLOWER DIF P MM. H2O (IN. H2O)		762.0 (30.0)	774.7 (30.5)
BLOWER INLET P MM. H2O (IN. H2O)		762.0 (30.0)	774.7 (30.5)
BLOWER INLET TEMP. DEG. C (DEG. F)		42.8 (109.0)	43.3 (110.0)
BLOWER REVOLUTIONS		112013	61335
TOT FLOW STD. CU. METRES (SCF)		209.7 (7404.)	114.4 (4041.)
HC SAMPLE METER/RANGE/PPM		18.4/ 4/1840.	21.7/ 4/2170.
HC BCKGRD METER/RANGE/PPM		2/ 4/ 20.	4/ 4/ 40.
CO SAMPLE METER/RANGE/PPM		94.9/11/ 486.	26.0/ 3/ 603.
CO BCKGRD METER/RANGE/PPM		8/11/ 2.	12/ 3/ 5.
CO2 SAMPLE METER/RANGE/PCT		93.1/ 3/ 1.74	48.4/ 2/ 2.15
CO2 BCKGRD METER/RANGE/PCT		3.1/ 3/ .05	1.5/ 2/ .05
NOX SAMPLE METER/RANGE/PPM		37.0/ 3/ 11.	46.0/ 3/ 138.
NOX BCKGRD METER/RANGE/PPM		4/ 3/ 1.	5/ 3/ 2.
DILUTION FACTOR		6.79	5.52
HC CONCENTRATION PPM		1823.	2137.
CO CONCENTRATION PPM		460.	566.
CO2 CONCENTRATION PCT		1.70	2.11
NOX CONCENTRATION PPM		110.0	136.8
HC MASS GRAMS		220.40	141.04
CO MASS GRAMS		112.29	75.41
CO2 MASS GRAMS		6536.8	4418.7
NOX MASS GRAMS		43.35	29.66
RUN TIME	SECONDS	1398.	766.
DFC, WET (DRY)		.853 (.840)	.819 (.807)
SCF, WET (DRY)		1.000 (.969)	1.000 (.966)
VOL (SCH)		209.7	114.4
SAM BLR (SCH)		0.00	0.00
KM (MEASURED)		21.90	18.57
TEST NUMBER,	732-32	732-33	
BAROMETER,	MM HG 739.9	739.4	
HUMIDITY,	G/KG 10.2	10.9	
TEMPERATURE,	DEG C 26.1	27.2	
CARBON DIOXIDE,	G/KM 298.4	266.7	
FUEL CONSUMPTION,	L/100KM 14.44	12.84	
HYDROCARBONS,	G/KM 10.06	8.51	
CARBON MONOXIDE,	G/KM 5.13	4.55	
OXIDES OF NITROGEN,	G/KM 1.98	1.79	

TABLE D-23. TEST 7 EMISSIONS RESULTS

FTP VEHICLE EMISSIONS RESULTS, UNMODIFIED
PROJECT 11-5830-004

TEST NO. 733-1 RUN 1
VEHICLE MODEL 70 CHEV MONTECARLO
ENGINE 5.7 L(350, CID) V-8
TRANSMISSION A3

VEHICLE NO.73
DATE 12/19/80
BAG CART NO. 1
DYNO NO. 3
CVS NO. 2

TEST WEIGHT 1814. KG(4000, LBS)
ACTUAL ROAD LOAD 8.9 KW(12.0 HP)
GASOLINE EM-433-F
ODOMETER ***** KM(86627, MILES)

BAROMETER 748.03 MM HG(29.45 IN HG)
RELATIVE HUMIDITY 29. PCT

DRY BULB TEMP. 24.4 DEG C(76.0 DEG F)
ABS. HUMIDITY 5.5 GR/KG

NOX HUMIDITY CORRECTION FACTOR .85

BAG RESULTS
BAG NUMBER
DESCRIPTION
BLOWER DIF P MM, H2O(IN, H2O)
BLOWER INLET P MM, H2O(IN, H2O)
BLOWER INLET TEMP, DEG. C(DEG. F)
BLOWER REVOLUTIONS
TOT FLOW STD. CU. METRES(SCF)
HC SAMPLE METER/RANGE/PPM
HC BCKGRD METER/RANGE/PPM
CO SAMPLE METER/RANGE/PPM
CO BCKGRD METER/RANGE/PPM
CO2 SAMPLE METER/RANGE/PCT
CO2 BCKGRD METER/RANGE/PCT
NOX SAMPLE METER/RANGE/PPM
NOX BCKGRD METER/RANGE/PPM
DILUTION FACTOR
HC CONCENTRATION PPM
CO CONCENTRATION PPM
CO2 CONCENTRATION PCT
NOX CONCENTRATION PPM
HC MASS GRAMS
CO MASS GRAMS
CO2 MASS GRAMS
NOX MASS GRAMS
HC GRAMS/KM
CO GRAMS/KM
CO2 GRAMS/KM
NOX GRAMS/KM
FUEL CONSUMPTION BY CB L/100KM

	1 COLD TRANSIENT	2 STABILIZED	3 HOT TRANSIENT	4 STABILIZED
742.0 (30.0)	742.0 (30.0)	742.0 (30.0)	747.1 (30.2)	
749.3 (29.5)	749.3 (29.5)	749.3 (29.5)	756.9 (29.8)	
42.8 (109.0)	43.1 (109.5)	43.3 (110.0)	43.3 (110.0)	
40582.	69587.	40458.	69468.	
77.0 (2719.)	132.0 (4660.)	76.7 (2708.)	131.5 (4645.)	
50.5/ 3/ 505.	14.8/ 3/ 148.	21.1/ 3/ 211.	13.8/ 3/ 138.	
9.3/ 3/ 9.	1.9/ 3/ 8.	1.8/ 3/ 8.	8/ 3/ 8.	
81.1/ 2/ 4712.	63.4/ 11/ 235.	77.9/ 11/ 347.	78.3/ 12/ 184.	
1.1/ 2/ 4.	.8/ 11/ 2.	.1/ 11/ 0.	.2/ 12/ 0.	
85.5/ 3/ 1.58	60.7/ 3/ 1.08	76.4/ 3/ 1.40	58.6/ 3/ 1.04	
2.8/ 3/ .04	1.0/ 3/ .05	2.3/ 3/ .04	2.2/ 3/ .03	
50.5/ 3/ 152.	58.8/ 2/ 39.	49.3/ 3/ 148.	55.6/ 2/ 56.	
.2/ 3/ 1.	.8/ 2/ 1.	.2/ 3/ 1.	.6/ 2/ 1.	
6.42	12.00	9.24	12.56	
497.	140.	204.	131.	
4522.	246.	334.	178.	
1.55	1.03	1.36	1.08	
151.0	38.1	147.4	55.0	
22.08	10.63	9.01	9.91	
405.33	37.72	29.86	27.28	
2180.3	2500.0	1911.1	2418.5	
19.00	12.52	18.47	11.83	
3.78	1.69	1.55	1.59	
69.38	4.00	5.15	4.37	
373.2	398.0	329.4	387.8	
3.25	1.99	3.18	1.90	
21.10	17.62	14.62	17.06	

RUN TIME SECONDS
MEASURED DISTANCE KM
D/C, WET (DRY)
SCF, WET (DRY)
VOL (SCM)
SAM BLR (SCM)
KM (MEASURED)
FUEL CONSUMPTION L/100KM

	505.	867.	504.	866.
5.84	6.28	5.80	6.24	
.890 (.882)		.910 (.901)		
1.000 (.979)		1.000 (.980)		
209.0		208.2		
0.00		0.00		
12.12		12.04		
19.30		15.88		

COMPOSITE RESULTS

TEST NUMBER 733-11
BAROMETER MM HG 748.0
HUMIDITY G/KG 5.5
TEMPERATURE DEG C 24.4

CARBON DIOXIDE G/KM 374.1 (371.0)
FUEL CONSUMPTION L/100KM 17.55 (17.35)
HYDROCARBONS (THC) G/KM 2.09 (2.06)
CARBON MONOXIDE G/KM 18.90 (18.42)
OXIDES OF NITROGEN G/KM 2.58 (2.55)

VEHICLE EMISSIONS RESULTS - UNMODIFIED PROJECT 11-5830-004

TEST NO. 733-1 RUN 1
VEHICLE MODEL 70 CHEV MONTECARLO
ENGINE 5.7 L(350, CID) V-8
TRANSMISSION A3

VEHICLE NO.73
DATE 12/19/80
BAG CART NO. 1
DYNO NO. 3
CVS NO. 2

TEST WEIGHT 1814. KG(4000, LBS)
ACTUAL ROAD LOAD 8.9 KW(12.0 HP)
GASOLINE EM-433-F
ODOMETER ***** KM(86627, MILES)

BAROMETER 749.30 MM HG(29.50 IN HG)
RELATIVE HUMIDITY 27. PCT

DRY BULB TEMP. 25.0 DEG C(77.0 DEG F)
ABS. HUMIDITY 5.3 GR/KG

NOX HUMIDITY CORRECTION FACTOR .85

BAG RESULTS
TEST CYCLE
BLOWER DIF P MM, H2O(IN, H2O)
BLOWER INLET P MM, H2O(IN, H2O)
BLOWER INLET TEMP, DEG. C(DEG. F)
BLOWER REVOLUTIONS
TOT FLOW STD. CU. METRES(SCF)
HC SAMPLE METER/RANGE/PPM
HC BCKGRD METER/RANGE/PPM
CO SAMPLE METER/RANGE/PPM
CO BCKGRD METER/RANGE/PPM
CO2 SAMPLE METER/RANGE/PCT
CO2 BCKGRD METER/RANGE/PCT
NOX SAMPLE METER/RANGE/PPM
NOX BCKGRD METER/RANGE/PPM
DILUTION FACTOR
HC CONCENTRATION PPM
CO CONCENTRATION PPM
CO2 CONCENTRATION PCT
NOX CONCENTRATION PPM
HC MASS GRAMS
CO MASS GRAMS
CO2 MASS GRAMS
NOX MASS GRAMS
RUN TIME SECONDS
D/C, WET (DRY)
SCF, WET (DRY)
VOL (SCM)
SAM BLR (SCM)
KM (MEASURED)

	SET	HFET
774.7 (30.5)	762.0 (30.0)	762.0 (30.0)
762.0 (30.0)	749.3 (29.5)	749.3 (29.5)
43.3 (110.0)	43.3 (110.0)	43.3 (110.0)
111973.	61314.	61314.
212.2 (7494.)	116.4 (4109.)	116.4 (4109.)
21.8/ 3/ 218.	31.5/ 3/ 315.	31.5/ 3/ 315.
1.0/ 3/ 10.	1.2/ 3/ 12.	1.2/ 3/ 12.
88.1/ 11/ 428.	27.5/ 3/ 640.	27.5/ 3/ 640.
1.1/ 11/ 0.	.1/ 3/ 2.	.1/ 3/ 2.
85.6/ 3/ 1.59	44.1/ 2/ 1.92	44.1/ 2/ 1.92
3.0/ 3/ .05	1.5/ 2/ .05	1.5/ 2/ .05
66.8/ 3/ 200.	31.2/ 4/ 312.	31.2/ 4/ 312.
.4/ 3/ 1.	.1/ 4/ 1.	.1/ 4/ 1.
8.13	6.64	6.64
209.	305.	305.
409.	409.	409.
1.55	1.88	1.88
199.3	311.2	311.2
25.60	20.45	20.45
100.96	82.57	82.57
6006.9	4004.5	4004.5
68.65	59.47	59.47
1397.	765.	765.
.877 (.869)	.849 (.843)	.849 (.843)
1.000 (.977)	1.000 (.975)	1.000 (.975)
212.	116.4	116.4
0.00	0.00	0.00
21.66	16.46	16.46

TEST NUMBER, 733-12
BAROMETER, MM HG 749.3
HUMIDITY, G/KG 5.3
TEMPERATURE, DEG C 25.0
CARBON DIOXIDE, G/KM 277.3
FUEL CONSUMPTION, L/100KM 12.31
HYDROCARBONS, G/KM 1.18
CARBON MONOXIDE, G/KM 4.66
OXIDES OF NITROGEN, G/KM 3.17

733-13
749.0
5.7
28.3
243.3
10.89
1.24
5.02
3.61

TABLE D-24. TEST 731 EMISSIONS RESULTS

FTP VEHICLE EMISSIONS RESULTS - RICH BEST IDLE W/O VAC. ADV. PROJECT 11-5830-004		VEHICLE NO.73 DATE 12/ 8/80 BAG CART NO. 1 DYNO NO. 3 CVS NO. 2		TEST WEIGHT 1814. KG(4000. LBS) ACTUAL ROAD LOAD 8.9 KW(12.0 HP) GASOLINE EM-433 F ODOMETER ***** KM(86627. MILES)	
TEST NO. 731-2 RUN 1 VEHICLE MODEL 70 CHEV MONTECARLO ENGINE 5.7 L(350. CID) V-8 TRANSMISSION A3		VEHICLE NO.73 DATE 12/ 8/80 BAG CART NO. 1 DYNO NO. 3 CVS NO. 2		TEST WEIGHT 1814. KG(4000. LBS) ACTUAL ROAD LOAD 8.9 KW(12.0 HP) GASOLINE EM-433 F ODOMETER ***** KM(86627. MILES)	
BAROMETER 737.11 MM HG(29.02 IN HG) RELATIVE HUMIDITY 62. PCT BAG RESULTS		DRY BULB TEMP. 27.8 DEG C(82.0 DEG F) ABS. HUMIDITY 15.0 GM/KG		NOX HUMIDITY CORRECTION FACTOR 1.16	
BAG NUMBER DESCRIPTION		1 COLD TRANSIENT		2 STABILIZED	
BLOWER DIF P MM. H2O(IN. H2O)		762.0 (30.0)		762.0 (30.0)	
BLOWER INLET P MM. H2O(IN. H2O)		762.0 (30.0)		762.0 (30.0)	
BLOWER INLET TEMP. DEG. C(DEG. F)		43.9 (111.0)		43.3 (110.0)	
BLOWER REVOLUTIONS		40589.		69702.	
TOT FLOW STD. CU. METRES(SCF)		75.5 (2667.)		129.8 (4584.)	
HC SAMPLE METER/RANGE/PPM		37.0/ 3/ 370.		18.8/ 3/ 188.	
HC BCKGRD METER/RANGE/PPM		1.4/ 3/ 14.		1.5/ 3/ 15.	
CO SAMPLE METER/RANGE/PPM		77.0/ 2/ 4337.		73.6/ 3/ 1940.	
CO BCKGRD METER/RANGE/PPM		1.1/ 2/ 4.		1.1/ 3/ 2.	
CO2 SAMPLE METER/RANGE/PCT		88.4/ 3/ 1.45		82.8/ 3/ 1.53	
CO2 BCKGRD METER/RANGE/PCT		4.6/ 3/ .07		5.0/ 3/ .08	
NOX SAMPLE METER/RANGE/PPM		67.6/ 2/ 68.		23.1/ 2/ 25.	
NOX BCKGRD METER/RANGE/PPM		.6/ 2/ 1.		.5/ 2/ 1.	
DILUTION FACTOR		8.38		10.31	
HC CONCENTRATION PPM		358.		174.	
CO CONCENTRATION PPM		4129.		1858.	
CO2 CONCENTRATION PCT		1.59		1.46	
NOX CONCENTRATION PPM		67.1		24.6	
HC MASS GRAMS		15.60		13.06	
CO MASS GRAMS		34.00		280.86	
CO2 MASS GRAMS		2197.5		2413.3	
NOX MASS GRAMS		11.27		7.11	
HC GRAMS/KM		2.69		2.11	
CO GRAMS/KM		62.67		45.39	
CO2 GRAMS/KM		379.4		390.0	
NOX GRAMS/KM		1.95		1.15	
FUEL CONSUMPTION BY CB L/100KM		20.76		19.98	
RUN TIME		505.		868.	
MEASURED DISTANCE		5.79		6.19	
DPC, WET (DRY)		.881 (.863)		.895 (.877)	
SCF, WET (DRY)		1.000 (.968)		1.000 (.969)	
VOL (SCM)		205.3		205.1	
SAM BLK (SCM)		0.00		0.00	
KM (MEASURED)		11.98		11.92	
FUEL CONSUMPTION L/100KM		20.36		18.00	
COMPOSITE RESULTS		TEST NUMBER 731-21		3-BAG (4-BAG)	
BAROMETER MM HG 737.1		HUMIDITY G/KG 15.0		CARBON DIOXIDE G/KM 377.0 (373.6)	
TEMPERATURE DEG C 27.8				FUEL CONSUMPTION L/100KM 19.23 (19.01)	
				HYDROCARBONS (THC) G/KM 2.10 (2.08)	
				CARBON MONOXIDE G/KM 42.60 (41.48)	
				OXIDES OF NITROGEN G/KM 1.54 (1.56)	

VEHICLE EMISSIONS RESULTS - RICH BEST IDLE W/O VAC. ADV.
PROJECT 11-5830-004

TEST NO. 731-2 RUN 1 VEHICLE MODEL 70 CHEV MONTECARLO ENGINE 5.7 L(350. CID) V-8 TRANSMISSION A3		VEHICLE NO.73 DATE 12/ 8/80 BAG CART NO. 1 DYNO NO. 3 CVS NO. 2		TEST WEIGHT 1814. KG(4000. LBS) ACTUAL ROAD LOAD 8.9 KW(12.0 HP) GASOLINE EM-433-F ODOMETER ***** KM(86627. MILES)	
BAROMETER 737.11 MM HG(29.02 IN HG) RELATIVE HUMIDITY 43. PCT BAG RESULTS		DRY BULB TEMP. 30.6 DEG C(87.0 DEG F) ABS. HUMIDITY 12.1 GM/KG		NOX HUMIDITY CORRECTION FACTOR 1.05	
TEST CYCLE		SET		HFET	
BLOWER DIF P MM. H2O(IN. H2O)		774.7 (30.5)		774.7 (30.5)	
BLOWER INLET P MM. H2O(IN. H2O)		774.7 (30.5)		774.7 (30.5)	
BLOWER INLET TEMP. DEG. C(DEG. F)		43.3 (110.0)		43.3 (110.0)	
BLOWER REVOLUTIONS		112093.		61396.	
TOT FLOW STD. CU. METRES(SCF)		208.4 (7357.)		114.0 (4025.)	
HC SAMPLE METER/RANGE/PPM		19.0/ 3/ 190.		20.2/ 3/ 202.	
HC BCKGRD METER/RANGE/PPM		1.8/ 3/ 18.		1.8/ 3/ 18.	
CO SAMPLE METER/RANGE/PPM		55.8/ 3/ 1387.		44.1/ 3/ 1062.	
CO BCKGRD METER/RANGE/PPM		1.3/ 3/ 7.		1.1/ 3/ 1.	
CO2 SAMPLE METER/RANGE/PCT		91.6/ 3/ 1.71		50.9/ 2/ 2.29	
CO2 BCKGRD METER/RANGE/PCT		4.7/ 3/ .07		1.9/ 2/ .07	
NOX SAMPLE METER/RANGE/PPM		91.7/ 2/ 92.		48.4/ 3/ 145.	
NOX BCKGRD METER/RANGE/PPM		.7/ 2/ 1.		.2/ 3/ 1.	
DILUTION FACTOR		7.19		5.56	
HC CONCENTRATION PPM		175.		187.	
CO CONCENTRATION PPM		1317.		1000.	
CO2 CONCENTRATION PCT		1.65		2.23	
NOX CONCENTRATION PPM		91.1		144.7	
HC MASS GRAMS		20.97		12.31	
CO MASS GRAMS		319.39		132.75	
CO2 MASS GRAMS		6292.7		4650.7	
NOX MASS GRAMS		38.03		31.63	
RUN TIME		1399.		766.	
DPC, WET (DRY)		.881 (.849)		.820 (.810)	
SCF, WET (DRY)		1.000 (.970)		1.000 (.966)	
VOL (SCM)		208.4		114.0	
SAM BLK (SCM)		0.00		0.00	
KM (MEASURED)		21.74		16.48	
TEST NUMBER,		731-22		731-23	
BAROMETER, MM HG		737.1		736.3	
HUMIDITY, G/KG		12.1		10.8	
TEMPERATURE, DEG C		30.6		30.0	
CARBON DIOXIDE, G/KM		289.4		282.9	
FUEL CONSUMPTION, L/100KM		13.47		12.71	
HYDROCARBONS, G/KM		.94		.75	
CARBON MONOXIDE, G/KM		14.69		8.06	
OXIDES OF NITROGEN, G/KM		1.75		1.92	

TABLE D-25. TEST 741 EMISSIONS RESULTS

FTP VEHICLE EMISSIONS RESULTS - UNMODIFIED
PROJECT 11-5830-004TEST NO. 741-1 RUN 1
VEHICLE MODEL '70 FAIRLARK FORD
ENGINE 0.0 L (0. CID) V-8
TRANSMISSION A3VEHICLE NO. 74
DATE 9/23/80
BAG CART NO. 1
DYNO NO. 1
CVS NO. 2TEST WEIGHT 1814. KG (4000. LBS)
ACTUAL ROAD LOAD 8.9 KW (12.0 HP)
GASOLINE EM-433-F
ODOMETER ***** KM(45748. MILES)BAROMETER 740.92 MM HG(29.17 IN HG)
RELATIVE HUMIDITY 63. PCT
BAG RESULTSDRY BULB TEMP. 25.0 DEG C(77.0 DEG F)
ABS. HUMIDITY 12.9 GM/KG

NOX HUMIDITY CORRECTION FACTOR 1.08

BAG NUMBER
DESCRIPTION

BLOWER DIF P MM. H2O(IN. H2O)
BLOWER INLET P MM. H2O(IN. H2O)
BLOWER INLET TEMP. DEG. C(DEG. F)
BLOWER REVOLUTIONS
TOT FLOW STD. CU. METRES(SCF)
HC SAMPLE METER/RANGE/PPM
HC BCKGRD METER/RANGE/PPM
CO SAMPLE METER/RANGE/PPM
CO BCKGRD METER/RANGE/PPM
CO2 SAMPLE METER/RANGE/PCT
CO2 BCKGRD METER/RANGE/PCT
NOX SAMPLE METER/RANGE/PPM
NOX BCKGRD METER/RANGE/PPM
DILUTION FACTOR
HC CONCENTRATION PPM
CO CONCENTRATION PPM
CO2 CONCENTRATION PCT
NOX CONCENTRATION PPM
HC MASS GRAMS
CO MASS GRAMS
CO2 MASS GRAMS
NOX MASS GRAMS
HC GRAMS/KM
CO GRAMS/KM
CO2 GRAMS/KM
NOX GRAMS/KM
FUEL CONSUMPTION BY CB L/100KM
RUN TIME SECONDS
MEASURED DISTANCE KM
DFC, WET (DRY)
SCF, WET (DRY)
VOL (SCM)
SAM BLR (SCM)
KM (MEASURED)
FUEL CONSUMPTION L/100KM

1 COLD TRANSIENT	2 STABILIZED	3 HOT TRANSIENT	4 STABILIZED
812.8 (32.0)	812.8 (32.0)	812.8 (32.0)	817.9 (32.2)
741.7 (29.2)	749.3 (29.5)	734.5 (29.0)	734.5 (29.0)
42.2 (108.0)	42.2 (108.0)	41.7 (107.0)	43.3 (110.0)
40476	69468	40413	69374
76.0 (2683.1)	130.3 (4601.1)	76.0 (2683.1)	130.1 (4593.1)
49.4/ 3/ 484.	19.9/ 3/ 199.	34.3/ 3/ 343.	20.3/ 3/ 203.
1.9/ 3/ 19.	1.8/ 3/ 18.	2.0/ 3/ 20.	1.9/ 3/ 19.
57.8/ 2/ 2899.	96.2/ 12/ 242.	22.6/ 3/ 322.	89.5/ 12/ 220.
2/ 2/ 8.	2.9/ 12/ 5.	1/ 3/ 2.	2.7/ 12/ 5.
83.0/ 3/ 1.33	59.3/ 3/ 1.05	78.7/ 3/ 1.44	59.0/ 3/ 1.04
4.2/ 3/ .04	4.9/ 3/ .08	4.0/ 3/ .06	4.7/ 3/ .07
45.9/ 3/ 138.	77.8/ 2/ 80.	64.9/ 3/ 195.	90.5/ 2/ 91.
1.3/ 3/ 1.	1.2/ 2/ 1.	1.5/ 2/ 1.	1.5/ 2/ 2.
7.22	12.22	8.78	12.36
468.	182.	325.	186.
2747.	228.	495.	208.
1.48	1.39	1.39	.98
136.9	78.7	193.6	89.1
20.49	13.71	14.25	13.91
243.06	34.55	43.75	31.22
2054.1	2347.0	1931.5	2325.7
21.42	21.12	30.30	23.87
3.51	2.18	2.46	2.22
41.63	5.50	7.56	4.99
351.8	373.6	334.0	371.7
3.67	3.36	5.24	3.81
18.28	16.61	15.10	16.50
505.	867.	505.	863.
5.84	6.28	5.78	6.26
.897 (.879)		.907 (.888)	
1.000 (.969)		1.000 (.969)	
206.3		206.1	
0.00		0.00	
12.12		12.04	
17.42		15.83	

COMPOSITE RESULTS

TEST NUMBER 741-11
BAROMETER MM HG 740.9
HUMIDITY G/KG 12.9
TEMPERATURE DEG C 25.0CARBON DIOXIDE G/KM 358.2 (357.7)
FUEL CONSUMPTION L/100KM 16.54 (16.51)
HYDROCARBONS (THC) G/KM 2.53 (2.53)
CARBON MONOXIDE G/KM 13.55 (13.40)
OXIDES OF NITROGEN G/KM 3.94 (4.07)VEHICLE EMISSIONS RESULTS - UNMODIFIED
PROJECT 11-5830-004TEST NO. 741-1 RUN 1
VEHICLE MODEL '70 FAIRLARK FORD
ENGINE 0.0 L (0. CID) V-8
TRANSMISSION A3VEHICLE NO. 74
DATE 9/23/80
BAG CART NO. 1
DYNO NO. 1
CVS NO. 2TEST WEIGHT 1814. KG (4000. LBS)
ACTUAL ROAD LOAD 8.9 KW (12.0 HP)
GASOLINE EM-433-F
ODOMETER ***** KM(45760. MILES)BAROMETER 740.92 MM HG(29.17 IN HG)
RELATIVE HUMIDITY 49. PCT
BAG RESULTSDRY BULB TEMP. 25.0 DEG C(77.0 DEG F)
ABS. HUMIDITY 9.9 GM/KG

NOX HUMIDITY CORRECTION FACTOR .98

TEST CYCLE

BLOWER DIF P MM. H2O(IN. H2O)
BLOWER INLET P MM. H2O(IN. H2O)
BLOWER INLET TEMP. DEG. C(DEG. F)
BLOWER REVOLUTIONS
TOT FLOW STD. CU. METRES(SCF)
HC SAMPLE METER/RANGE/PPM
HC BCKGRD METER/RANGE/PPM
CO SAMPLE METER/RANGE/PPM
CO BCKGRD METER/RANGE/PPM
CO2 SAMPLE METER/RANGE/PCT
CO2 BCKGRD METER/RANGE/PCT
NOX SAMPLE METER/RANGE/PPM
NOX BCKGRD METER/RANGE/PPM
DILUTION FACTOR
HC CONCENTRATION PPM
CO CONCENTRATION PPM
CO2 CONCENTRATION PCT
NOX CONCENTRATION PPM
HC MASS GRAMS
CO MASS GRAMS
CO2 MASS GRAMS
NOX MASS GRAMS
RUN TIME SECONDS
DFC, WET (DRY)
SCF, WET (DRY)
VOL (SCM)
SAM BLR (SCM)
KM (MEASURED)

SET	HFET
812.8 (32.0)	812.8 (32.0)
741.7 (29.2)	741.7 (29.2)
42.8 (109.0)	43.3 (110.0)
111751	61224
209.6 (7400.1)	114.7 (4050.1)
33.7/ 3/ 337.	46.2/ 3/ 462.
1.9/ 3/ 19.	1.9/ 3/ 19.
25.7/ 3/ 596.	33.6/ 3/ 791.
1/ 3/ 7.	1/ 3/ 2.
88.6/ 3/ 1.65	46.0/ 2/ 2.06
3.7/ 3/ .04	1.5/ 2/ .05
85.1/ 3/ 253.	35.9/ 4/ 359.
1.6/ 3/ 2.	1.2/ 4/ 2.
7.70	6.15
320.	448.
562.	745.
1.60	2.01
253.7	357.3
39.73	29.51
137.12	99.45
6137.4	4230.0
99.17	78.85
1397.	766.
.870 (.856)	.837 (.824)
1.000 (.969)	1.000 (.965)
209.6	114.7
0.00	0.00
21.65	16.46

TEST NUMBER, 741-12
BAROMETER, MM HG 740.9
HUMIDITY, G/KG 9.9
TEMPERATURE, DEG C 25.0
CARBON DIOXIDE, G/KM 283.5
FUEL CONSUMPTION, L/100KM 12.77

HYDROCARBONS, G/KM 1.79
CARBON MONOXIDE, G/KM 6.33
OXIDES OF NITROGEN, G/KM 4.58

741-13
740.9
10.7
26.1
256.9
11.61

1.79
6.04
4.79

VEHICLE EMISSIONS RESULTS-- RICH BEST 10LS

TEST WEIGHT 1014. KG(4000. LBS)
ACTUAL ROAD LOAD 8.9 KW(12.0 HP)
GASOLINE EM-433-F
ODOMETER ***** KM(55825. MILES)

NOX HUMIDITY CORRECTION FACTOR 1.04

1	2	3	4
COLD TRANSIENT	STABILIZED	HOT TRANSIENT	STABILIZED
817.9 (32.2)	825.5 (32.5)	812.8 (32.0)	817.9 (32.2)
749.3 (29.5)	762.0 (30.0)	736.6 (29.0)	749.3 (29.5)
41.1 (106.0)	40.0 (104.0)	43.3 (110.0)	43.3 (110.0)
40442	69451	40672	69447
75.9 / (2680.)	130.4 / (4504.)	76.1 / (2689.)	129.8 / (4581.)
59.3 / 3064	34.3 / 349	42.3 / 422	32.3 / 323
2.1 / 3 / 21.	2.0 / 3 / 20.	2.0 / 3 / 20.	2.2 / 3 / 22.
78.8 / 2/4311.	58.6 / 2/2953.	81.8 / 3/2225.	90.9 / 3/2567.
.3 / 2 / 11.	.2 / 2 / 8.	.8 / 3 / 18.	.6 / 3 / 14.
78.6 / 3 / 1.44	51.9 / 3 / .90	74.7 / 3 / 1.34	53.5 / 3 / .93
4.8 / 3 / .07	4.5 / 3 / .07	4.3 / 3 / .07	4.6 / 3 / .07
44.3 / 3 / 133.	41.4 / 2 / 67.	61.4 / 3 / 1.4	80.2 / 2 / 80.
.6 / 3 / 2.	1.1 / 2 / 1.	.4 / 3 / 1.	1.6 / 2 / 2.
6.94	10.95	8.30	11.03
568.	330.	404.	303.
4294.	2841.	2110.	2462.
1.38	1.30	1.30	.87
131.4	66.1	183.1	78.7
24.86	24.80	17.75	22.68
379.38	431.21	187.02	372.03
8914.0	2007.5	1815.1	2069.1
19.84	17.15	27.74	20.34
4.26	3.95	3.07	3.64
64.95	58.64	32.29	59.67
327.7	319.5	313.4	331.9
3.40	2.73	4.79	3.26
18.92	18.78	15.96	18.66
504.	86.7	508.	86.6
5.84	6.28	5.79	6.23
.889 (.873)		.898 (.002)	
1.000 (.972)		1.000 (.972)	
206.3		205.9	
9.00		8.00	
12.12		12.03	
18.94		17.36	

	3-BAG	(4-BAG)
CARBON DIOXIDE	0/KM	319.5 (323.2)
FUEL CONSUMPTION	L/100KM	18.04 (18.00)
HYDROCARBONS (THC)	0/KM	3.77 (3.68)
CARBON MONOXIDE	0/KM	57.94 (55.25)
OXIDES OF NITROGEN	0/KM	3.43 (3.59)

PROJECT 11-5830-004

TEST WEIGHT 1814. KG(4000. LBS)
ACTUAL ROAD LOAD 8.9 KW(12.0 HP)
GASOLINE EM-433-F
ODOMETER ***** KM(45839. MILES)

NOX HUMIDITY CORRECTION FACTOR 1.01

SET	HFET
812.8 (32.0)	817.9 (32.2)
736.6 (29.0)	741.7 (29.2)
43.9 (111.0)	38.3 (101.0)
11710.75	6125.9
209.0 (7379.1)	1185.7 (408.6)
40.7/ 3/ 407.	45.6/ 3/ 456.
1.8/ 3/ 18.	1.3/ 3/ 13.
73.7/ 3/1943.	79.2/ 3/1201.
1.0/ 3/ 23.	1.2/ 3/ 3.
86.1/ 3/ 1.64	44.4/ 2/ 1.77
1.1/ 3/ 1.06	1.4/ 2/ 1.05
87.1/ 3/ 261.	32.5/ 4/ 325.
1.4/ 3/ 2.	1.1/ 4/ 1.
7.19	6.29
392.	445.
1830.	1130.
1.58	1.93
259.8	324.2
47.17	29.69
445.13	152.16
6058.9	4038.7
105.31	74.62
1395.	765.
.861 (.846)	.841 (.826)
1.000 (.768)	1.000 (.763)
209.0	115.7
0.00	0.00
21.62	16.43
741-22	741-23
740.2	740.2
11.1	11.9
25.6	25.6
280.1	246.8
13.53	11.49
2.18	1.81
20.59	9.26
4.87	4.54

TABLE D-27. TEST 741 EMISSIONS RESULTS

FTP VEHICLE EMISSIONS RESULTS - RICH BEST IDLE
PROJECT 11-5830-004TEST NO. 741-3 RUN 1
VEHICLE MODEL 70 FAIRLANE FORD
ENGINE 0.0 L (0. CID) V-8
TRANSMISSION A3VEHICLE NO. 74
DATE 9/27/80
BAG CART NO. 1
DYNO NO. 3
CVS NO. 2TEST WEIGHT 1814. KG(4000. LBS)
ACTUAL ROAD LOAD 8.9 KW(12.0 HP)
GASOLINE EM-433-F
ODOMETER ***** KM(65885. MILES)BAROMETER 739.39 MM HG(29.11 IN HG)
RELATIVE HUMIDITY 60. PCTDRY BULB TEMP. 25.0 DEG C(77.0 DEG F)
ABS. HUMIDITY 12.1 GM/KG

NOX HUMIDITY CORRECTION FACTOR 1.05

BAG RESULTS
BAG NUMBER
DESCRIPTION

	1 COLD TRANSIENT	2 STABILIZED	3 HOT TRANSIENT	4 STABILIZED
BLOWER DIF P MM. H2O(IN. H2O)	741.7 (29.2)	742.0 (30.0)	749.3 (29.5)	756.9 (29.8)
BLOWER INLET P MM. H2O(IN. H2O)	731.5 (28.8)	749.3 (29.5)	736.4 (29.0)	741.7 (29.2)
BLOWER INLET TEMP. DEG. C(DEG. F)	43.9 (111.0)	43.3 (110.0)	42.2 (108.0)	43.3 (110.0)
BLOWER REVOLUTIONS	40578.	49598.	40498.	49545.
TOT FLOW STD. CU. METRES(SCF)	76.1 (2686.)	130.2 (4599.)	76.1 (2686.)	130.3 (4600.)
HC SAMPLE METER/RANGE/PPM	58.3/ 3/ 585.	56.3/ 3/ 343.	41.2/ 3/ 412.	31.7/ 3/ 317.
HC BCKGRD METER/RANGE/PPM	3.3/ 3/ 33.	3.6/ 3/ 36.	3.6/ 3/ 36.	3.1/ 3/ 31.
CO SAMPLE METER/RANGE/PPM	78.3/ 2/ 4468.	60.8/ 2/ 3103.	83.7/ 3/ 2294.	96.4/ 3/ 2798.
CO BCKGRD METER/RANGE/PPM	3/ 2/ 11.	4/ 2/ 15.	6/ 3/ 14.	6/ 3/ 14.
CO2 SAMPLE METER/RANGE/PCT	77.0/ 3/ 1.41	51.1/ 3/ .89	73.0/ 3/ 1.33	52.7/ 3/ .92
CO2 BCKGRD METER/RANGE/PCT	4.4/ 3/ .07	4.6/ 3/ .07	4.1/ 3/ .06	4.1/ 3/ .06
NOX SAMPLE METER/RANGE/PPM	39.0/ 3/ 117.	63.7/ 2/ 84.	55.7/ 3/ 167.	72.8/ 2/ 73.
NOX BCKGRD METER/RANGE/PPM	1.5/ 3/ 0.	9/ 2/ 1.	2/ 3/ 1.	1.0/ 2/ 1.
DILUTION FACTOR	7.08	10.95	8.45	10.98
HC CONCENTRATION PPM	557.	330.	380.	289.
CO CONCENTRATION PPM	4251.	2979.	2179.	2633.
CO2 CONCENTRATION PCT	1.35	.82	1.27	.86
NOX CONCENTRATION PPM	116.7	82.9	166.6	71.7
HC MASS GRAMS	24.42	24.80	16.68	21.70
CO MASS GRAMS	376.49	451.69	193.00	405.82
CO2 MASS GRAMS	1879.6	1945.1	1768.7	2056.3
NOX MASS GRAMS	17.82	16.44	25.43	18.74
HC GRAMS/KM	4.23	3.97	2.89	3.43
CO GRAMS/KM	65.16	72.30	33.43	64.40
CO2 GRAMS/KM	32.4	314.6	306.3	325.5
NOX GRAMS/KM	3.09	2.63	4.40	2.97
FUEL CONSUMPTION BY CS L/100KM	18.83	18.81	15.71	18.68
RUN TIME SECONDS	505.	847.	505.	867.
MEASURED DISTANCE KM	5.78	4.23	5.77	6.32
DFC, WET (DRY)		.890 (.873)		.899 (.882)
SCF, WET (DRY)		1.000 (.971)		1.000 (.971)
VOL (SCM)		206.3		206.3
SAM BLR (SCM)		0.00		0.00
KM (MEASURED)		12.02		12.09
FUEL CONSUMPTION L/100KM		18.83		17.26

COMPOSITE RESULTS

TEST NUMBER 741-31
BAROMETER MM HG 739.4
HUMIDITY G/KG 12.1
TEMPERATURE DEG C 25.0CARBON DIOXIDE 8/KM 3-BAG (4-BAG)
FUEL CONSUMPTION L/100KM 314.5 (317.8)
HYDROCARBONS (THC) 8/KM 17.97 (17.93)
CARBON MONOXIDE 8/KM 3.73 (3.57)
OXIDES OF NITROGEN 8/KM 60.19 (57.90)
3.21 (3.31)VEHICLE EMISSIONS RESULTS - RICH BEST IDLE
PROJECT 11-5830-004TEST NO. 741-3 RUN 1
VEHICLE MODEL 70 FAIRLANE FORD
ENGINE 0.0 L (0. CID) V-8
TRANSMISSION A3VEHICLE NO. 74
DATE 9/27/80
BAG CART NO. 1
DYNO NO. 3
CVS NO. 2TEST WEIGHT 1814. KG(4000. LBS)
ACTUAL ROAD LOAD 8.9 KW(12.0 HP)
GASOLINE EM-433-F
ODOMETER ***** KM(65899. MILES)BAROMETER 739.90 MM HG(29.13 IN HG)
RELATIVE HUMIDITY 54. PCTDRY BULB TEMP. 26.1 DEG C(79.0 DEG F)
ABS. HUMIDITY 11.7 GM/KG

NOX HUMIDITY CORRECTION FACTOR 1.03

BAG RESULTS
TEST CYCLE

	SET	HFET
BLOWER DIF P MM. H2O(IN. H2O)	742.0 (30.0)	742.0 (30.0)
BLOWER INLET P MM. H2O(IN. H2O)	749.3 (29.5)	736.4 (29.0)
BLOWER INLET TEMP. DEG. C(DEG. F)	43.3 (110.0)	43.3 (110.0)
BLOWER REVOLUTIONS	112026.	61296.
TOT FLOW STD. CU. METRES(SCF)	209.8 (7407.)	114.9 (4059.)
HC SAMPLE METER/RANGE/PPM	38.0/ 3/ 380.	43.0/ 3/ 430.
HC BCKGRD METER/RANGE/PPM	2.4/ 3/ 26.	2.2/ 3/ 22.
CO SAMPLE METER/RANGE/PPM	79.3/ 3/ 2136.	49.4/ 3/ 1206.
CO BCKGRD METER/RANGE/PPM	.5/ 3/ 11.	4/ 3/ 9.
CO2 SAMPLE METER/RANGE/PCT	81.8/ 3/ 1.51	44.0/ 2/ 1.95
CO2 BCKGRD METER/RANGE/PCT	3.9/ 3/ .06	1.5/ 2/ .05
NOX SAMPLE METER/RANGE/PPM	71.4/ 3/ 214.	30.3/ 4/ 303.
NOX BCKGRD METER/RANGE/PPM	4/ 3/ 1.	1/ 4/ 1.
DILUTION FACTOR	7.66	6.36
HC CONCENTRATION PPM	357.	411.
CO CONCENTRATION PPM	2027.	1136.
CO2 CONCENTRATION PCT	1.46	1.91
NOX CONCENTRATION PPM	213.2	302.2
HC MASS GRAMS	43.23	27.27
CO MASS GRAMS	495.04	152.02
CO2 MASS GRAMS	5598.4	4009.7
NOX MASS GRAMS	88.24	65.80
RUN TIME SECONDS	1398.	765.
DFC, WET (DRY)	.869 (.854)	.843 (.830)
SCF, WET (DRY)	1.000 (.969)	1.000 (.967)
VOL (SCM)	209.8	114.9
SAM BLR (SCM)	0.00	0.00
KM (MEASURED)	21.47	16.25
TEST NUMBER:	741-32	741-33
BAROMETER, MM HG	739.9	739.9
HUMIDITY, G/KG	11.7	10.4
TEMPERATURE, DEG C	26.1	27.2
CARBON DIOXIDE, 8/KM	230.3	246.8
FUEL CONSUMPTION, L/100KM	12.93	11.39
HYDROCARBONS, 8/KM	2.01	1.68
CARBON MONOXIDE, 8/KM	23.06	9.36
OXIDES OF NITROGEN, 8/KM	4.11	4.05

TABLE D-28. TEST 744 EMISSIONS RESULTS

FIP VEHICLE EMISSIONS RESULTS - UNMODIFIED
PROJECT 11-5830-004TEST NO. 744-1 RUN 1
VEHICLE MODEL 70 FAIRLANE FORD
ENGINE 0.0 L (0. CID) V-8
TRANSMISSION A3VEHICLE NO. 74
DATE 10/ 7/80
BAG CART NO. 1
DYNO NO. 3
CVS NO. 2TEST WEIGHT 1814. KG (4000. LBS)
ACTUAL ROAD LOAD 3.9 KW (12.0 HP)
GASOLINE EM-433-F
ODOMETER ***** KM(65145. MILES)BAROMETER 748.03 MM HG(29.45 IN HG)
RELATIVE HUMIDITY 48. PCTDRY BULB TEMP. 23.9 DEG C(75.0 DEG F)
ABS. HUMIDITY 8.9 GR/KG

NOX HUMIDITY CORRECTION FACTOR .94

BAG RESULTS

BAG NUMBER
DESCRIPTIONBLOWER DIF P MM. H2O(IN. H2O)
BLOWER INLET P MM. H2O(IN. H2O)
BLOWER INLET TEMP. DEG. C(DEG. F)
BLOWER REVOLUTIONS
TOT FLOW STD. CU. METRES(SCF)
HC SAMPLE METER/RANGE/PPM
HC BCKGRD METER/RANGE/PPM
CO SAMPLE METER/RANGE/PPM
CO BCKGRD METER/RANGE/PPM
CO2 SAMPLE METER/RANGE/PCT
CO2 BCKGRD METER/RANGE/PCT
NOX SAMPLE METER/RANGE/PPM
NOX BCKGRD METER/RANGE/PPM
DILUTION FACTOR
HC CONCENTRATION PPM
CO CONCENTRATION PPM
CO2 CONCENTRATION PCT
NOX CONCENTRATION PPM
HC MASS GRAMS
CO MASS GRAMS
CO2 MASS GRAMS
NOX MASS GRAMSHC GRAMS/KM
CO GRAMS/KM
CO2 GRAMS/KM
NOX GRAMS/KM
FUEL CONSUMPTION BY CB L/100KMRUN TIME SECONDS
MEASURED DISTANCE KM
DFC, WET (DRY)
SCF, WET (DRY)
VOL (SCM)
SAM BLR (SCM)
KM (MEASURED)
FUEL CONSUMPTION L/100KM

1 COLD TRANSIENT	2 STABILIZED	3 HOT TRANSIENT	4 STABILIZED
742.0 (30.0)	742.0 (30.0)	742.0 (30.0)	774.7 (30.5)
749.3 (29.5)	749.3 (29.5)	749.3 (29.5)	755.9 (29.8)
43.1 (109.5)	43.3 (110.0)	43.3 (110.0)	43.3 (110.0)
40534.	46900.	40508.	49505.
76.9 (2714.)	131.9 (4658.)	76.8 (2711.)	131.6 (4646.)
40.5/ 3/ 405.	18.4/ 3/ 184.	29.1/ 3/ 291.	17.4/ 3/ 174.
1.4/ 3/ 14.	1.5/ 3/ 15.	1.5/ 3/ 15.	1.4/ 3/ 14.
87.9/ 3/ 2451.	80.4/ 11/ 365.	86.0/ 11/ 408.	95.8/ 12/ 241.
.4/ 3/ 9.	1.9/ 11/ 6.	1.2/ 11/ 3.	1.7/ 12/ 3.
79.9/ 3/ 1.47	56.2/ 3/ .99	75.7/ 3/ 1.38	56.2/ 3/ .99
4.0/ 3/ .06	4.0/ 3/ .06	4.0/ 3/ .06	3.9/ 3/ .06
49.7/ 3/ 149.	78.1/ 2/ 78.	54.6/ 3/ 194.	84.4/ 2/ 84.
.2/ 3/ 1.	1.0/ 2/ 1.	.3/ 3/ 1.	1.0/ 2/ 1.
7.69	12.87	9.25	13.03
393.	170.	278.	161.
2336.	348.	388.	230.
1.41	.93	1.33	.93
19.4	77.2	193.0	83.5
17.41	12.94	12.29	12.22
209.06	53.40	34.69	35.21
1990.2	2249.2	1864.1	2246.4
20.63	18.39	26.77	19.84
2.99	2.00	2.13	1.96
35.93	8.56	6.00	5.66
342.0	360.7	322.5	361.0
3.55	2.95	4.63	3.19
17.41	16.25	14.46	16.05
505.	867.	505.	867.
5.82	6.24	3.78	6.22
.903 (.889)		.912 (.898)	
1.000 (.974)		1.000 (.974)	
208.8		208.3	
0.00		0.00	
12.05		12.00	
14.88		15.29	

COMPOSITE RESULTS

TEST NUMBER 744-1
BAROMETER MM HG 748.0
HUMIDITY G/KG 8.9
TEMPERATURE DEG C 23.9CARBON DIOXIDE G/KM J-BAG (4-BAG)
FUEL CONSUMPTION L/100KM 16.00 (346.4)
HYDROCARBONS (THC) G/KM 1.25 (15.94)
CARBON MONOXIDE G/KM 13.54 (12.68)
OXIDES OF NITROGEN G/KM 3.53 (3.61)VEHICLE EMISSIONS RESULTS - UNMODIFIED
PROJECT 11-5830-004TEST NO. 744-1 RUN 1
VEHICLE MODEL 70 FAIRLANE FORD
ENGINE 0.0 L (0. CID) V-8
TRANSMISSION A3VEHICLE NO. 74
DATE 10/ 7/80
BAG CART NO. 1
DYNO NO. 3
CVS NO. 2TEST WEIGHT 1814. KG (4000. LBS)
ACTUAL ROAD LOAD 8.9 KW (12.0 HP)
GASOLINE EM-433-F
ODOMETER ***** KM(65159. MILES)BAROMETER 747.78 MM HG(29.44 IN HG)
RELATIVE HUMIDITY 49. PCTDRY BULB TEMP. 23.9 DEG C(75.0 DEG F)
ABS. HUMIDITY 8.9 GR/KG

NOX HUMIDITY CORRECTION FACTOR .94

BAG RESULTS

TEST CYCLE

BLOWER DIF P MM. H2O(IN. H2O)
BLOWER INLET P MM. H2O(IN. H2O)
BLOWER INLET TEMP. DEG. C(DEG. F)
BLOWER REVOLUTIONS
TOT FLOW STD. CU. METRES(SCF)
HC SAMPLE METER/RANGE/PPM
HC BCKGRD METER/RANGE/PPM
CO SAMPLE METER/RANGE/PPM
CO BCKGRD METER/RANGE/PPM
CO2 SAMPLE METER/RANGE/PCT
CO2 BCKGRD METER/RANGE/PCT
NOX SAMPLE METER/RANGE/PPM
NOX BCKGRD METER/RANGE/PPM
DILUTION FACTOR
HC CONCENTRATION PPM
CO CONCENTRATION PPM
CO2 CONCENTRATION PCT
NOX CONCENTRATION PPM
HC MASS GRAMS
CO MASS GRAMS
CO2 MASS GRAMS
NOX MASS GRAMSRUN TIME SECONDS
DFC, WET (DRY)
SCF, WET (DRY)
VOL (SCM)
SAM BLR (SCM)
KM (MEASURED)

SET	HFET
742.0 (30.0)	787.4 (31.0)
749.3 (29.5)	742.0 (30.0)
43.3 (110.0)	43.3 (110.0)
111942.	41358.
212.1 (7489.)	116.0 (4095.)
27.8/ 3/ 278.	37.1/ 3/ 371.
1.4/ 3/ 14.	1.6/ 3/ 16.
98.9/ 11/ 525.	30.0/ 3/ 701.
.7/ 11/ 2.	.1/ 3/ 2.
83.4/ 3/ 1.06	98.0/ 3/ 1.85
3.8/ 3/ .06	3.4/ 3/ .06
77.4/ 3/ 232.	29.6/ 4/ 296.
.3/ 3/ 1.	.1/ 4/ 1.
8.28	6.87
266.	357.
499.	665.
1.49	1.80
231.4	295.1
32.49	23.90
123.27	89.77
5791.8	3820.6
88.67	60.94
1397.	766.
.879 (.866)	.834 (.843)
1.000 (.970)	1.000 (.969)
212.1	116.0
0.00	0.00
21.72	16.40

TEST NUMBER, 744-1
BAROMETER, MM HG 747.8
HUMIDITY, G/KG 8.9
TEMPERATURE, DEG C 23.9
CARBON DIOXIDE, G/KM 266.2
FUEL CONSUMPTION, L/100KM 11.94HYDROCARBONS, G/KM 1.50
CARBON MONOXIDE, G/KM 5.47
OXIDES OF NITROGEN, G/KM 4.08744-1
747.8
8.5
25.0
233.0
10.51
1.46
5.47
3.72

TABLE D-29. TEST 742 EMISSIONS RESULTS

FTP		VEHICLE EMISSIONS RESULTS - 12 PERCENT MISFIRE AND 10° RETARD		PROJECT 11-5830-004	
TEST NO. 742-2 RUN 1		VEHICLE NO. 74		TEST WEIGHT 1814. KG (4000. LBS)	
VEHICLE MODEL 70 FAIRLANE FORD		DATE 9/19/80		ACTUAL ROAD LOAD 8.7 KW (12.0 HP)	
ENGINE 0.0 L (0. CID) V-8		BAG CART NO. 1		GASOLINE EM-433-F	
TRANSMISSION A3		DYNO NO. 3		ODOMETER ***** KM (62513. MILES)	
BAROMETER 742.70 MM HG (29.24 IN HG)		CVS NO. 2			
RELATIVE HUMIDITY 64. PCT		DRY BULB TEMP. 25.6 DEG C (78.0 DEG F)		NOX HUMIDITY CORRECTION FACTOR 1.10	
BAG RESULTS		ABS. HUMIDITY 13.4 GM/KG			
BAG NUMBER		1		2	
DESCRIPTION		COLD TRANSIENT		HOT TRANSIENT	
		STABILIZED		STABILIZED	
BLOWER DIF P MM. H2O (IN. H2O)		812.8 (32.0)		812.8 (32.0)	
BLOWER INLET P MM. H2O (IN. H2O)		734.4 (29.0)		741.7 (29.2)	
BLOWER INLET TEMP. DEG. C (DEG. F)		43.3 (110.0)		43.9 (111.0)	
BLOWER REVOLUTIONS		40431.		40431.	
TOT FLOW STD. CU. METRES (SCF)		76.0 (2684.)		75.8 (2676.)	
HC SAMPLE METER/RANGE/PPM		22.3/ 4/ 2250.		19.0/ 4/ 1900.	
HC BCKGRD METER/RANGE/PPM		11/ 4/ 10.		11/ 4/ 10.	
CO SAMPLE METER/RANGE/PPM		83.1/ 2/ 3289.		81.2/ 11/ 243.	
CO BCKGRD METER/RANGE/PPM		11/ 2/ 4.		11/ 3/ 2.	
CO2 SAMPLE METER/RANGE/PCT		82.4/ 3/ 1.32		79.9/ 3/ 1.47	
CO2 BCKGRD METER/RANGE/PCT		2.6/ 3/ .04		3.3/ 3/ .05	
NOX SAMPLE METER/RANGE/PPM		37.3/ 3/ 113.		50.0/ 3/ 152.	
NOX BCKGRD METER/RANGE/PPM		12/ 3/ 1.		11/ 3/ 0.	
DILUTION FACTOR		6.52		7.65	
HC CONCENTRATION PPM		2242.		1891.	
CO CONCENTRATION PPM		3103.		928.	
CO2 CONCENTRATION PCT		1.49		1.42	
NOX CONCENTRATION PPM		112.0		152.1	
HC MASS GRAMS		98.23		82.65	
CO MASS GRAMS		274.53		81.90	
CO2 MASS GRAMS		2067.6		1975.4	
NOX MASS GRAMS		17.84		24.17	
HC GRAMS/KH		17.04		14.27	
CO GRAMS/KH		47.61		14.14	
CO2 GRAMS/KH		358.6		341.0	
NOX GRAMS/KH		3.09		4.17	
FUEL CONSUMPTION BY CB L/100KH		20.80		17.43	
RUN TIME SECONDS		504.		505.	
MEASURED DISTANCE KM		5.77		5.79	
D/C, WET (DRY)		.885 (.847)		.893 (.875)	
SCF, WET (DRY)		1.000 (.958)		1.000 (.968)	
VOL (SCN)		206.5		206.0	
SAM BLR (SCN)		0.00		0.00	
KM (MEASURED)		12.05		12.06	
FUEL CONSUMPTION L/100KH		20.80		18.40	
COMPOSITE RESULTS					
TEST NUMBER 742-21				3-BAG (4-BAG)	
BAROMETER MM HG 742.7				CARBON DIOXIDE B/KH 372.9	
HUMIDITY B/KG 13.4				FUEL CONSUMPTION L/100KH 19.08	
TEMPERATURE DEG C 23.6				HYDROCARBONS (THC) G/KH 15.15	
				CARBON MONOXIDE B/KH 16.57	
				OXIDES OF NITROGEN B/KH 3.56	

VEHICLE EMISSIONS RESULTS - 12 PERCENT MISFIRE AND 10° RETARD
PROJECT 11-5830-004

TEST NO. 742-2 RUN 1		VEHICLE NO. 74		TEST WEIGHT 1814. KG (4000. LBS)	
VEHICLE MODEL 70 FAIRLANE FORD		DATE 9/19/80		ACTUAL ROAD LOAD 8.7 KW (12.0 HP)	
ENGINE 0.0 L (0. CID) V-8		BAG CART NO. 1		GASOLINE EM-433-F	
TRANSMISSION A3		DYNO NO. 3		ODOMETER ***** KM (65527. MILES)	
BAROMETER 743.46 MM HG (29.27 IN HG)		CVS NO. 2			
RELATIVE HUMIDITY 57. PCT		DRY BULB TEMP. 25.6 DEG C (78.0 DEG F)		NOX HUMIDITY CORRECTION FACTOR 1.04	
BAG RESULTS		ABS. HUMIDITY 11.8 GM/KG			
TEST CYCLE		SET		HFET	
BLOWER DIF P MM. H2O (IN. H2O)		838.2 (33.0)		812.8 (32.0)	
BLOWER INLET P MM. H2O (IN. H2O)		762.0 (30.0)		741.7 (29.2)	
BLOWER INLET TEMP. DEG. C (DEG. F)		43.3 (110.0)		43.9 (111.0)	
BLOWER REVOLUTIONS		111635.		81210.	
TOT FLOW STD. CU. METRES (SCF)		209.3 (7390.)		115.0 (4062.)	
HC SAMPLE METER/RANGE/PPM		21.0/ 4/ 2100.		25.2/ 4/ 2570.	
HC BCKGRD METER/RANGE/PPM		11/ 4/ 10.		12/ 4/ 20.	
CO SAMPLE METER/RANGE/PPM		36.3/ 3/ 859.		34.9/ 3/ 824.	
CO BCKGRD METER/RANGE/PPM		12/ 3/ 5.		11/ 3/ 2.	
CO2 SAMPLE METER/RANGE/PCT		91.4/ 3/ 1.71		45.5/ 2/ 2.03	
CO2 BCKGRD METER/RANGE/PCT		4.5/ 3/ .07		1.4/ 2/ .05	
NOX SAMPLE METER/RANGE/PPM		72.3/ 3/ 217.		98.1/ 3/ 294.	
NOX BCKGRD METER/RANGE/PPM		3/ 3/ 1.		3/ 3/ 1.	
DILUTION FACTOR		6.70		5.66	
HC CONCENTRATION PPM		2091.		2554.	
CO CONCENTRATION PPM		811.		775.	
CO2 CONCENTRATION PCT		1.65		1.99	
NOX CONCENTRATION PPM		216.1		293.6	
HC MASS GRAMS		252.41		169.40	
CO MASS GRAMS		197.72		103.66	
CO2 MASS GRAMS		6317.8		4192.9	
NOX MASS GRAMS		89.79		65.38	
RUN TIME SECONDS		1396.		765.	
D/C, WET (DRY)		.851 (.835)		.823 (.809)	
SCF, WET (DRY)		1.000 (.966)		1.000 (.964)	
VOL (SCN)		209.3		115.0	
SAM BLR (SCN)		0.00		0.00	
KM (MEASURED)		21.75		16.46	
TEST NUMBER		742-22		742-23	
BAROMETER MM HG 743.5				743.7	
HUMIDITY B/KG 11.8				11.1	
TEMPERATURE DEG C 25.6				25.6	
CARBON DIOXIDE B/KH 290.5				254.8	
FUEL CONSUMPTION L/100KH 14.58				12.69	
HYDROCARBONS G/KH 11.61				10.29	
CARBON MONOXIDE G/KH 9.09				6.31	
OXIDES OF NITROGEN G/KH 4.13				3.97	

TABLE D-30. TEST 742 EMISSIONS RESULTS

FTP VEHICLE EMISSIONS RESULTS - 12 PERCENT MISFIRE AND 10° RETARD
PROJECT 11-5830-004

TEST NO. 742-3 RUN 1
VEHICLE MODEL 70 FAIRLANE FORD
ENGINE 0.0 L (0. CID) V-8
TRANSMISSION A3

VEHICLE NO. 74
DATE 9/22/80
BAG CART NO. 1
DYNQ NO. 3
CVS NO. 2

TEST WEIGHT 1814. KG (4000. LBS)
ACTUAL ROAD LOAD 3.9 KW (12.0 HP)
GASOLINE EM-433-F
ODOMETER ***** KM(55682, MILES)

BAROMETER 740.41 MM HG(29.15 IN HG)
RELATIVE HUMIDITY 60. PCT

DRY BULB TEMP. 25.0 DEG C(77.0 DEG F)
ABS. HUMIDITY 12.1 GM/KG

NOX HUMIDITY CORRECTION FACTOR 1.05

BAG RESULTS

BAG NUMBER
DESCRIPTION
BLOWER DIF P MM. H2O(IN. H2O)
BLOWER IMLET P MM. H2O(IN. H2O)
BLOWER IMLET TEMP. DEG. C(DEG. F)
BLOWER REVOLUTIONS
TOT FLOW STD. CU. METRES(SCF)
HC SAMPLE METER/RANGE/PPM
HC BCKGRD METER/RANGE/PPM
CO SAMPLE METER/RANGE/PPM
CO BCKGRD METER/RANGE/PPM
CO2 SAMPLE METER/RANGE/PCT
CO2 BCKGRD METER/RANGE/PCT
NOX SAMPLE METER/RANGE/PPM
NOX BCKGRD METER/RANGE/PPM
DILUTION FACTOR
HC CONCENTRATION PPM
CO CONCENTRATION PPM
CO2 CONCENTRATION PCT
NOX CONCENTRATION PPM
HC MASS GRAMS
CO MASS GRAMS
CO2 MASS GRAMS
NOX MASS GRAMS
HC GRAMS/KH
CO GRAMS/KH
CO2 GRAMS/KH
NOX GRAMS/KH
FUEL CONSUMPTION BY CS L/100KH
RUN TIME SECONDS
MEASURED DISTANCE KM
DIF. WET (DRY)
SCF. WET (DRY)
VOL (SCH)
SAM BLR (SCH)
KM (MEASURED)
FUEL CONSUMPTION L/100KH

1 COLD TRANSIENT	2 STABILIZED	3 HOT TRANSIENT	4 STABILIZED
833.1 (32.8)	812.8 (32.0)	812.8 (32.0)	812.8 (32.0)
762.0 (30.0)	749.3 (27.5)	735.6 (29.0)	749.3 (29.0)
41.1 (106.0)	42.2 (108.0)	43.3 (110.0)	42.8 (109.0)
40343.	69477.	40368.	69451.
75.6 (2670.)	130.2 (4598.)	75.6 (2670.)	130.0 (4590.)
22.4/ 4/2240.	12.0/ 4/1200.	18.6/ 4/1860.	12.7/ 4/1270.
1.1/ 4/ 10.	2.2/ 4/ 20.	2.2/ 4/ 20.	2.2/ 4/ 20.
64.3/ 2/3504.	69.4/11/ 291.	34.1/ 3/ 803.	39.9/12/ 221.
2.2/ 2/ 8.	1.7/11/ 5.	1.1/ 3/ 2.	1.9/12/ 4.
84.2/ 3/ 1556	61.3/ 3/ 1.09	81.0/ 3/ 1.49	81.4/ 3/ 1.09
3.5/ 3/ .05	4.2/ 3/ .06	3.9/ 3/ .06	3.7/ 3/ .06
37.2/ 3/ 112.	70.5/ 2/ 71.	53.8/ 3/ 151.	81.7/ 2/ 82.
2.2/ 3/ 1.	1.0/ 2/ 1.	3.3/ 3/ 1.	1.0/ 2/ 1.
6.34	10.93	7.64	10.01
2232.	1182.	1843.	1252.
3325.	275.	763.	209.
1.51	1.03	1.44	1.04
111.1	39.6	150.6	80.8
29.31	88.75	80.35	93.82
297.75	41.08	67.17	31.61
2093.1	2456.5	1991.5	2473.3
16.85	18.18	24.36	21.06
16.81	14.20	13.93	15.16
50.56	6.71	11.64	5.11
361.5	395.3	345.2	399.7
2.91	2.93	4.22	3.40
21.10	19.26	17.40	19.45
503.	867.	504.	867.
5.79	6.21	5.77	6.19
.884 (.847)		.893 (.876)	
1.000 (.969)		1.000 (.969)	
205.9		205.6	
0.00		0.00	
12.00		11.94	
20.14		18.46	

COMPOSITE RESULTS

TEST NUMBER 742-31
BAROMETER MM HG 740.4
HUMIDITY G/KG 12.1
TEMPERATURE DEG C 25.0

CARBON DIOXIDE G/KH 3.868 (4.848)
FUEL CONSUMPTION L/100KH 19.13 (19.19)
HYDROCARBONS (THC) G/KH 14.71 (14.97)
CARBON MONOXIDE G/KH 17.16 (16.69)
OXIDES OF NITROGEN G/KH 3.28 (3.42)

VEHICLE EMISSIONS RESULTS - 12 PERCENT MISFIRE AND 10° RETARD
PROJECT 11-5830-004

TEST NO. 742-3 RUN 1
VEHICLE MODEL 70 FAIRLANE FORD
ENGINE 0.0 L (0. CID) V-8
TRANSMISSION A3

VEHICLE NO. 74
DATE 9/22/80
BAG CART NO. 1
DYNQ NO. 3
CVS NO. 2

TEST WEIGHT 1814. KG (4000. LBS)
ACTUAL ROAD LOAD 8.9 KW (12.0 HP)
GASOLINE EM-433-F
ODOMETER ***** KM(69693, MILES)

BAROMETER 740.65 MM HG(29.16 IN HG)
RELATIVE HUMIDITY 55. PCT

DRY BULB TEMP. 24.4 DEG C(75.9 DEG F)
ABS. HUMIDITY 10.9 GM/KG

NOX HUMIDITY CORRECTION FACTOR 1.01

BAG RESULTS

TEST CYCLE
BLOWER DIF P MM. H2O(IN. H2O)
BLOWER IMLET P MM. H2O(IN. H2O)
BLOWER IMLET TEMP. DEG. C(DEG. F)
BLOWER REVOLUTIONS
TOT FLOW STD. CU. METRES(SCF)
HC SAMPLE METER/RANGE/PPM
HC BCKGRD METER/RANGE/PPM
CO SAMPLE METER/RANGE/PPM
CO BCKGRD METER/RANGE/PPM
CO2 SAMPLE METER/RANGE/PCT
CO2 BCKGRD METER/RANGE/PCT
NOX SAMPLE METER/RANGE/PPM
NOX BCKGRD METER/RANGE/PPM
DILUTION FACTOR
HC CONCENTRATION PPM
CO CONCENTRATION PPM
CO2 CONCENTRATION PCT
NOX CONCENTRATION PPM
HC MASS GRAMS
CO MASS GRAMS
CO2 MASS GRAMS
NOX MASS GRAMS
RUN TIME SECONDS
DIF. WET (DRY)
SCF. WET (DRY)
VOL (SCH)
SAM BLR (SCH)
KM (MEASURED)
TEST NUMBER, MM HG
BAROMETER, G/KG
HUMIDITY, DEG C
TEMPERATURE, G/KH
CARBON DIOXIDE, L/100KH
FUEL CONSUMPTION, G/KH
HYDROCARBONS, G/KH
CARBON MONOXIDE, G/KH
OXIDES OF NITROGEN, G/KH

SET	FET
817.9 (32.2)	817.9 (32.2)
749.3 (29.5)	749.3 (29.5)
43.3 (110.0)	43.9 (111.0)
111699.	61228.
209.0 (7379.)	114.4 (4041.)
21.0/ 4/2100.	24.6/ 4/2460.
2.2/ 4/ 20.	3.7/ 4/ 30.
33.3/ 3/ 753.	29.6/ 3/ 691.
1.1/ 3/ 2.	1.1/ 3/ 2.
91.8/ 3/ 1.72	44.3/ 2/ 1.97
3.8/ 3/ .04	1.5/ 2/ .05
74.2/ 3/ 223.	94.7/ 3/ 284.
1.3/ 3/ 1.	1.4/ 3/ 1.
6.70	5.88
2083.	2435.
741.	651.
1.67	1.92
221.8	283.1
251.01	160.49
180.40	86.80
4375.9	4027.7
89.19	62.84
1397.	765.
.851 (.835)	.830 (.816)
1.000 (.966)	1.000 (.965)
209.0	114.4
0.00	0.00
21.54	16.37
742-32	742-33
740.7	740.7
10.9	11.1
24.4	25.4
296.0	246.1
14.77	12.19
11.63	9.82
8.37	5.30
4.14	3.84

TABLE D-31. TEST 743 EMISSIONS RESULTS

FTP VEHICLE EMISSIONS RESULTS - UNMODIFIED
PROJECT 11-5830-004TEST NO. 743-1 RUN 1
VEHICLE MODEL 70 FAIRLANE FORD
ENGINE 0.0 L (0. CID) V-8
TRANSMISSION A3VEHICLE NO. 74
DATE 10/2/80
BAG CART NO. 1
DYN0 NO. 3
CVS NO. 2TEST WEIGHT 1814, KG (4000, LBS)
ACTUAL ROAD LOAD 8.9 KW (12.0 HP)
GASOLINE EM-433-F
ODOMETER ***** KH(65962, MILES)BAROMETER 742.70 MM HG(29.24 IN HG)
RELATIVE HUMIDITY 55, PCT
BAG RESULTSDRY BULB TEMP. 24.4 DEG C(76.0 DEG F)
ABS. HUMIDITY 10.9 GM/KG

NOX HUMIDITY CORRECTION FACTOR 1.00

BAG NUMBER
DESCRIPTION

	1 COLD TRANSIENT	2 STABILIZED	3 HOT TRANSIENT	4 STABILIZED
BLOWER DIF P MM, H2O(IN, H2O)	762.0 (30.0)	762.0 (30.0)	749.3 (29.5)	762.0 (30.0)
BLOWER INLET P MM, H2O(IN, H2O)	749.3 (29.5)	734.4 (29.0)	734.4 (29.0)	734.4 (29.0)
BLOWER INLET TEMP. DEG. C(DEG. F)	43.3 (110.0)	43.3 (110.0)	43.3 (110.0)	43.3 (110.0)
BLOWER REVOLUTIONS	40570	69612	40511	67501
TOT FLOW STD. CU. METRES(SCF)	76.3 (2694.)	131.1 (4629.)	76.3 (2694.)	130.9 (4621.)
HC SAMPLE METER/RANGE/PPM	40.6/ 3/ 406.	18.7/ 3/ 187.	28.8/ 3/ 288.	18.0/ 3/ 180.
HC BCKGRD METER/RANGE/PPM	2.1/ 3/ 21.	1.8/ 3/ 18.	1.8/ 3/ 18.	1.7/ 3/ 17.
CO SAMPLE METER/RANGE/PPM	85.4/ 3/ 2344.	65.7/ 11/ 239.	88.8/ 11/ 431.	92.1/ 12/ 228.
CO BCKGRD METER/RANGE/PPM	3/ 3/ 7.	1.7/ 11/ 5.	1.2/ 11/ 3.	1.9/ 12/ 4.
CO2 SAMPLE METER/RANGE/PCT	80.8/ 3/ 1.49	57.6/ 3/ 1.02	79.9/ 3/ 1.47	57.6/ 3/ 1.02
CO2 BCKGRD METER/RANGE/PCT	3.8/ 3/ .06	3.7/ 3/ .06	3.8/ 3/ .06	3.6/ 3/ .06
NOX SAMPLE METER/RANGE/PPM	47.0/ 3/ 141.	75.1/ 2/ 75.	60.9/ 3/ 183.	80.5/ 2/ 81.
NOX BCKGRD METER/RANGE/PPM	.77/ 3/ 2.	1.4/ 2/ 1.	.4/ 3/ 1.	1.3/ 2/ 1.
DILUTION FACTOR	7.65	12.64	8.72	12.70
HC CONCENTRATION PPM	388.	170.	272.	164.
CO CONCENTRATION PPM	2248.	254.	408.	217.
CO2 CONCENTRATION PCT	1.44	.96	1.42	.96
NOX CONCENTRATION PPM	139.2	73.8	181.8	79.3
HC MASS GRAMS	17.06	12.88	11.97	12.40
CO MASS GRAMS	199.70	38.78	36.29	33.00
CO2 MASS GRAMS	2005.4	2311.7	1978.6	2311.3
NOX MASS GRAMS	20.40	18.59	26.64	19.94
HC GRAMS/KM	2.93	2.05	2.07	1.98
CO GRAMS/KM	3.34	6.17	4.26	5.28
CO2 GRAMS/KM	344.8	367.8	341.3	369.5
NOX GRAMS/KM	3.51	2.96	4.59	3.19
FUEL CONSUMPTION BY CB L/100KM	17.42	16.39	15.27	16.39
RUN TIME SECONDS	505.	867.	505.	867.
MEASURED DISTANCE KM	5.82	6.29	5.80	6.26
DFC, WET (DRY)		.902 (.896)		.908 (.892)
SCF, WET (DRY)		1.000 (.971)		1.000 (.971)
UCL (SCM)		207.4		207.2
SAM BLR (SCM)		0.00		0.00
KM (MEASURED)		12.10		12.05
FUEL CONSUMPTION L/100KM		16.08		15.83

COMPOSITE RESULTS

TEST NUMBER 743-11
BAROMETER MM HG 742.7
HUMIDITY G/KG 10.9
TEMPERATURE DEG C 24.4CARBON DIOXIDE G/KM 3-BA8 (4-BA8)
FUEL CONSUMPTION L/100KM 333.8 (354.3)
HYDROCARBONS (THC) G/KM 16.30 (14.29)
CARBON MONOXIDE G/KM 2.24 (2.22)
OXIDES OF NITROGEN G/KM 12.02 (11.75)VEHICLE EMISSIONS RESULTS - UNMODIFIED
PROJECT 11-5830-004TEST NO. 743-1 RUN 1
VEHICLE MODEL 70 FAIRLANE FORD
ENGINE 0.0 L (0. CID) V-8
TRANSMISSION A3VEHICLE NO. 74
DATE 10/2/80
BAG CART NO. 1
DYN0 NO. 3
CVS NO. 2TEST WEIGHT 1814, KG (4000, LBS)
ACTUAL ROAD LOAD 8.9 KW (12.0 HP)
GASOLINE EM-433-F
ODOMETER ***** KH(65973, MILES)BAROMETER 742.95 MM HG(29.25 IN HG)
RELATIVE HUMIDITY 55, PCT
BAG RESULTSDRY BULB TEMP. 24.4 DEG C(76.0 DEG F)
ABS. HUMIDITY 10.9 GM/KG

NOX HUMIDITY CORRECTION FACTOR 1.00

TEST CYCLE

	SET	HFET
BLOWER DIF P MM, H2O(IN, H2O)	762.0 (30.0)	762.0 (30.0)
BLOWER INLET P MM, H2O(IN, H2O)	736.6 (29.0)	736.6 (29.0)
BLOWER INLET TEMP. DEG. C(DEG. F)	42.8 (109.0)	43.3 (110.0)
BLOWER REVOLUTIONS	112040	61366
TOT FLOW STD. CU. METRES(SCF)	211.3 (7460.)	115.6 (4080.)
HC SAMPLE METER/RANGE/PPM	29.7/ 3/ 297.	38.4/ 3/ 384.
HC BCKGRD METER/RANGE/PPM	1.5/ 3/ 15.	1.7/ 3/ 17.
CO SAMPLE METER/RANGE/PPM	24.8/ 3/ 574.	30.4/ 3/ 711.
CO BCKGRD METER/RANGE/PPM	.2/ 3/ 5.	.1/ 3/ 2.
CO2 SAMPLE METER/RANGE/PCT	86.7/ 3/ 1.61	43.0/ 2/ 1.90
CO2 BCKGRD METER/RANGE/PCT	3.7/ 3/ .06	1.5/ 2/ .05
NOX SAMPLE METER/RANGE/PPM	78.5/ 3/ 236.	30.7/ 4/ 307.
NOX BCKGRD METER/RANGE/PPM	.3/ 3/ 1.	.1/ 4/ 1.
DILUTION FACTOR	7.91	6.69
HC CONCENTRATION PPM	284.	370.
CO CONCENTRATION PPM	542.	871.
CO2 CONCENTRATION PCT	1.56	1.85
NOX CONCENTRATION PPM	234.7	306.1
HC MASS GRAMS	34.58	24.62
CO MASS GRAMS	133.43	90.27
CO2 MASS GRAMS	6032.4	3917.0
NOX MASS GRAMS	95.27	68.53
RUN TIME SECONDS	1397.	765.
DFC, WET (DRY)	.874 (.858)	.851 (.836)
SCF, WET (DRY)	1.000 (.967)	1.000 (.965)
UCL (SCM)	211.3	115.6
SAM BLR (SCM)	0.00	0.00
KM (MEASURED)	21.61	16.22
TEST NUMBER,	743-12	743-13
BAROMETER, MM HG	743.0	742.7
HUMIDITY, G/KG	10.9	11.1
TEMPERATURE, DEG C	24.4	25.6
CARBON DIOXIDE, G/KM	279.1	241.4
FUEL CONSUMPTION, L/100KM	12.54	10.88
HYDROCARBONS, G/KM	1.60	1.52
CARBON MONOXIDE, G/KM	6.17	5.56
OXIDES OF NITROGEN, G/KM	4.41	4.22

TABLE D-32. TEST 743 EMISSIONS RESULTS
FTP VEHICLE EMISSIONS RESULTS - LEAN IDLE
PROJECT 11-5830-004

TEST NO. 743-2 RUN 1
VEHICLE MODEL 70 FAIRLANE FORD
ENGINE 0.0 L (0, CID) V-B
TRANSMISSION A3

VEHICLE NO. 74
DATE 10/ 3/80
BAG CART NO. 1
DYNO NO. 3
CVS NO. 2

TEST WEIGHT 1814. KG (4000, LBS)
ACTUAL ROAD LOAD 3.7 KM (12.0 HP)
GASOLINE EM-433-F
ODOMETER ***** KM(66015, MILES)

BAROMETER 747.01 MM HG(29.41 IN HG)
RELATIVE HUMIDITY 36, PCT

DRY BULB TEMP, 25.0 DEG C(77.0 DEG F)
ABS. HUMIDITY 7.2 GM/KG

NOX HUMIDITY CORRECTION FACTOR .90

BAG NUMBER
DESCRIPTION
BLOWER DIF P MM, H2O(IN, H2O)
BLOWER IMLET P MM, H2O(IN, H2O)
BLOWER IMLET TEMP, DEG. C(DEG. F)
BLOWER REVOLUTIONS
TOT FLOW STD. CU. METRES(SCF)
HC SAMPLE METER/RANGE/PPM
HC BCKGRD METER/RANGE/PPM
CO SAMPLE METER/RANGE/PPM
CO BCKGRD METER/RANGE/PPM
CO2 SAMPLE METER/RANGE/PCT
CO2 BCKGRD METER/RANGE/PCT
NOX SAMPLE METER/RANGE/PPM
NOX BCKGRD METER/RANGE/PPM
DILUTION FACTOR
HC CONCENTRATION PPM
CO CONCENTRATION PPM
CO2 CONCENTRATION PCT
NOX CONCENTRATION PPM
HC MASS GRAMS
CO MASS GRAMS
CO2 MASS GRAMS
NOX MASS GRAMS
HC GRAMS/KM
CO GRAMS/KM
CO2 GRAMS/KM
NOX GRAMS/KM
FUEL CONSUMPTION BY CB L/100KM
RUN TIME SECONDS
MEASURED DISTANCE KM
DFC, WET (DRY)
SCF, WET (DRY)
VOL (SCM)
SAM BLR (SCM)
KM (MEASURED)
FUEL CONSUMPTION L/100KM

1 COLD TRANSIENT	2 STABILIZED	3 HOT TRANSIENT	4 STABILIZED
762.0 (30.0)	762.0 (30.0)	762.0 (30.0)	762.0 (30.0)
749.3 (29.5)	749.3 (29.5)	736.4 (29.0)	749.3 (29.5)
43.3 (110.0)	43.3 (110.0)	42.8 (109.0)	42.8 (109.0)
40587	49603	40506	49552
76.8 (2712.1)	131.7 (4651.1)	76.8 (2713.1)	131.8 (4653.1)
49.4/ 3/ 464.	26.3/ 3/ 243.	43.6/ 3/ 436.	32.7/ 3/ 329.
1.7/ 3/ 17.	1.7/ 3/ 17.	1.6/ 3/ 16.	1.5/ 3/ 15.
77.0/ 3/ 2056	72.9/12/ 168.	81.3/11/ 372.	67.9/12/ 153.
2/ 3/ 5.	2.7/12/ 5.	1.2/11/ 3.	1.3/12/ 2.
82.6/ 3/ 1.52	57.6/ 3/ 1.02	78.6/ 3/ 1.44	56.5/ 3/ .99
3.7/ 3/ .06	4.3/ 3/ .07	3.8/ 3/ .06	4.1/ 3/ .06
63.0/ 3/ 189.	84.8/ 2/ 85.	76.5/ 3/ 230.	86.3/ 2/ 87.
1.4/ 3/ 1.	1.3/ 2/ 1.	1.2/ 3/ 1.	1.0/ 2/ 1.
7.58	12.67	8.82	12.97
451	247.	422.	315.
1968.	158.	354.	143.
1.47	.95	1.39	.94
108.0	83.6	229.0	85.7
18.79	18.79	18.69	23.95
175.96	24.20	31.69	22.45
2073.7	2302.2	1954.1	2257.4
24.73	18.86	30.13	19.34
3.36	2.93	3.15	3.77
29.59	3.77	5.35	3.54
348.8	358.9	329.8	355.5
4.16	2.94	5.09	3.04
17.33	15.97	14.86	15.92
505.	867.	505.	867.
5.95	6.41	5.93	6.35
.902 (.891)		.909 (.899)	
1.000 (.977)		1.000 (.978)	
208.6		208.6	
0.00		0.00	
12.36		12.27	
16.62		15.41	

COMPOSITE RESULTS

TEST NUMBER 743-21
BAROMETER MM HG 747.0
HUMIDITY G/KG 7.2
TEMPERATURE DEG C 25.0

CARBON DIOXIDE G/KM 348.9 (347.8)
FUEL CONSUMPTION L/100KM 15.95 (15.93)
HYDROCARBONS (THC) G/KM 3.08 (3.33)
CARBON MONOXIDE G/KM 9.55 (9.48)
OXIDES OF NITROGEN G/KM 3.78 (3.81)

VEHICLE EMISSIONS RESULTS - LEAN IDLE
PROJECT 11-5830-004

TEST NO. 743-2 RUN 1
VEHICLE MODEL 70 FAIRLANE FORD
ENGINE 0.0 L (0, CID) V-B
TRANSMISSION A3

VEHICLE NO. 74
DATE 10/ 3/80
BAG CART NO. 1
DYNO NO. 3
CVS NO. 2

TEST WEIGHT 1814. KG (4000, LBS)
ACTUAL ROAD LOAD 8.9 KM (12.0 HP)
GASOLINE EM-433-F
ODOMETER ***** KM(66032, MILES)

BAROMETER 747.27 MM HG(29.42 IN HG)
RELATIVE HUMIDITY 38, PCT

DRY BULB TEMP, 24.4 DEG C(76.0 DEG F)
ABS. HUMIDITY 7.4 GM/KG

NOX HUMIDITY CORRECTION FACTOR .90

TEST CYCLE
BLOWER DIF P MM, H2O(IN, H2O)
BLOWER IMLET P MM, H2O(IN, H2O)
BLOWER IMLET TEMP, DEG. C(DEG. F)
BLOWER REVOLUTIONS
TOT FLOW STD. CU. METRES(SCF)
HC SAMPLE METER/RANGE/PPM
HC BCKGRD METER/RANGE/PPM
CO SAMPLE METER/RANGE/PPM
CO BCKGRD METER/RANGE/PPM
CO2 SAMPLE METER/RANGE/PCT
CO2 BCKGRD METER/RANGE/PCT
NOX SAMPLE METER/RANGE/PPM
NOX BCKGRD METER/RANGE/PPM
DILUTION FACTOR
HC CONCENTRATION PPM
CO CONCENTRATION PPM
CO2 CONCENTRATION PCT
NOX CONCENTRATION PPM
HC MASS GRAMS
CO MASS GRAMS
CO2 MASS GRAMS
NOX MASS GRAMS
RUN TIME SECONDS
DFC, WET (DRY)
SCF, WET (DRY)
VOL (SCM)
SAM BLR (SCM)
KM (MEASURED)

SET	HFET
762.0 (30.0)	762.0 (30.0)
749.3 (29.5)	749.3 (29.5)
43.3 (110.0)	43.3 (110.0)
112054	62005
212.1 (7491.1)	117.3 (4143.1)
39.9/ 3/ 399.	42.1/ 3/ 421.
1.4/ 3/ 14.	1.7/ 3/ 17.
85.9/11/ 407.	97.0/11/ 506.
7/11/ 2.	7/11/ 2.
85.8/ 3/ 1.59	42.3/ 2/ 1.86
3.9/ 3/ .04	1.5/ 2/ .05
85.6/ 3/ 257.	32.9/ 4/ 329.
.5/ 3/ 2.	.2/ 4/ 2.
8.03	6.87
387.	405.
387.	480.
1.54	1.81
255.5	327.3
47.31	27.50
95.70	65.58
5973.5	3897.1
93.46	65.77
1397.	773.
.875 (.865)	.854 (.845)
1.000 (.973)	1.000 (.971)
212.1	117.3
0.00	0.00
22.02	16.59

TEST NUMBER, 743-22
BAROMETER, MM HG 747.3
HUMIDITY, G/KG 7.2
TEMPERATURE, DEG C 24.4
CARBON DIOXIDE, G/KM 271.2
FUEL CONSUMPTION, L/100KM 12.16
HYDROCARBONS, G/KM 2.15
CARBON MONOXIDE, G/KM 4.35
OXIDES OF NITROGEN, G/KM 4.24

743-23
747.0
7.2
25.0
234.9
10.52
1.66
3.95
3.96

TABLE D-33. TEST 743 EMISSIONS RESULTS
FTP VEHICLE EMISSIONS RESULTS - LEAN IDLE
PROJECT 11-5830-004

TEST NO. 743-3 RUN 1
VEHICLE MODEL 70 FAIRLANE FORD
ENGINE 0.0 L (0. CID) V-8
TRANSMISSION A3

VEHICLE NO. 74
DATE 10/ 6/80
BAG CART NO. 1
DYNQ NO. 3
CVS NO. 2

TEST WEIGHT 1814. KG (4000. LBS)
ACTUAL ROAD LOAD 8.9 KM (12.0 HP)
GASOLINE EM-433-F
ODOMETER ***** KM(66073. MILES)

BAROMETER 748.79 MM HG(29.48 IN HG)
RELATIVE HUMIDITY 59. PCT

DRY BULB TEMP. 24.4 DEG C(76.0 DEG F)
ASS. HUMIDITY 11.5 GM/KG

NOX HUMIDITY CORRECTION FACTOR 1.03

BAG RESULTS
BAG NUMBER
DESCRIPTION

BLOWER DIF P MM. H2O(IN. H2O)
BLOWER INLET P MM. H2O(IN. H2O)
BLOWER INLET TEMP. DEG. C(DEG. F)
BLOWER REVOLUTIONS
TOT FLOW STD. CU. METRES(SCF)
HC SAMPLE METER/RANGE/PPM
HC BCKGRD METER/RANGE/PPM
CO SAMPLE METER/RANGE/PPM
CO BCKGRD METER/RANGE/PPM
CO2 SAMPLE METER/RANGE/PCT
CO2 BCKGRD METER/RANGE/PCT
NOX SAMPLE METER/RANGE/PPM
NOX BCKGRD METER/RANGE/PPM
DILUTION FACTOR
HC CONCENTRATION PPM
CO CONCENTRATION PPM
CO2 CONCENTRATION PCT
NOX CONCENTRATION PPM
HC MASS GRAMS
CO MASS GRAMS
CO2 MASS GRAMS
NOX MASS GRAMS

HC GRAMS/KM
CO GRAMS/KM
CO2 GRAMS/KM
NOX GRAMS/KM
FUEL CONSUMPTION BY CB L/100KM

RUN TIME SECONDS
MEASURED DISTANCE KM
DFC, WET (DRY)
SCF, WET (DRY)
VOL (SCM)
SAM BLR (SCM)
KM (MEASURED)
FUEL CONSUMPTION L/100KM

1 COLD TRANSIENT	2 STABILIZED	3 HOT TRANSIENT	4 STABILIZED
774.7 (30.5)	762.0 (30.0)	749.3 (29.5)	762.0 (30.0)
762.0 (30.0)	749.3 (29.5)	736.6 (29.0)	749.3 (29.5)
43.3 (110.0)	43.3 (110.0)	43.3 (110.0)	43.3 (110.0)
40586.	69582.	40537.	69549.
76.9 (2715.)	132.0 (4662.)	77.1 (2721.)	132.0 (4660.)
45.3/ 3/ 455.	29.6/ 3/ 296.	50.6/ 3/ 506.	31.3/ 3/ 313.
1.3/ 3/ 15.	1.6/ 3/ 16.	2.0/ 3/ 20.	1.7/ 3/ 17.
76.2/ 3/ 2028.	70.5/ 12/ 161.	87.7/ 11/ 422.	80.6/ 12/ 191.
81.1/ 3/ 2.	1.7/ 12/ 3.	8.1/ 2.	8.1/ 2.
3.5/ 3/ 1.49	53.6/ 3/ 1.00	77.8/ 3/ 1.42	56.0/ 3/ .98
3.5/ 3/ .05	3.7/ 3/ .06	3.7/ 3/ .06	3.2/ 3/ .05
49.6/ 3/ 149.	71.9/ 2/ 72.	65.4/ 3/ 196.	74.3/ 2/ 75.
.1/ 3/ 0.	.7/ 2/ 1.	.3/ 3/ 1.	1.1/ 2/ 1.
7.75	12.88	8.84	12.76
442.	281.	488.	297.
192.	152.	401.	182.
1.44	.94	1.37	.94
148.5	71.3	195.4	71.3
19.59	21.41	21.69	22.62
172.67	23.31	35.93	28.01
2032.0	2280.4	1938.2	2268.0
22.39	18.43	29.53	17.04
3.35	3.38	3.72	3.59
29.50	3.68	6.15	4.44
347.2	359.9	331.9	359.5
3.63	2.91	5.06	3.02
17.25	16.06	15.08	16.13
505.	867.	306.	889.
5.85	6.34	5.84	6.31
.503 (.884)		.910 (.992)	
1.000 (.970)		1.000 (.970)	
208.9		209.0	
0.00		0.00	
12.19		12.15	
16.63		15.63	

COMPOSITE RESULTS

TEST NUMBER 743-31
BAROMETER MM HG 748.8
HUMIDITY G/KG 11.5
TEMPERATURE DEG C 24.4

CARBON DIOXIDE G/KM 349.4 (349.3)
FUEL CONSUMPTION L/100KM 16.04 (16.06)
HYDROCARBONS (THC) G/KM 3.46 (3.53)
CARBON MONOXIDE G/KM 9.69 (9.91)
OXIDES OF NITROGEN G/KM 3.69 (3.72)

VEHICLE EMISSIONS RESULTS - LEAN IDLE
PROJECT 11-5830-004

TEST NO. 743-3 RUN 1
VEHICLE MODEL 70 FAIRLANE FORD
ENGINE 0.0 L (0. CID) V-8
TRANSMISSION A3

VEHICLE NO. 74
DATE 10/ 6/80
BAG CART NO. 1
DYNQ NO. 3
CVS NO. 2

TEST WEIGHT 1814. KG (4000. LBS)
ACTUAL ROAD LOAD 8.9 KM (12.0 HP)
GASOLINE EM-433-F
ODOMETER ***** KM(66091. MILES)

BAROMETER 748.54 MM HG(29.47 IN HG)
RELATIVE HUMIDITY 52. PCT

DRY BULB TEMP. 24.4 DEG C(76.0 DEG F)
ASS. HUMIDITY 10.0 GM/KG

NOX HUMIDITY CORRECTION FACTOR .98

TEST CYCLE

BLOWER DIF P MM. H2O(IN. H2O)
BLOWER INLET P MM. H2O(IN. H2O)
BLOWER INLET TEMP. DEG. C(DEG. F)
BLOWER REVOLUTIONS
TOT FLOW STD. CU. METRES(SCF)
HC SAMPLE METER/RANGE/PPM
HC BCKGRD METER/RANGE/PPM
CO SAMPLE METER/RANGE/PPM
CO BCKGRD METER/RANGE/PPM
CO2 SAMPLE METER/RANGE/PCT
CO2 BCKGRD METER/RANGE/PCT
NOX SAMPLE METER/RANGE/PPM
NOX BCKGRD METER/RANGE/PPM
DILUTION FACTOR
HC CONCENTRATION PPM
CO CONCENTRATION PPM
CO2 CONCENTRATION PCT
NOX CONCENTRATION PPM
HC MASS GRAMS
CO MASS GRAMS
CO2 MASS GRAMS
NOX MASS GRAMS

RUN TIME SECONDS
DFC, WET (DRY)
SCF, WET (DRY)
VOL (SCM)
SAM BLR (SCM)
KM (MEASURED)

TEST NUMBER, 743-32
BAROMETER, MM HG 748.5
HUMIDITY, G/KG 10.0
TEMPERATURE, DEG C 24.4
CARBON DIOXIDE, G/KM 287.3
FUEL CONSUMPTION, L/100KM 12.91
HYDROCARBONS, G/KM 2.21
CARBON MONOXIDE, G/KM 5.14
OXIDES OF NITROGEN, G/KM 5.17

SET	HFET
774.7 (30.5)	787.4 (31.0)
762.0 (30.0)	762.0 (30.0)
43.3 (110.0)	43.3 (110.0)
111919.	61412.
211.9 (7482.)	116.2 (4102.)
41.2/ 3/ 412.	46.1/ 3/ 461.
1.3/ 3/ 16.	2.0/ 3/ 20.
94.7/ 11/ 484.	26.8/ 3/ 623.
1.6/ 11/ 2.	1.1/ 3/ 2.
89.6/ 3/ 1.67	45.1/ 2/ 2.01
3.1/ 3/ .05	1.8/ 2/ .07
95.9/ 3/ 288.	36.8/ 4/ 368.
.3/ 3/ 1.	.1/ 4/ 1.
7.63	6.33
398.	444.
459.	588.
1.63	1.76
286.9	31.7
48.64	29.75
113.14	79.47
6318.0	4159.8
113.76	78.62
1397.	766.
.869 (.854)	.842 (.830)
1.000 (.968)	1.000 (.966)
211.9	116.2
0.00	0.00
21.99	16.70
743-32	743-33
748.5	748.3
10.0	9.6
24.4	25.6
287.3	249.1
12.91	11.19
2.21	1.78
5.14	4.76
5.17	4.71

APPENDIX E

I/M SHORT-TEST RESULTS

TABLE E-1. CAR 71 I/M SHORT-TEST RESULTS

	Rich Best Idle			12% Misfire		
	Unmod.	With Malf.		Unmod.	With Malf.	
	<u>711-1</u>	<u>711-2</u>	<u>711-3</u>	<u>712-1</u>	<u>712-2</u>	<u>712-3</u>
<u>HC Emissions, ppm Hexane</u>						
50 mph ^a - 1800 rpm	184	184	172	149	1416	1547
Idle - Neutral	137	219	207	126	1244	1416
2500 rpm	114	137	149	103	1117	1287
Idle - Neutral	137	219	195	114	1244	1416
Idle	137	231	219	114	1117	1201
30 mph ^a - 1100 rpm	160	207	207	160	1416	1635
Idle - Neutral	137	219	207	137	1244	1416
<u>CO Emissions, Percent</u>						
50 mph ^a	0.62	0.79	0.79	0.32	0.26	0.36
Idle - Neutral	0.11	4.78	4.78	0.08	0.10	0.12
2500 rpm	0.34	0.37	0.43	0.17	0.37	0.42
Idle - Neutral	0.14	5.45	5.29	0.07	0.10	0.15
Idle	0.10	4.71	4.57	0.08	0.08	0.09
30 mph ^a	0.37	0.74	0.84	0.31	0.48	0.54
Idle - Neutral	0.14	5.21	5.06	0.09	0.10	0.13
<u>Propane Enrichment, rpm^{b,c}</u>						
A. PCV in Place	660	680	680	690	690	660
B. PCV with Propane	770	680	680	800	820	760
C. PCV Malf.	660	690	690	660	680	650
D. PCV Malf. with Prop.	790	690	690	800	820	760
E. PCV Malf.	670	670	680	680	700	660
F. PCV Malf. with Prop.	780	670	680	790	800	750
G. PCV in Place	580	580	570	580	580	580
H. PCV with Propane	640	580	570	640	630	640
I. PCV Malf.	580	590	580	580	550	580
J. PCV Malf. with Prop.	650	590	580	650	630	640
K. PCV Malf.	590	580	570	580	560	570
L. PCV Malf. with Prop.	640	580	570	640	630	630

^aCar operated in Drive.^bA. through F. in Neutral and G. through L. in Drive.^cSystem Descriptions: C, D & I, J--PCV valve removed from grommet. E, F & K, L---PCV fresh air line removed.

TABLE E-2. CAR 72 I/M SHORT TEST RESULTS
1970 DODGE CHALLENGER

	Rich Idle			12% Misfire			Lean Idle		
	Unmod.	With Malf.		Unmod.	With Malf.		Unmod.	With Malf.	
	721-1	721-2	721-3	722-1	722-2	722-3	723-1	723-2	723-3
<u>HC Emissions, ppm Hexane</u>									
50 mph ^a - 2000 rpm	219	207	278	184	1414	1503	231	266	305
Idle - Neutral	266	445	433	195	1812	1547	278	2219	2219
2500 rpm	195	254	254	160	1547	1460	207	344	501
Idle - Neutral	231	409	409	195	1946	1503	266	1992	1679
Idle - Clutch In	231	409	409	184	1635	1591	254	2082	1812
30 mph ^a - 1200 rpm	266	337	337	231	1723	1635	254	383	422
Idle - Neutral	242	421	421	207	1901	1635	278	1723	1547
<u>CO Emissions, Percent</u>									
50 mpg ^a	0.23	0.19	0.23	0.24	0.29	0.24	0.22	0.76	0.85
Idle - Neutral	0.37	7.13	7.24	0.36	0.46	0.31	0.31	0.18	0.19
2500 rpm	0.18	0.23	0.23	0.20	0.28	0.21	0.17	0.21	0.37
Idle - Neutral	0.40	7.02	7.02	0.48	0.51	0.44	0.25	0.20	0.21
Idle - Clutch In	0.47	7.02	7.24	0.54	0.55	0.46	0.29	0.19	0.20
30 mph ^a	0.10	0.39	0.56	0.10	0.26	0.12	0.10	0.10	0.11
Idle - Neutral	0.42	7.47	7.35	0.55	0.69	0.42	0.31	0.19	0.20
<u>Propane Enrichment, rpm^{b,c}</u>									
A. PCV in Place	760	740	750	750	740	760	750	750	760
B. PCV with Propane	890	740	750	840	850	850	850	1700	1700
C. PCV Malf.	750	760	770	740	730	740	730	607	680
D. PCV Malf. with Prop.	890	760	770	870	850	870	870	1750	1750
E. PCV Malf.	770	730	740	760	740	760	710	760	750
F. PCV Malf. with Prop.	880	730	740	840	830	840	810	1700	1650

^aCar operated in 3rd gear

^bA. through F. in Neutral

^cSystem Descriptions: C, D -- PCV valve removed from grommet. E, F -- PCV fresh air line removed.

TABLE E-3. CAR 73 I/M SHORT-TEST RESULTS
1970 CHEVROLET MONTE CARLO

	Rich Best Idle			12% Misfire w/o Vac. Adv.			Rich Idle	
	Unmod.	With Malf.		W/O Adv.	With Malf.		Unmod.	w/o Vac. Adv.
	731-1	731-3	731-4	732-1	732-2	732-3	733-1	731-2
<u>HC Emissions, ppm Hexane</u>								
50 mph ^a - 1900 rpm	195	219	254	219	--	1460	231	137
Idle - Neutral	114	254	290	242	--	1460	172	278
2500 rpm	103	137	149	207	1287	1330	137	126
Idle - Neutral	126	266	278	242	1416	1330	160	266
Idle	149	325	373	254	1460	1416	195	337
30 mph ^a - 1150 rpm	195	302	349	207	1460	1330	231	172
Idle - Neutral	160	278	302	242	1547	1591	195	290
<u>CO Emissions, Percent</u>								
50 mph ^a - 1900 rpm	0.66	0.84	0.84	0.37	--	0.39	0.58	0.61
Idle - Neutral	0.11	5.53	6.81	0.11	--	0.11	0.11	6.13
2500 rpm	0.54	0.74	0.67	0.60	0.49	0.54	0.44	0.54
Idle - Neutral	0.11	5.53	6.61	0.12	0.11	0.11	0.11	5.86
Idle	0.08	5.61	6.71	0.08	0.08	0.08	0.09	5.95
30 mph ^a - 1150 rpm	0.12	0.43	0.86	0.12	0.14	0.13	0.13	0.27
Idle - Neutral	0.11	5.69	6.22	0.11	0.11	0.12	0.10	5.86
<u>Propane Enrichment, rpm^{b,c}</u>								
A. PCV in Place	900	800	830	830	720	730	800	790
B. PCV with Propane	1010	800	830	1020	860	920	1030	790
C. PCV Malf.	900	780	850	800	710	710	800	810
D. PCV Malf. with Prop.	1030	780	850	1060	850	920	1040	810
E. PCV Malf.	910	790	830	820	720	730	810	780
F. PCV Malf. with Prop.	990	790	820	1020	850	910	970	780
G. PCV in Place	600	600	600	610	580	580	600	600
H. PCV with Propane	670	600	600	670	630	640	660	600
I. PCV Malf.	590	620	620	600	570	570	590	610
J. PCV Malf. with Prop.	680	620	620	680	630	650	670	610
K. PCV Malf.	610	600	600	610	580	580	610	590
L. PCV Malf. with Prop.	670	600	600	670	630	640	660	590

^aCar operated in Drive. ^bA. through F. in Neutral and G. through L. in Drive.

^cSystem Descriptions: C, D & I, J--PCV valve removed from grommet. E, F & K, L--PCV fresh air line removed.

TABLE E-4, CAR 74 I/M SHORT TEST RESULTS
1970 Ford Fairlane

	Rich Idle			12% Misfire & 10° Retard			Lean Idle		
	Unmod.	With Malf.		Unmod.	With Malf.		Unmod.	With Malf.	
	741-1	741-2	741-3	744-1	742-2	742-3	743-1	743-2	743-3
<u>HC Emissions, ppm Hexane</u>									
50 mph ^a - 2000 rpm	188	198	184	266	1503	1547	195	219	242
Idle - Neutral	382	332	445	302	1287	1503	313	1845	2209
2500 rpm	105	81	219	172	1244	1416	126	278	302
Idle - Neutral	267	342	506	207	1330	1460	242	1469	1911
Idle	218	425	591	278	1373	1416	207	963	1063
30 mph ^a -1380 rpm	183	226	579	278	1503	1547	219	313*	313
Idle - Neutral	213	337	714	207	1503	1373	207	1885	1316
<u>CO Emissions, Percent</u>									
50 mph ^a	0.40	0.50	0.52	0.26	0.35	0.37	0.48	0.37	0.36
Idle - Neutral	0.15	8.75	9.66	0.13	0.12	0.15	0.14	0.16	0.16
2500 rpm	0.32	0.31	0.39	0.16	0.27	0.29	0.27	0.34	0.22
Idle - Neutral	0.13	8.75	9.04	0.21	0.12	0.14	0.18	0.18	0.17
Idle	0.10	8.75	9.19	0.14	0.09	0.12	0.10	0.13	0.14
30 mph ^a	0.14	0.31	0.50	0.15	0.13	0.15	0.14	0.14	0.13
Idle - Neutral	0.18	8.89	9.34	0.14	0.12	0.14	0.16	0.16	0.17
<u>Propane Enrichment, rpm^{b,c}</u>									
A. PCV in Place	750	790	760	750	720	730	770	750	760
B. PCV with Propane	920	800	750	850	880	880	900	1300	1350
C. PCV Malf.	720	850	830	730	720	710	740	720	700
D. PCV Malf. with Prop.	940	850	830	870	890	890	900	1400	1400
E. PCV Malf.	750	770	730	750	720	730	760	710	700
F. PCV Malf. with Prop.	910	780	730	850	880	880	880	1400	1400
G. PCV in Place	620	610	600	610	590	600	600	630	630
H. PCV with Propane	680	610	600	640	670	670	650	840	850
I. PCV Malf.	590	650	640	600	580	580	580	580	610
J. PCV Malf. with Prop.	680	650	630	650	670	680	660	850	860
K. PCV Malf.	610	600	590	610	580	610	610	630	650
L. PCV Malf. with Prop.	670	610	590	640	660	670	650	840	850

^aCar operated in Drive. ^bA. through F. in Neutral and G. through L. in Drive.

^cSystem Descriptions: C, D & I, J--PCV valve removed from grommet. E, F & K, L--PCV fresh air line removed.

APPENDIX F

AVERAGE VALUES FOR ALL CONFIGURATIONS

TABLE F-1. CAR 71 AVERAGE RESULTS FOR THE UNMODIFIED
AND THE MALFUNCTION CONFIGURATIONS - FTP

		Average Emission Rate, mg/km (Except as Noted)			
		Unmod.	Rich Idle	12% Misfire	Unscheduled ^b
Test No.	PVM	71	711	712	712-3
Barometer,	mm Hg	748.8	745.0	753.6	748.5
Humidity,	g/kg	7.5	6.8	4.6	5.3
Temperature,	°C	23.9	25.9	25.3	25.0
Total Fuel Sulfur,	mg/km	33.70	33.80	34.88	38.45
Avg. Exh. Oxygen,	%	1.34	0.50	4.30	6.98
Carbon Dioxide,	g/km	452.8	417.3	428.9	414.3
Fuel Cons.,	l/100 km	20.70	20.76	21.43	23.62
<u>Regulated Emissions</u>					
Hydrocarbons (THC),	g/km	1.43	1.95	15.22	34.52
Carbon Monoxide,	g/km	17.59	40.01	15.80	18.83
Oxides of Nitrogen,	g/km	2.23	2.18	2.75	2.97
<u>Particulates</u>					
Total Particulates		100.71	88.62	123.86	110.77
Sulfate		0.68	0.63	0.51	0.97
<u>Compound Group Totals</u>					
Aldehydes & Ketones		37.3	44.5	254.5	295.6
Individual Hydrocarbons		698.8	970.1	3143.6	7292.3
Organic Sulfides		0.08	0.03	0.04	0.04
Organic Amines		0.08	0.18	0.40	0.34
<u>Other Compounds</u>					
Ammonia		3.82	2.98	1.88	4.78
Cyanide & Cyanogen		3.45	5.57	1.17	1.53
Hydrogen Sulfide		0.08	0.05	0.00	0.23
Tetramethyllead		0.00	0.00	0.00	0.00
Ethylene Dichloride		0.00	0.00	0.00	0.00
Tetraethyllead		--	--	--	--
Ethylene Dibromide		0.00	0.00	3.68	10.45
<u>Aldehydes & Ketones</u>					
Formaldehyde		31.87	31.20	206.24	205.25
Acetaldehyde		4.46	6.11	33.49	17.88
Acetone		0.71	6.80	8.48	4.69
Isobutyraldehyde		--	--	--	--
Methyl Ethyl Ketone		0.27	0.36	3.71	2.29
Hexanaldehyde		0.00	0.00	2.54	65.49

TABLE F-1 (Cont'd). CAR 71 AVERAGE RESULTS FOR THE UNMODIFIED
AND THE MALFUNCTION CONFIGURATIONS - FTP

	Average Emission Rate, mg/km (Except as Noted)			
	Unmod.	Rich Idle	12% Misfire	Unscheduled ^b
<u>Individual Hydrocarbons</u>				
Methane	83.02	161.94	98.79	121.41
Ethylene	158.55	223.56	355.12	440.46
Ethane	14.20	20.53	31.52	40.90
Acetylene	101.75	175.99	113.79	124.22
Propane	1.43	8.17	2.86	3.88
Propylene	65.50	85.28	234.61	305.06
Benzene	51.82	81.06	197.82	371.95
Toluene	222.54	213.53	2109.12	5884.43
<u>Organic Sulfides</u>				
Carbonyl Sulfide	0.05	0.02	0.02	0.01
Methyl Sulfide	0.03	0.01	0.02	0.03
Ethyl Sulfide	0.01	0.01	0.00	0.00
Methyl Disulfide	0.00	0.00	0.00	0.00
<u>Organic Amines</u>				
Monomethylamine	0.08	0.05	0.37	0.34
Monoethylamine	0.00	0.12	0.04	0.00
Trimethylamine	0.00	0.02	0.00	0.00
Diethylamine	0.00	0.00	0.00	0.00
Triethylamine	0.00	0.00	0.00	0.00
<u>Trace Elements^a</u>				
Lead	19.67	17.12	33.10	48.55
Bromine	12.68	9.87	15.64	18.49
Phosphorus	0.09	0.06	0.11	0.12
Silicon	0.01	0.02	0.02	0.03
Cadmium	0.01	0.01	0.02	0.03
Aluminum	0.07	0.02	0.12	0.14
Sulfur	0.18	0.04	0.57	0.97
Sodium	0.06	0.04	0.09	0.13
Magnesium	0.02	0.01	0.03	0.03
Chlorine	7.58	6.44	5.73	7.63
Zinc	0.03	0.01	0.05	0.07
Copper	0.01	0.01	0.01	0.03
Nickel				
Iron	2.20	0.22	4.51	9.88
Vanadium	0.01	0.01		
Calcium	0.05	0.05	0.06	0.05

^a This table excludes all elements having measured emissions values consistently below 0.01 mg/km.

^b Single test values of 12% misfire plus some unidentified malfunction.

TABLE F-2. CAR 71 AVERAGE RESULTS FOR THE UNMODIFIED
AND THE MALFUNCTION CONFIGURATIONS - SET

		Average Emission Rate, mg/km (Except as Noted)			
		<u>Unmod.</u>	<u>Rich Idle</u>	<u>12% Misfire</u>	<u>Unscheduled^b</u>
Test No.	PVM	71	711	712	712-3
Barometer,	mm Hg	748.3	744.5	754.3	748.5
Humidity,	g/kg	7.2	6.3	4.40	5.7
Temperature,	°C	24.5	26.4	26.4	25.6
Total Fuel Sulfur,	mg/km	23.18	23.39	24.36	27.58
Avg. Exh. Oxygen,	%	1.44	0.63	4.18	6.84
Carbon Dioxide,	g/km	321.55	310.9	308.9	306.6
Fuel Cons.,	ℓ/100 km	14.24	14.37	14.96	16.94
<u>Regulated Emissions</u>					
Hydrocarbons (THC),	g/km	0.91	1.06	10.47	24.89
Carbon Monoxide,	g/km	5.86	14.27	5.34	7.12
Oxides of Nitrogen,	g/km	2.98	2.97	3.58	3.54
<u>Particulates</u>					
Total Particulates		68.08	61.60	70.20	70.20
Sulfate		0.43	0.42	0.57	1.06
<u>Compound Group Totals</u>					
Aldehydes & Ketones		32.2	30.3	166.3	315.5
Individual Hydrocarbons		443.7	575.9	2421.4	5643.2
Organic Sulfides		0.03	0.00	0.00	0.01
Organic Amines		0.10	0.07	0.35	0.17
<u>Other Compounds</u>					
Ammonia		2.33	4.78	1.77	3.90
Cyanide & Cyanogen		1.80	1.95	0.27	0.44
Hydrogen Sulfide		0.00	0.00	0.00	0.00
Tetramethyllead		0.00	0.00	0.00	0.00
Ethylene Dichloride		0.00	0.00	0.00	0.00
Tetraethyllead		--	--	--	--
Ethylene Dibromide		0.00	0.00	2.50	5.76
<u>Aldehydes & Ketones</u>					
Formaldehyde		26.77	26.56	135.42	235.95
Acetaldehyde		4.88	3.50	20.28	43.05
Acetone		0.35	0.00	6.21	20.54
Isobutyraldehyde		--	--	--	--
Methyl Ethyl Ketone		0.14	0.20	2.20	8.56
Hexanaldehyde		0.00	0.00	2.21	7.41

TABLE F-2 (Cont'd). CAR 71 AVERAGE RESULTS FOR THE UNMODIFIED
AND THE MALFUNCTION CONFIGURATIONS - SET

	Average Emission Rate, mg/km (Except as Noted)			
	Unmod.	Rich Idle	12% Misfire	Unscheduled ^b
<u>Individual Hydrocarbons</u>				
Methane	37.86	75.05	52.94	66.92
Ethylene	128.62	160.22	309.31	415.96
Ethane	11.50	15.13	25.03	35.73
Acetylene	57.19	95.66	69.20	72.04
Propane	1.14	5.06	1.87	2.50
Propylene	52.50	61.68	213.93	308.83
Benzene	38.62	51.80	174.63	422.98
Toluene	116.24	111.33	1574.52	4318.26
<u>Organic Sulfides</u>				
Carbonyl Sulfide	0.01	0.00	0.00	0.01
Methyl Sulfide	0.02	0.00	0.00	0.00
Ethyl Sulfide	0.00	0.00	0.00	0.00
Methyl Disulfide	0.00	0.00	0.00	0.00
<u>Organic Amines</u>				
Monomethylamine	0.07	0.04	0.35	0.17
Monoethylamine	0.02	0.03	0.00	0.00
Trimethylamine	0.02	0.00	0.00	0.00
Diethylamine	0.00	0.00	0.00	0.00
Triethylamine	0.00	0.00	0.00	0.00
<u>Trace Elements^a</u>				
Lead	19.36	17.33	25.02	28.52
Bromine	17.41	13.79	14.78	11.60
Phosphorus	0.08	0.06	0.10	0.09
Silicon				
Cadmium	0.02	0.01	0.02	0.02
Aluminum	0.14	0.05	0.08	0.06
Sulfur	0.07	0.03	0.33	0.60
Sodium	0.08	0.06	0.07	0.06
Magnesium	0.02	0.01	0.02	0.02
Chlorine	6.01	4.39	4.25	4.67
Zinc	0.03		0.02	0.04
Copper	0.03			0.03
Nickel				
Iron	0.58	0.13	0.89	5.68
Vanadium		0.02		
Calcium	0.03		0.03	0.03

^a This table excludes all elements having measured emissions values consistently below 0.01 mg/km

^b Single test values of 12% misfire plus some unidentified malfunction.

TABLE F-3. CAR 71 AVERAGE RESULTS FOR THE UNMODIFIED
AND THE MALFUNCTION CONFIGURATIONS - HFET

		<u>Average Emission Rate, mg/km (Except as Noted)</u>			
		<u>Unmod.</u>	<u>Rich Idle</u>	<u>12% Misfire</u>	<u>Unscheduled^b</u>
Test No.	PVM	71	711	712	712-3
Barometer,	mm Hg	747.9	744.2	753.6	747.8
Humidity	g/kg	7.1	8.9	4.4	5.8
Temperature,	°C	25.6	27.8	25.6	26.7
Total Fuel Sulfur,	mg/km	20.35	20.19	21.84	24.49
Avg. Exh. Oxygen,	%	1.11	0.73	3.65	6.03
Carbon Dioxide,	g/km	281.5	275.0	277.2	273.1
Fuel Cons.,	ℓ/100km	12.50	12.40	13.41	15.04
<u>Regulated Emissions</u>					
Hydrocarbons (THC),	g/km	0.95	0.94	9.46	22.49
Carbon Monoxide,	g/km	5.36	7.93	4.39	5.00
Oxides of Nitrogen,	g/km	3.18	3.43	3.81	4.06
<u>Particulates</u>					
Total Particulates		69.03	53.73	72.72	64.64
Sulfate		0.39	0.17	0.46	0.99
<u>Compound Group Totals</u>					
Aldehydes & Ketones		27.0	32.6	139.5	258.4
Individual Hydrocarbons		371.7	497.2	2032.1	5156.4
Organic Sulfides		0.02	0.00	0.01	0.01
Organic Amines		0.10	0.05	0.15	0.15
<u>Other Compounds</u>					
Ammonia		5.42	3.23	2.53	9.05
Cyanide & Cyanogen		6.69	8.13	0.84	1.60
Hydrogen Sulfide		0.00	0.00	0.00	0.00
Tetramethyllead		0.00	0.00	0.00	0.00
Ethylene Dichloride		0.00	0.00	0.00	0.00
Tetraethyllead		--	--	--	--
Ethylene Dibromide		0.00	0.00	2.49	5.84
<u>Aldehydes & Ketones</u>					
Formaldehyde		22.83	28.49	122.47	210.25
Acetaldehyde		3.98	4.06	13.47	29.31
Acetone		0.15	0.00	2.73	9.88
Isobutyraldehyde		--	--	--	--
Methyl Ethyl Ketone		0.00	0.08	0.89	4.71
Hexanaldehyde		0.00	0.00	0.00	4.20

TABLE F-3 (Cont'd). CAR 71 AVERAGE RESULTS FOR THE UNMODIFIED
AND THE MALFUNCTION CONFIGURATIONS - HFET

	Average Emission Rate, mg/km (Except as Noted)			
	<u>Unmod.</u>	<u>Rich Idle</u>	<u>12% Misfire</u>	<u>Unscheduled^b</u>
<u>Individual Hydrocarbons</u>				
Methane	31.16	55.53	49.78	57.26
Ethylene	101.52	146.62	286.70	367.72
Ethane	9.92	14.58	24.31	31.72
Acetylene	48.97	79.36	71.94	69.66
Propane	0.68	2.68	1.76	2.09
Propylene	41.99	59.49	197.04	273.59
Benzene	30.58	41.21	105.28	270.07
Toluene	106.85	97.71	1295.23	4084.26
<u>Organic Sulfides</u>				
Carbonyl Sulfide	0.01	0.00	0.01	0.01
Methyl Sulfide	0.02	0.00	0.00	0.00
Ethyl Sulfide	0.00	0.00	0.00	0.00
Methyl Disulfide	0.00	0.00	0.00	0.00
<u>Organic Amines</u>				
Monomethylamine	0.09	0.01	0.14	0.15
Monoethylamine	0.01	0.05	0.01	0.00
Trimethylamine	0.00	0.00	0.00	0.00
Diethylamine	0.00	0.00	0.00	0.00
Triethylamine	0.00	0.00	0.00	0.00
<u>Trace Elements^a</u>				
Lead	14.59	16.33	21.19	24.25
Bromine	13.04	12.80	12.04	9.60
Phosphorus	0.06	0.07	0.09	0.07
Silicon				
Cadmium	0.01	0.02	0.02	0.01
Aluminum	0.05	0.04	0.02	
Sulfur	0.03	0.02	0.25	0.39
Sodium	0.06	0.06	0.06	0.05
Magnesium	0.01	0.01	0.02	0.01
Chlorine	4.68	4.29	3.89	4.52
Zinc	0.12			
Copper				
Nickel				
Iron		0.02	0.22	0.86
Vanadium		0.01	0.01	
Calcium			0.04	

^aThis table excludes all elements having measured emissions values consistently below 0.01 mg/km.

^bSingle test values of 12% misfire plus some unidentified malfunction.

TABLE F-4. CAR 72 AVERAGE RESULTS FOR THE UNMODIFIED
AND THE MALFUNCTION CONFIGURATIONS - FTP

		Average Emission Rate, mg/km (Except as Noted)			
		Unmod.	Rich Idle	12% Misfire	Lean Idle
Test No.	PVM	72	721	722	723
Barometer,	mm Hg	745.3	748.7	742.2	742.5
Humidity	g/kg	10.3	6.8	10.2	9.1
Temperature,	°C	25.20	27.0	24.4	27.0
Total Fuel Sulfur,	mg/km	20.32	20.95	21.50	20.46
Avg. Exh. Oxygen,	%	1.25	1.44	3.96	6.13
Carbon Dioxide,	g/km	256.6	237.3	244.0	258.6
Fuel Cons.,	ℓ/100 km	12.48	12.87	13.21	12.57
<u>Regulated Emissions</u>					
Hydrocarbons (THC),	g/km	1.71	2.34	9.64	3.32
Carbon Monoxide,	g/km	19.31	36.14	22.13	16.18
Oxides of Nitrogen,	g/km	1.91	1.81	2.07	1.80
<u>Particulates</u>					
Total Particulates		81.74	93.71	86.36	79.34
Sulfate		0.47	1.06	0.18	0.51
<u>Compound Group Totals</u>					
Aldehydes & Ketones		12.8	11.1	51.7	43.2
Individual Hydrocarbons		718.8	1078.5	1946.6	889.2
Organic Sulfides		0.01	0.00	0.02	0.04
Organic Amines		0.03	0.07	0.01	0.09
<u>Other Compounds</u>					
Ammonia		2.90	4.38	3.75	3.65
Cyanide & Cyanogen		5.20	9.92	2.76	4.90
Hydrogen Sulfide		0.00	0.00	0.00	0.00
Tetramethyllead		0.00	0.00	0.00	0.00
Ethylene Dichloride		0.00	0.00	0.00	0.00
Tetraethyllead		0.00	0.00	0.00	0.00
Ethylene Dibromide		0.00	0.00	2.06	0.00
<u>Aldehydes & Ketones</u>					
Formaldehyde		9.31	9.36	46.90	35.51
Acetaldehyde		3.45	1.52	4.51	7.56
Acetone		0.00	0.19	0.31	0.00
Isobutyraldehyde		--	--	--	--
Methyl Ethyl Ketone		0.00	0.00	0.00	0.00
Hexanaldehyde		0.00	0.00	0.00	0.06

TABLE F-4 (Cont'd). CAR 72 AVERAGE RESULTS FOR THE UNMODIFIED
AND THE MALFUNCTION CONFIGURATIONS - FTP

	Average Emission Rate, mg/km (Except as Noted)			
	Unmod.	Rich Idle	12% Misfire	Lean Idle
<u>Individual Hydrocarbons</u>				
Methane	98.72	193.31	115.11	72.62
Ethylene	165.7	249.00	192.90	193.13
Ethane	15.12	22.92	19.46	17.93
Acetylene	133.11	188.74	137.80	67.08
Propane	1.92	2.27	2.50	1.95
Propylene	69.66	94.33	108.40	97.78
Benzene	54.09	83.31	122.18	55.40
Toluene	180.50	244.65	1248.28	383.29
<u>Organic Sulfides</u>				
Carbonyl Sulfide	0.01	0.00	0.02	0.03
Methyl Sulfide	0.00	0.00	0.00	0.01
Ethyl Sulfide	0.00	0.00	0.00	0.00
Methyl Disulfide	0.00	0.00	0.00	0.00
<u>Organic Amines</u>				
Monomethylamine	0.02	0.01	0.01	0.08
Monoethylamine	0.01	0.05	0.01	0.01
Trimethylamine	0.01	0.01	0.00	0.00
Diethylamine	0.00	0.00	0.00	0.00
Triethylamine	0.00	0.00	0.00	0.00
<u>Trace Elements</u> ^a				
Lead	15.00	10.34	15.68	14.30
Bromine	6.59	4.50	6.24	6.68
Phosphorus	0.12	0.10	0.08	0.08
Silicon				
Cadmium	0.01		0.01	0.01
Aluminum	0.03		0.03	
Sulfur	0.20	0.13	0.24	0.12
Sodium	0.06	0.02	0.06	0.04
Magnesium	0.01	0.01	0.01	0.01
Chlorine	4.44	2.30	3.88	2.96
Zinc	0.17	0.44	0.22	0.07
Copper	0.01			
Nickel				
Iron	4.75	0.73	3.26	0.37
Vanadium		0.01		
Calcium	0.07		0.05	0.04
Cobalt	0.01			

^a This table excludes all elements having measured emissions values consistently below 0.01 mg/km.

TABLE F-5. CAR 72 AVERAGE RESULTS FOR THE UNMODIFIED
AND THE MALFUNCTION CONFIGURATION - SET

		Average Emission Rate, mg/km (Except as Noted)			
		Unmod.	Rich Idle	12% Misfire	Lean Idle
Test No.	PVM	72	721	722	723
Barometer,	mm Hg	745.3	747.7	741.6	741.5
Humidity,	g/kg	9.3	6.8	10.2	9.2
Temperature,	°C	25.2	25.6	25.6	26.2
Total Fuel Sulfur,	mg/km	15.11	15.65	16.30	15.40
Avg. Exh. Oxygen,	%	1.38	1.04	3.83	5.32
Carbon Dioxide,	g/km	205.6	202.4	199.5	208.3
Fuel Cons.,	ℓ/100 km	9.28	9.61	10.01	9.46
<u>Regulated Emissions</u>					
Hydrocarbons (THC),	g/km	0.87	1.24	7.22	1.49
Carbon Monoxide,	g/km	5.79	12.09	7.74	5.48
Oxides of Nitrogen,	g/km	2.55	2.60	2.68	2.49
<u>Particulates</u>					
Total Particulates		51.08	50.34	73.88	46.76
Sulfate		0.28	0.53	0.36	0.51
<u>Compound Group Totals</u>					
Aldehydes & Ketones		11.6	16.4	72.8*	25.9
Individual Hydrocarbons		364.2	570.1	1359.3	451.3
Organic Sulfides		0.03	0.01	0.00	0.01
Organic Amines		0.04	0.05	0.01	0.02
<u>Other Compounds</u>					
Ammonia		1.67	5.48	2.11	1.34
Cyanide & Gyanogen		3.00	5.33	0.41	3.33
Hydrogen Sulfide		0.00	0.00	0.00	0.00
Tetramethyllead		0.00	0.00	0.00	0.00
Ethylene Dichloride		0.00	0.00	0.00	0.00
Tetraethyllead		0.00	0.00	0.00	0.00
Ethylene Dibromide		0.00	0.00	1.78	0.00
<u>Aldehydes & Ketones</u>					
Formaldehyde		9.95	13.50	64.51*	22.17
Acetaldehyde		1.61	2.85	7.95*	3.72
Acetone		0.04	0.00	0.00*	0.00
Isobutyraldehyde		--	--	--	--
Methyl Ethyl Ketone		0.00	0.00	0.00*	0.00
Hexanaldehyde		0.00	0.00	0.00*	0.00

* Values are from a single run.

TABLE F-5 (Cont'd). CAR 72 AVERAGE RESULTS FOR THE UNMODIFIED
AND THE MALFUNCTION CONFIGURATION - SET

	Average Emission Rate, mg/km (Except as Noted)			
	Unmod.	Rich Idle	12% Misfire	Lean Idle
<u>Individual Hydrocarbons</u>				
Methane	36.48	80.77	52.62	31.10
Ethylene	103.24	149.58	173.30	115.59
Ethane	9.57	14.66	15.86	10.40
Acetylene	59.31	96.27	70.53	37.19
Propane	0.54	1.22	1.62	0.47
Propylene	43.03	57.77	114.11	55.74
Benzene	28.03	47.08	69.21	26.77
Toluene	83.97	122.68	862.01	174.03
<u>Organic Sulfides</u>				
Carbonyl Sulfide	0.03	0.01	0.00	0.01
Methyl Sulfide	0.00	0.00	0.00	0.00
Ethyl Sulfide	0.00	0.00	0.00	0.00
Methyl Disulfide	0.00	0.00	0.00	0.00
<u>Organic Amines</u>				
Monomethylamine	0.03	0.01	0.01	0.02
Monoethylamine	0.01	0.04	0.00	0.00
Trimethylamine	0.00	0.00	0.00	0.00
Diethylamine	0.00	0.00	0.00	0.00
Triethylamine	0.00	0.00	0.00	0.00
<u>Trace Elements^a</u>				
Lead	11.46	9.51	12.30	11.36
Bromine	7.05	5.91	5.67	7.10
Phosphorus	0.07	0.06	0.06	0.07
Silicon				
Cadmium	0.01	0.01		0.01
Aluminum	0.02	0.01	0.02	
Sulfur	0.06	0.04	0.21	0.06
Sodium	0.04	0.03	0.04	0.04
Magnesium	0.01	0.01	0.01	0.01
Chlorine	5.71	5.78		4.29
Zinc	0.07	0.05	0.14	0.05
Copper				
Nickel				
Iron	1.22	0.44	2.84	0.23
Vanadium				
Calcium	0.02	0.03	0.03	0.02

^aThis table excludes all elements having measured emissions values consistently below 0.01 mg/km.

TABLE F-6. CAR 72 AVERAGE RESULTS FOR THE UNMODIFIED
AND THE MALFUNCTION CONFIGURATIONS - HFET

		Average Emission Rate, mg/km (Except as Noted)			
		Unmod.	Rich Idle	12% Misfire	Lean Idle
Test No.	PVM	72	721	722	723
Barometer,	mm Hg	745.2	746.8	741.4	740.8
Humidity,	g/kg	9.0	6.1	9.6	8.6
Temperature,	°C	25.9	25.6	25.0	25.9
Total Fuel Sulfur,	mg/km	13.90	14.27	15.40	14.05
Avg. Exh. Oxygen,		1.62	1.39	3.76	3.42
Carbon Dioxide,		192.6	196.3	193.7	192.1
Fuel Cons.,		8.54	8.77	9.46	8.63
<u>Regulated Emissions</u>					
Hydrocarbons (THC),	g/km	0.68	0.75	6.74	0.94
Carbon Monoxide,	g/km	3.33	4.27	4.17	4.46
Oxides of Nitrogen,	g/km	2.74	2.76	3.10	2.62
<u>Particulates</u>					
Total Particulates		49.31	45.36	51.89	70.42
Sulfate		0.25	0.58	0.39	0.60
<u>Compound Group Totals</u>					
Aldehydes & Ketones		9.0	10.0	93.85	13.2
Individual Hydrocarbons		243.0	341.7	1255.7	335.4
Organic Sulfides		0.00	0.00	0.00	0.02
Organic Amines		0.03	0.01	0.02	0.02
<u>Other Compounds</u>					
Ammonia		1.69	2.90	1.74	3.23
Cyanide & Cyanogen		6.97	8.63	1.23	8.49
Hydrogen Sulfide		0.00	0.00	0.00	0.00
Tetramethyllead		0.00	0.00	0.00	0.00
Ethylene Dichloride		0.00	0.00	0.00	0.00
Tetraethyllead		0.00	0.00	0.00	0.00
Ethylene Dibromide		0.00	0.00	1.77	0.00
<u>Aldehydes & Ketones</u>					
Formaldehyde		7.13	9.74	79.71	11.37
Acetaldehyde		1.72	0.23	11.38	1.75
Acetone		0.09	0.00	1.63	0.00
Isobutyraldehyde		--	--	--	--
Methyl Ethyl Ketone		0.00	0.00	0.00	0.00
Hexanaldehyde		0.00	0.00	1.14	0.00

TABLE F-6 (Cont'd). CAR 72 AVERAGE RESULTS FOR THE UNMODIFIED
AND THE MALFUNCTION CONFIGURATIONS - HFET

	Average Emission Rate, mg/km (Except as Noted)			
	Unmod.	Rich Idle	12% Misfire	Lean Idle
<u>Individual Hydrocarbons</u>				
Methane	19.51	34.70	35.86	27.02
Ethylene	72.64	100.96	167.15	92.17
Ethane	6.12	9.55	14.17	8.34
Acetylene	38.20	54.67	57.02	38.41
Propane	0.09	0.82	1.25	0.57
Propylene	30.90	41.60	119.01	41.52
Benzene	19.18	26.43	70.83	24.03
Toluene	56.37	72.92	790.41	103.36
<u>Organic Sulfides</u>				
Carbonyl Sulfide	0.00	0.00	0.00	0.01
Methyl Sulfide	0.00	0.00	0.00	0.01
Ethyl Sulfide	0.00	0.00	0.00	0.00
Methyl Disulfide	0.00	0.00	0.00	0.00
<u>Organic Amines</u>				
Monomethylamine	0.01	0.01	0.01	0.02
Monoethylamine	0.01	0.00	0.01	0.00
Trimethylamine	0.00	0.00	0.00	0.00
Diethylamine	0.00	0.00	0.00	0.00
Triethylamine	0.00	0.00	0.00	0.00
<u>Trace Elements</u> ^a				
Lead	9.20	10.71	10.23	16.87
Bromine	6.46	8.09	5.20	9.78
Phosphorus	0.06	0.06	0.06	0.08
Silicon				
Cadmium	0.01	0.01	0.01	0.01
Aluminum				
Sulfur	0.04	0.04	0.14	0.11
Sodium	0.03	0.03	0.04	0.05
Magnesium	0.01	0.01	0.01	0.01
Chlorine	6.44	7.91	2.90	5.58
Zinc	0.03	0.04	0.08	0.06
Copper				
Nickel				
Iron	0.49	0.28	0.71	0.69
Vanadium		0.01		
Calcium	0.01		0.01	0.02

^aThis table excludes all elements having measured emissions values consistently below 0.01 mg/km.

TABLE F-7. CAR 73 AVERAGE RESULTS FOR THE UNMODIFIED
AND THE MALFUNCTION CONFIGURATIONS - FTP

		Average Emission Rate, mg/km (Except as Noted)		
		Unmod.	Rich Idle	12% Misfire
Test No.	PVM	73	731	732
Barometer,	mm Hg	749.2	743.1	741.0
Humidity,	g/kg	5.2	7.7	9.7
Temperature,	°C	24.4	24.8	25.9
Total Fuel Sulfur, mg/km		28.89	29.60	31.11
Avg. Exh. Oxygen, %		1.74	0.76	--
Carbon Dioxide, g/km		380.8	335.1	381.6
Fuel Cons., l/100 km		17.75	18.18	19.11
<u>Regulated Emissions</u>				
Hydrocarbons (THC), g/km		2.05	2.92	14.04
Carbon Monoxide, g/km		18.07	51.93	13.78
Oxides of Nitrogen, g/km		2.64	2.28	1.90
<u>Particulates</u>				
Total Particulates		114.55	111.15	222.29
Sulfate		1.11	0.64	2.50
<u>Compound Group Totals</u>				
Aldehydes & Ketones		73.5	51.9	228.3
Individual Hydrocarbons		789.9	1182.6	2996.9
Organic Sulfides		0.22	0.17	0.08
Organic Amines		0.03	0.18	0.15
<u>Other Compounds</u>				
Ammonia		5.72	2.69	4.71
Cyanide & Cyanogen		3.60	5.29	1.76
Hydrogen Sulfide		0.05	0.05	0.00
Tetramethyllead		0.00	0.00	0.00
Ethylene Dichloride		0.00	0.00	0.00
Tetraethyllead		--	--	0.00
Ethylene Dibromide		0.00	0.00	3.02
<u>Aldehydes & Ketones</u>				
Formaldehyde		66.77	45.27	177.97
Acetaldehyde		6.74	5.96	34.29
Acetone		0.00	0.31	12.05
Isobutyraldehyde		--	--	--
Methyl Ethyl Ketone		0.00	0.32	2.83
Hexanaldehyde		0.00	0.00	2.15

* One run only

TABLE F-7 (Cont'd). CAR 73 AVERAGE RESULTS FOR THE UNMODIFIED
AND THE MALFUNCTION CONFIGURATIONS - FTP

	Average Emission Rate, mg/km (Except as Noted)		
	<u>Unmod.</u>	<u>Rich Idle</u>	<u>12% Misfire</u>
<u>Individual Hydrocarbons</u>			
Methane	84.48	187.10	87.20
Ethylene	218.45	282.32	367.26
Ethane	18.26	25.30	30.07
Acetylene	89.34	165.33	94.19
Propane	5.96	2.40	2.60
Propylene	102.08	120.03	232.80
Benzene	56.94	87.79	200.55
Toluene	214.35	312.33	1981.21
<u>Organic Sulfides</u>			
Carbonyl Sulfide	0.18	0.06	0.01
Methyl Sulfide	0.04	0.10	0.07
Ethyl Sulfide	0.01	0.01	0.00
Methyl Disulfide	0.00	0.01	0.00
<u>Organic Amines</u>			
Monomethylamine	0.03	0.18	0.15
Monoethylamine	0.00	0.00	0.00
Trimethylamine	0.00	0.00	0.00
Diethylamine	0.00	0.00	0.00
Triethylamine			
<u>Trace Elements</u> ^a			
Lead	20.26	16.56	35.38
Bromine	8.89	7.66	13.24
Phosphorus	0.15	0.08	0.23
Silicon			
Cadmium			0.01
Aluminum	0.22	0.25	0.36
Sulfur	0.53	0.42	1.28
Sodium	0.02	0.02	0.11
Magnesium	0.02	0.01	0.05
Chlorine	2.49	2.46	3.23
Zinc	0.07		0.26
Copper			0.05
Nickel			
Iron	3.43	1.21	15.23
Vanadium	0.01		0.01
Calcium	0.09	0.02	0.29

^a This table excludes all elements having measured emissions values consistently below 0.01 mg/km.

TABLE F-8. CAR 73 AVERAGE RESULTS FOR THE UNMODIFIED
AND THE MALFUNCTION CONFIGURATIONS - SET

		Average Emission Rate, mg/km (Except as Noted)		
		Unmod.	Rich Idle	12% Misfire
Test No.	PVM	73	731	732
Barometer,	mm Hg	749.3	742.7	740.4
Humidity,	g/kg	5.4	7.2	8.7
Temperature,	°C	27.0	25.3	25.0
Total Fuel Sulfur, mg/km		20.17	20.40	23.02
Avg. Exh. Oxygen, %		2.15	0.95	--
Carbon Dioxide, g/km		278.4	262.0	291.8
Fuel Cons., l/100 km		12.39	12.53	14.14
<u>Regulated Emissions</u>				
Hydrocarbons (THC), g/km		1.23	1.64	9.86
Carbon Monoxide, g/km		5.06	16.74	5.24
Oxides of Nitrogen, g/km		3.24	3.26	1.92
<u>Particulates</u>				
Total Particulates		67.79	66.47	144.61
Sulfate		0.29	0.39	1.49
<u>Compound Group Totals</u>				
Aldehydes & Ketones		37.6*	34.0	163.20
Individual Hydrocarbons		524.3	753.4	2090.8
Organic Sulfides		0.10	0.02	0.01
Organic Amines		0.06	0.17	0.07
<u>Other Compounds</u>				
Ammonia		2.70	5.43	2.81
Cyanide & Cyanogen		1.69	4.87	0.46
Hydrogen Sulfide		0.00	0.00	0.00
Tetramethyllead		0.00	0.00	0.00
Ethylene Dichloride		0.00*	0.00*	0.00
Tetraethyllead		--	--	0.00
Ethylene Dibromide		0.00	0.00	1.83
<u>Aldehydes & Ketones</u>				
Formaldehyde		34.77*	32.68	136.53
Acetaldehyde		2.79*	1.10	19.65
Acetone		0.00*	0.25	4.36
Isobutyraldehyde		--	--	--
Methyl Ethyl Ketone		0.00*	0.00	1.53
Hexanaldehyde		0.00*	0.00	0.67

* One run only

TABLE F-8 (Cont'd). CAR 73 AVERAGE RESULTS FOR THE UNMODIFIED
AND THE MALFUNCTION CONFIGURATIONS - SET

	Average Emission Rate, mg/km (Except as Noted)		
	Unmod.	Rate Idle	12% Misfire
<u>Individual Hydrocarbons</u>			
Methane	39.92	87.81	53.55
Ethylene	171.64	219.97	343.12
Ethane	13.86	20.34	26.05
Acetylene	55.99	102.24	65.27
Propane	0.57	1.33	1.90
Propylene	78.12	92.40	231.09
Benzene	39.43	59.82	102.50
Toluene	124.79	169.47	1267.24
<u>Organic Sulfides</u>			
Carbonyl Sulfide	0.08	0.01	0.01
Methyl Sulfide	0.02	0.01	0.00
Ethyl Sulfide	0.00	0.00	0.00
Methyl Disulfide	0.00	0.00	0.00
<u>Organic Amines</u>			
Monomethylamine	0.06	0.16	0.07
Monoethylamine	0.00	0.01	0.00
Trimethylamine	0.00	0.00	0.00
Diethylamine	0.00	0.00	0.00
Triethylamine	0.00	0.00	0.00
<u>Trace Elements</u> ^a			
Lead	17.26	13.67	24.83
Bromine	6.49	8.57	10.79
Phosphorus	0.17	0.12	0.16
Silicon	0.02		
Cadmium	0.01	0.01	0.01
Aluminum	0.15	0.05	0.48
Sulfur	0.14	0.07	0.89
Sodium	0.07	0.04	0.11
Magnesium	0.02	0.01	0.04
Chlorine	3.28	2.98	2.41
Zinc	0.08	0.05	0.24
Copper	0.01		0.02
Nickel			
Iron	2.17	0.44	20.32
Vanadium	0.01		0.01
Calcium	0.06	0.04	0.07

^aThis table excludes all elements having measured emissions values consistently below 0.01 mg/km.

TABLE F-9. CAR 73 AVERAGE RESULTS FOR THE UNMODIFIED
AND THE MALFUNCTION CONFIGURATIONS - HFET

		Average Emission Rate, mg/km (Except as Noted)		
		Unmod.	Rich Idle	12% Misfire
Test No.	PVM	73	731	732
Barometer,	mm Hg	748.8	742.2	740.2
Humidity,	g/kg	6.0	7.4	8.8
Temperature,	°C	29.2	27.0	27.0
Total Fuel Sulfur, mg/km		17.92	18.02	21.04
Avg. Exh. Oxygen, %		1.84	0.95	---
Carbon Dioxide, g/km		245.5	240.9	268.5
Fuel Cons., l/100 km		11.01	11.07	12.93
<u>Regulated Emissions</u>				
Hydrocarbons (THC), g/km		1.26	1.49	8.60
Carbon Monoxide, g/km		5.44	8.71	4.56
Oxides of Nitrogen, g/km		3.58	3.61	1.89
<u>Particulates</u>				
Total Particulates		80.23	93.43	118.30
Sulfate		0.62	0.43	1.11
<u>Compound Group Totals</u>				
Aldehydes & Ketones		34.8	39.5	199.7
Individual Hydrocarbons		541.9	676.9	1907.6
Organic Sulfides		0.06	0.03	0.01
Organic Amines		0.04	0.28	0.05
<u>Other Compounds</u>				
Ammonia		2.58	3.13	3.85
Cyanide & Cyanogen		4.57	7.81	2.25
Hydrogen Sulfide		0.00	0.00	0.00
Tetramethyllead		0.00	0.00	0.00
Ethylene Dichloride		0.00	0.00	0.00
Tetraethyllead		--	--	0.00
Ethylene Dibromide		0.00	0.00	3.57
<u>Aldehydes & Ketones</u>				
Formaldehyde		30.87*	36.46	173.17
Acetaldehyde		3.71*	2.76	19.08
Acetone		0.00*	0.26	5.91
Isobutyraldehyde		--	--	--
Methyl Ethyl Ketone		0.23*	0.00	1.54
Hexanaldehyde		0.00	0.00	0.00

* One run only

TABLE F-9 (Cont'd). CAR 73 AVERAGE RESULTS FOR THE UNMODIFIED
AND MALFUNCTION CONFIGURATIONS - HFET

	Average Emission Rate, mg/km (Except as Noted)		
	<u>Unmod.</u>	<u>Rich Idle</u>	<u>12% Misfire</u>
<u>Individual Hydrocarbons</u>			
Methane	45.56	67.60	53.31
Ethylene	174.96	206.85	346.06
Ethane	14.88	19.77	26.15
Acetylene	66.53	96.77	69.11
Propane	1.12	1.10	1.87
Propylene	78.24	90.94	230.52
Benzene	39.98	49.26	104.35
Toluene	120.59	144.58	1076.22
<u>Organic Sulfides</u>			
Carbonyl Sulfide	0.03	0.01	0.01
Methyl Sulfide	0.03	0.02	0.01
Ethyl Sulfide	0.00	0.00	0.00
Methyl Disulfide	0.00	0.00	0.00
<u>Organic Amines</u>			
Monomethylamine	0.02	0.18	0.05
Monoethylamine	0.01	0.10	0.00
Trimethylamine	0.01	0.00	0.00
Diethylamine	0.00	0.00	0.00
Triethylamine	0.00	0.00	0.00
<u>Trace Elements^a</u>			
Lead	11.67	10.36	19.37
Bromine	6.72	5.86	9.82
Phosphorus	0.17	0.15	0.13
Silicon			
Cadmium		0.01	0.01
Aluminum	0.05		0.17
Sulfur	0.10	0.06	0.54
Sodium	0.03	0.03	0.06
Magnesium	0.02	0.01	0.02
Chlorine	1.97	2.07	2.00
Zinc	0.08	0.04	0.15
Copper			0.02
Nickel			
Iron	1.23	0.08	5.63
Vanadium		0.01	
Calcium	0.07	0.03	0.05

^a This table excludes all elements having measured emissions values consistently below 0.01 mg/km.

TABLE F-10. CAR 74 AVERAGE RESULTS FOR THE UNMODIFIED
AND THE MALFUNCTION CONFIGURATIONS - FTP

		Average Emission Rate, mg/km (Except as Noted)			
		Unmod.	Rich Idle	12% Misfire ^b	Lean Idle
Test No.	PVM	71	741	742	743
Barometer,	mm Hg	743.87	739.7	741.6	747.9
Humidity,	g/kg	10.9	12.0	12.8	9.4
Temperature,	°C	24.4	25.3	25.3	24.7
Total Fuel Sulfur, mg/km		26.51	29.32	31.10	26.04
Avg. Exh. Oxy.,	%	1.37	1.03	3.44	4.36
Carbon Dioxide,	g/km	353.5	317.00	373.8	349.25
Fuel Cons.,	ℓ/100 km	16.28	18.01	19.1	16.00
<u>Regulated Emissions</u>					
Hydrocarbons (THC),	g/km	2.35	3.75	14.93	3.27
Carbon Monoxide,	g/km	13.04	50.07	16.87	9.62
Oxides of Nitrogen,	g/km	3.66	3.32	3.42	3.74
<u>Particulates</u>					
Total Particulates		95.57	111.78	179.27	91.05
Sulfate		0.27	0.45	0.93	0.50
<u>Compound Group Totals</u>					
Aldehydes & Ketones		22.8	22.7	92.3	20.7
Individual Hydrocarbons		848.7	1698.6	3566.4	1029.4
Organic Sulfides		0.00	0.26	0.06	0.10
Organic Amines		0.04	0.02	0.01	0.03
<u>Other Compounds</u>					
Ammonia		4.78	4.72	16.60	3.52
Cyanide & Cyanogen		0.88	2.17	0.40	2.02
Hydrogen Sulfide		0.00	0.00	0.00	0.00
Tetramethyllead		0.00	0.00	0.00	0.00
Ethylene Dichloride		0.00	0.00	0.00	0.00
Tetraethyllead		0.00	0.00	0.00	0.00
Ethylene Dibromide		0.00	0.00	3.81	0.00
<u>Aldehydes & Ketones</u>					
Formaldehyde		21.29	20.11	87.97	19.04
Acetaldehyde		1.42	2.56	2.44	1.58
Acetone		0.23	0.06	0.14	0.05
Isobutyraldehyde		--	--	--	--
Methyl Ethyl Ketone		0.00	0.00	0.00	0.00
Hexanaldehyde		0.00	0.00	1.72	0.00

TABLE F-10 (Cont'd). CAR 74 AVERAGE RESULTS FOR THE UNMODIFIED
AND THE MALFUNCTION CONFIGURATIONS - FTP

	Average Emission Rate, mg/km (Except as Noted)			
	Unmod.	Rich Idle	12% Misfire ^b	Lean Idle
<u>Individual Hydrocarbons</u>				
Methane	76.86	352.98	109.54	67.12
Ethylene	247.81	368.66	272.15	292.96
Ethane	23.30	32.42	31.58	24.04
Acetylene	77.35	344.26	109.65	59.94
Propane	2.56	3.22	3.92	2.53
Propylene	132.21	159.06	260.04	163.11
Benzene	53.41	93.26	182.59	59.67
Toluene	235.15	344.73	2496.99	360.07
<u>Organic Sulfides</u>				
Carbonyl Sulfide	0.00	0.26	0.06	0.05
Methyl Sulfide	0.00	0.00	0.00	0.00
Ethyl Sulfide	0.00	0.00	0.00	0.00
Methyl Disulfide	0.00	0.00	0.00	0.00
<u>Organic Amines</u>				
Monomethylamine	0.04	0.01	0.01	0.03
Monoethylamine	0.02	0.01	0.00	0.00
Trimethylamine	0.00	0.00	0.00	0.00
Diethylamine	0.00	0.00	0.00	0.00
Triethylamine	0.00	0.00	0.00	0.00
<u>Trace Elements^a</u>				
Lead	19.39	25.01	33.40	19.33
Bromine	8.82	11.28	13.05	9.14
Phosphorus	0.23	0.21	0.28	0.21
Silicon			0.02	
Cadmium		0.01		0.01
Aluminum			0.11	
Sulfur	0.13	0.20	0.82	0.11
Sodium	0.07	0.08	0.07	0.07
Magnesium	0.02	0.03	0.04	0.02
Chlorine	3.74	6.69	4.94	3.28
Zinc	0.11	0.11	0.18	0.10
Copper			0.04	0.01
Nickel				
Iron	0.59	1.14	12.63	0.29
Vanadium				
Calcium	0.18	0.16	0.19	0.16

^a This table excludes all elements having measured emissions
values consistently below 0.01 mg/km.

^b 12% misfire and 10° ignition retard.

TABLE F-11. CAR 74 AVERAGE RESULTS FOR THE UNMODIFIED
AND THE MALFUNCTION CONFIGURATIONS - SET

		Average Emission Rate, mg/km (Except as Noted)			
		Unmod.	Rich Idle	12% Misfire ^b	Lean Idle
Test No.	PVM	74	741	742	743
Barometer,	mm Hg	743.9	740.1	742.1	747.9
Humidity,	g/kg	9.9	11.4	11.4	8.7
Temperature,	°C	24.4	25.9	25.0	24.4
Total Fuel Sulfur,	mg/km	20.22	21.6	23.90	20.4
Avg. Exh. Oxygen,	%	1.43	0.99	3.49	3.76
Carbon Dioxide,	g/km	276.27	270.2	293.3	279.4
Fuel Cons.,	ℓ/100 km	12.42	13.28	14.68	12.54
<u>Regulated Emissions</u>					
Hydrocarbons (THC),	g/km	1.63	2.10	11.63	2.18
Carbon Monoxide,	g/km	6.06	21.83	8.73	4.75
Oxides of Nitrogen,	g/km	4.33	4.49	4.14	4.71
<u>Particulates</u>					
Total Particulates		78.53	102.04	124.58	90.96
Sulfate		0.49	0.51	0.82	0.68
<u>Compound Group Totals</u>					
Aldehydes & Ketones		16.3	26.4	117.5	10.25
Individual Hydrocarbons		674.3	976.8	2790.40	739.20
Organic Sulfides		0.00	0.2	0.06	0.05
Organic Amines		0.01	0.00	0.02	0.01
<u>Other Compounds</u>					
Ammonia		2.78	6.01	10.64	4.69
Cyanide & Cyanogen		1.66	0.44	0.28	0.78
Hydrogen Sulfide		0.00	0.00	0.00	0.00
Tetramethyllead		0.00	0.00	0.00	0.00
Ethylene Dichloride		0.00	0.00	0.00	0.00
Tetraethyllead		0.00	0.00	0.00	0.00
Ethylene Dibromide		0.00	0.00	3.65	0.00
<u>Aldehydes & Ketones</u>					
Formaldehyde		15.01	24.20	108.04	9.33
Acetaldehyde		1.08	2.11	2.74	0.90
Acetone		0.24	0.05	5.99	0.00
Isobutyraldehyde		--	--	--	--
Methyl Ethyl Ketone		0.00	0.00	0.73	0.00
Hexanaldehyde		0.00	0.00	0.00	0.00

TABLE F-11(Cont'd). CAR 74 AVERAGE RESULTS FOR THE UNMODIFIED
AND THE MALFUNCTION CONFIGURATIONS - SET

	Average Emission Rate, mg/km (Except as Noted)			
	Unmod.	Rich Idle	12% Misfire ^b	Lean Idle
<u>Individual Hydrocarbons</u>				
Methane	52.39	133.09	79.71	48.86
Ethylene	208.62	276.61	386.31	243.28
Ethane	19.07	25.33	31.13	19.32
Acetylene	62.59	142.59	83.19	60.79
Propane	1.68	1.93	5.77	1.85
Propylene	108.27	128.01	281.85	127.68
Benzene	48.12	61.00	152.98	44.78
Toluene	173.53	208.26	1769.45	192.68
<u>Organic Sulfides</u>				
Carbonyl Sulfide	0.00	0.02	0.06	0.05
Methyl Sulfide	0.00	0.01	0.00	0.00
Ethyl Sulfide	0.00	0.00	0.00	0.00
Methyl Disulfide	0.00	0.00	0.00	0.00
<u>Organic Amines</u>				
Monomethylamine	0.01	0.00	0.02	0.01
Monoethylamine	0.00	0.00	0.00	0.01
Trimethylamine	0.00	0.00	0.00	0.00
Diethylamine	0.00	0.00	0.00	0.00
Triethylamine	0.00	0.00	0.00	0.00
<u>Trace Elements^a</u>				
Lead	30.80	24.23	17.98	30.16
Bromine	17.45	13.97	8.14	18.65
Phosphorus	0.28	0.19	0.16	0.23
Silicon				
Cadmium	0.02	0.02	0.01	0.02
Aluminum	0.07	0.03	0.02	0.07
Sulfur	0.18	0.12	0.35	0.16
Sodium	0.13	0.09	0.07	0.11
Magnesium	0.04	0.03	0.02	0.03
Chlorine	6.52	5.97	2.82	5.44
Zinc	0.22	0.11	0.11	0.14
Copper				0.02
Nickel				
Iron	0.73	0.55	2.74	0.34
Vanadium				
Calcium	0.25	0.14	0.11	0.18

^a This table excludes all elements having measured emissions values consistently below 0.01 mg/km.

^b 12% misfire and 10° ignition retard.

TABLE F-12. CAR 74 AVERAGE RESULTS FOR THE UNMODIFIED
AND THE MALFUNCTION CONFIGURATIONS - HFET

		Average Emission Rate, mg/km (Except as Noted)			
		Unmod.	Rich Idle	12% Misfire ^b	Lean Idle
Test No.	PVM	74	741	742	743
Barometer,	mm Hg	743.8	740.1	742.2	747.7
Humidity,	g/kg	10.2	11.2	11.1	8.4
Temperature,	°C	25.6	26.4	25.6	25.3
Total Fuel Sulfur,	mg/km	17.91	18.63	20.26	17.68
Avg. Exh. Oxygen,	%	1.41	1.13	3.38	2.59
Carbon Dioxide,	g/km	243.8	247.8	250.45	242.00
Fuel Cons.,	ℓ/100 km	11.00	11.44	12.44	10.86
<u>Regulated Emissions</u>					
Hydrocarbons (THC),	g/km	1.59	1.75	10.06	1.72
Carbon Monoxide,	g/km	5.69	9.31	5.81	4.36
Oxides of Nitrogen,	g/km	4.24	4.30	3.91	4.34
<u>Particulates</u>					
Total Particulates		73.3	100.6	119.78	79.90
Sulfate		0.31	0.48	0.81	0.27
<u>Compound Group Totals</u>					
Aldehydes & Ketones		27.0	22.2	42.0	14.6
Individual Hydrocarbons		670.2	807.9	2492.3	684.0
Organic Sulfides		0.00	0.00	0.11	0.00
Organic Amines		0.00	0.00	0.05	0.02
<u>Other Compounds</u>					
Ammonia		5.63	7.84	10.18	4.41
Cyanide & Cyanogen		5.14	0.91	0.73	3.96
Hydrogen Sulfide		0.00	0.00	0.00	0.00
Tetramethyllead		0.00	0.00	0.00	0.00
Ethylene Dichloride		0.00	0.00	0.00	0.00
Tetraethyllead		0.00	0.00	0.00	0.00
Ethylene Dibromide		0.00	0.00	3.64	0.00
<u>Aldehydes & Ketones</u>					
Formaldehyde		26.10	20.33	32.43	13.75
Acetaldehyde		0.73	1.83	7.47	0.84
Acetone		0.20	0.00	0.00	0.00
Isobutyraldehyde		--	--	--	--
Methyl Ethyl Ketone		0.00	0.00	1.26	0.00
Hexanaldehyde		0.00	0.00	0.84	0.00

TABLE F-12 (Cont'd). CAR 74 AVERAGE RESULTS FOR THE UNMODIFIED
AND THE MALFUNCTION CONFIGURATIONS - HFET

	Average Emission Rate, mg/km (Except as Noted)			
	<u>Unmod.</u>	<u>Rich Idle</u>	<u>12% Misfire^b</u>	<u>Lean Idle</u>
<u>Individual Hydrocarbons</u>				
Methane	51.29	79.69	66.56	46.80
Ethylene	207.63	246.81	352.88	216.40
Ethane	19.71	24.41	29.41	18.34
Acetylene	71.32	102.79	83.24	66.69
Propane	1.48	1.53	6.66	1.35
Propylene	105.40	119.96	254.48	110.55
Benzene	48.04	55.59	36.50	43.87
Toluene	165.40	177.16	1573.80	180.02
<u>Organic Sulfides</u>				
Carbonyl Sulfide	0.00	0.00	0.07	0.00
Methyl Sulfide	0.00	0.00	0.04	0.00
Ethyl Sulfide	0.00	0.00	0.00	0.00
Methyl Disulfide	0.00	0.00	0.00	0.00
<u>Organic Amines</u>				
Monomethylamine	0.00	0.00	0.05	0.02
Monoethylamine	0.00	0.00	0.00	0.00
Trimethylamine	0.00	0.00	0.00	0.00
Diethylamine	0.00	0.00	0.00	0.00
Triethylamine	0.00	0.00	0.00	0.00
<u>Trace Elements^a</u>				
Lead	17.50	25.08	18.11	23.79
Bromine	12.04	15.23	9.09	16.73
Phosphorus	0.11	0.09	0.15	0.13
Silicon				
Cadmium	0.01	0.02	0.01	0.01
Aluminum	0.02	0.06	0.02	0.04
Sulfur	0.04	0.07	0.32	0.06
Sodium	0.06	0.08	0.05	0.08
Magnesium	0.02	0.02	0.02	0.02
Chlorine	5.27	5.81	2.83	6.26
Zinc	0.05	0.06	0.07	0.06
Copper		0.01	0.04	
Nickel				
Iron	0.15	0.33	3.11	0.12
Vanadium		0.01		
Calcium	0.06	0.05	0.06	0.08

^a This table excludes all elements having measured emissions

^b values consistently below 0.01 mg/km.

12% misfire and 10° ignition retard.

TECHNICAL REPORT DATA

(Please read Instructions on the reverse before completing)

1. REPORT NO. EPA-460/3-81-020		2.	3. RECIPIENT'S ACCESSION NO.	
4. TITLE AND SUBTITLE Unregulated Exhaust Emissions from Non-Catalyst Baseline Cars Under Malfunction Conditions			5. REPORT DATE May 1981	
			6. PERFORMING ORGANIZATION CODE	
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15. SUPPLEMENTARY NOTES				
16. ABSTRACT This report describes the laboratory effort to characterize regulated and unregulated exhaust emissions from 1970 model non-catalyst gasoline automobiles operating under malfunction conditions. Four automobiles were evaluated over three driving schedules in the unmodified configuration and in up to three engine and/or emission control system malfunction configurations. Exhaust emission constituents measured, in addition to the currently regulated emissions, include: particulates, sulfates, aldehydes, sulfides, amines, metals and several additional elements and compounds. Additional evaluations, in each of the configurations, involved the measurement of the regulated emissions over four short-test procedures.				
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