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PERFORMANCE CHARACTERISTICS OF AUTOMOTIVE ENGINES
IN THE UNITED STATES

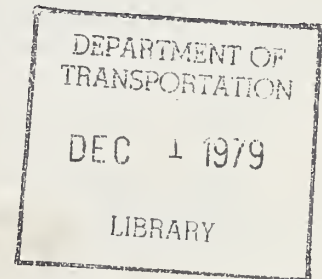
Third Series - Report No. 12
1978 Ford 140 CID (2.3 Liters), 2V

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U.S. DEPARTMENT OF ENERGY
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INTERIM REPORT



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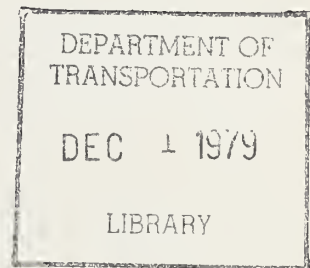
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16. Abstract Experimental data were obtained in dynamometer tests of a 1978 Ford 140 CID engine to determine fuel consumption and emissions (hydrocarbon, carbon monoxide, oxides of nitrogen) at steady-state engine operating modes. The objective of the program is to obtain engine performance data for estimating emissions and fuel economy for varied engine service and duty. The intent of the work is to provide basic engine characteristic data required as input for engineering calculations involving ground transportation.					
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PREFACE

This report, prepared by the U.S. Department of Energy, Bartlesville Energy Technology Center for the U.S. Department of Transportation, Transportation Systems Center, Energy Technology Branch, Cambridge MA, presents results of experimental work to obtain information on performance characteristics of an engine used in automobiles sold in the United States.

This project is funded by the National Highway Traffic Safety Administration, Office of Research and Development, Office of Passenger Vehicle Research, Technology Assessment Division.

James A. Kidd, Jr. of the U.S. Department of Transportation, Transportation Systems Center, is the technical monitor.

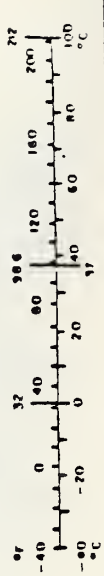
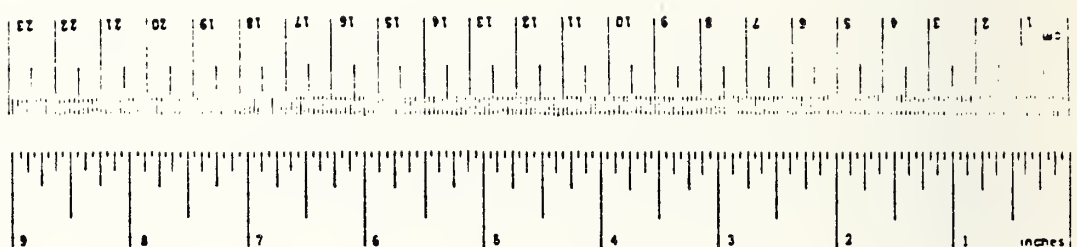
METRIC CONVERSION FACTORS

Approximate Conversions to Metric Measures

Symbol	When You Know	Multiply by	To find	Symbol
LENGTH				
m	inches	2.5	Centimeters	cm
ft	feet	30	Centimeters	cm
yd	yards	0.9	meters	m
mi	miles	1.6	kilometers	km
AREA				
m ²	square inches	6.5	square centimeters	cm ²
ft ²	square feet	0.09	square meters	m ²
yd ²	square yards	0.8	square meters	m ²
mi ²	square miles	2.6	square kilometers	km ²
	acres	0.4	hectares	ha
MASS (weight)				
oz	ounces	28	grams	g
lb	pounds	0.45	kilograms	kg
	short tons	0.9	tonnes	t
	(2000 lb)			
VOLUME				
teaspoon	teaspoons	5	milliliters	ml
tablespoon	tablespoons	15	milliliters	ml
fluid ounce	fluid ounces	30	milliliters	ml
c	Cups	0.24	liters	l
pt	pints	0.47	liters	l
qt	quarts	0.95	liters	l
gal	gallons	3.8	liters	l
ft ³	Cubic feet	0.03	Cubic meters	m ³
yd ³	Cubic yards	0.76	Cubic meters	m ³
TEMPERATURE (exact)				
°F	Fahrenheit temperature	5/9 (after subtracting 32)	Celsius temperature	°C

Approximate Conversions from Metric Measures

Symbol	When You Know	Multiply by	To find	Symbol
LENGTH				
mm	millimeters	0.04	inches	in
cm	Centimeters	0.4	inches	in
m	meters	3.3	feet	ft
m	meters	1.1	yards	yd
km	kilometers	0.6	miles	mi
AREA				
cm ²	square centimeters	0.16	square inches	in ²
m ²	square meters	1.2	square yards	yd ²
km ²	square kilometers	0.4	square miles	mi ²
ha	hectares (10,000 m ²)	2.5	acres	ac
MASS (weight)				
g	grams	0.035	ounces	oz
kg	kilograms	2.2	pounds	lb
t	tonnes (1000 kg)	1.1	short tons	sh
VOLUME				
ml	milliliters	0.03	fluid ounces	fl oz
l	liters	2.1	pints	pt
l	liters	1.06	quarts	qt
l	liters	0.76	gallons	gal
m ³	Cubic meters	35	Cubic feet	ft ³
m ³	Cubic meters	1.3	Cubic yards	yd ³
TEMPERATURE (exact)				
°C	Celsius temperature	9/5 (then add 32)	Fahrenheit temperature	°F



* In a 2 1/2 inch by 3 1/2 inch size, the units are: Centimeters, inches, feet, yards, miles, square centimeters, square inches, square feet, square yards, square miles, hectares, acres, grams, ounces, pounds, short tons, kilograms, tonnes, milliliters, fluid ounces, cups, pints, quarts, gallons, cubic feet, cubic yards.

1. INTRODUCTION

The objective of this program is to obtain engine performance data for estimating fuel economy and emissions for varied engine service and duty. The intent of work done at the Bartlesville Energy Technology Center is to provide basic engine characteristic data required as input for engineering calculations of fuel consumption and emissions involving ground transportation.

The data acquired from tests of a 1978 Ford 140-CID engine are presented in this report. Ford uses the 140-CID engine as equipped in a Pinto which is in the 2,750 lb inertia weight class. The engine as equipped is intended for use in a California vehicle with automatic transmission. The test results are sufficient to establish steady-state maps for fuel consumption and emissions (carbon monoxide, unburned hydrocarbon, and oxides of nitrogen) over the entire operating range of the engine.

2. ENGINE TEST REPORT

The engine test setup included a complete engine (SAE definition) coupled to an eddy-current dynamometer. A cooling tower was used in the place of the fan and radiator. The alternator was included but was not wired into the engine's electrical system.

The emission control system consists of a dual catalytic converter (the upstream half of the catalyst is a 3-way catalyst, and the other half is a conventional oxidation catalyst) with feedback control monitoring the exhaust oxygen concentration and controlling the fuel flow to produce a stoichiometric exhaust mixture. The control loop consists of a zirconium dioxide sensor to measure oxygen concentration, an electronic control unit, a vacuum regulator to proportion a vacuum signal to the carburetor, and a carburetor with vacuum modulated main fuel system. The system also includes exhaust gas recirculation and an air-injection system that injects secondary air into the exhaust manifold when the coolant temperature is below 125° F and into the catalyst assembly just ahead of the conventional oxidation catalyst when the coolant temperature is above 125° F. The manufacturer's specifications for the 1978 Ford 140-CID engine are given in Table 1.

Prior to testing, engine break-in consisted of 40 hours of operation at various speeds/load modes representative of normal engine operation. Table 2 contains details of the break-in schedule. A single batch of unleaded regular grade gasoline was used throughout the break-in and tests; a detailed fuel analysis is given in table 3. Engine testing began on November 7, 1978, and ended on December 27, 1978.

During steady-state tests the engine was operated at the following speed/load modes:

Speeds: 1,000; 1,600; 2,200; 2,800; 3,300; 3,900; 4,400;
4,800 rpm

Loads: 0, 10, 25, 40, 60, 75, 90, 100 pct of full load
(0, 10, 25, 60, and 75 pct points were repeated
for all engine speeds)

Idle speed/load modes: 850 rpm -- 0, 10, 15 lb-ft
750 rpm -- 6 lb-ft

Over-speed mode: 5,000 rpm -- 86 lb-ft (wide-open-throttle)

Total number of test modes.....	68
Total number of repeats.....	45
Total number of tests.....	<u>113</u>

The following data were recorded for each test point:

Test number
Data source code (1 = before catalyst, 2 = after catalyst)
Date

Barometric pressure, mm Hg
 Wet bulb temperature, °F
 Dry bulb temperature, °F
 Inlet air temperature, °F
 Speed, rpm
 Torque, lb-ft -- Daytronic strain gauge load cell
 Fuel rate, lb/hr -- Fluidyne positive displacement fuel flow meter
 Ignition timing, °BTC
 Manifold vacuum, in. Hg
 Intake manifold pressure, in. Hg
 CO, pct -- Beckman NDIR
 CO₂, pct -- Beckman NDIR
 O₂, pct -- Beckman polarographic detector
 HC, ppmC -- Custom-built heated flame ionization detector
 NO_x, ppm -- Thermo-Electron chemiluminescent detector
 Oil temperature, °F
 Coolant temperature, °F
 Exhaust temperature, °F
 Exhaust pressure, in H₂O
 Intake manifold temperature, °F

The following equations were used in calculating power, air-fuel (A/F) ratio, absolute humidity, and mass emission rates of carbon monoxide (CO), unburned hydrocarbons (HC), and oxides of nitrogen (NO_x):

1. Partial pressure of water vapor in intake air (millimeters of mercury):

$$P = \exp \left[18.717 - \frac{7308.1}{393 + D} \right]$$

where D = Dew point, °F

2. Absolute humidity (grains moisture per pound dry air):

$$H = \frac{4347.8(P)}{B - P}$$

where B = Barometric pressure, mm Hg

3. Humidity correction factor (dimensionless):

$$K_H = \frac{1}{1 - 0.0047(H - 75)}$$

Note: This factor is used to correct the NO_x mass emission rate to a standard humidity of 75 grains moisture per pound dry air.

4. Hydrogen concentration in raw exhaust (percent):

$$H_2 = \frac{x(CO)(CO + CO_2)}{2(CO + 3CO_2)}$$

where CO = Carbon monoxide concentration (percent)
 CO₂ = Carbon dioxide concentration (percent)
 x = Fuel hydrogen/carbon atomic ratio

Note: This equation assumes a water-gas shift equilibrium constant:

$$\frac{(CO)(H_2O)}{(CO_2)(H_2)} = 3$$

5. Correction factor for emission concentrations from wet basis to dry basis (dimensionless):

$$C_w = 1 + \frac{(x/2)(CO + CO_2) - H_2}{100}$$

Note: In these tests only HC is measured on a wet basis.
 All other species are measured on a dry basis.

6. Air-fuel ratio (dimensionless):

$$AF = \frac{68.9994}{MW_{fuel}} \left[\frac{(1 + \frac{x}{2} - y)(CO) + (2 + \frac{x}{2} - y)(CO_2) + 2(O_2) + \frac{NO_x}{10^4} - H_2}{CO + CO_2 + C_w(HC/10^4)} \right]$$

where O₂ = Oxygen concentration (percent)
 NO_x = Oxides of nitrogen (ppm)
 HC = Unburned hydrocarbon concentration (ppmC)
 y = Fuel oxygen/carbon atomic ratio
 MW_{fuel} = Fuel molecular weight per carbon atom
 = 12.01115 + 1.00797x + 15.9994y

7. Carbon monoxide mass emission rate (grams per hour):

$$M_{CO} = \left(\frac{MW_{CO}}{MW_{fuel}} \right) \left[\frac{(\%CO)(M_f)}{\%CO + \%CO_2 + C_w(\%HC)} \right] (453.59237)$$

MW_{CO} = Molecular weight of CO (28.10155)
 M_f = Fuel rate in lb/hour
 %HC = HC(ppmC)/10⁴

8. Unburned hydrocarbon mass emission rate (grams per hour):

$$M_{HC} = \left(\frac{MW_{HC}}{MW_{fuel}} \right) \left[\frac{(\%HC)(M_f)(C_w)}{\%CO + \%CO_2 + C_w(\%HC)} \right] (453.59237)$$

MW_{HC} = Molecular weight of hydrocarbon per carbon atom
 $= 12.01115 + 1.00797x + 15.9994y$

9. Oxides of nitrogen mass emission rate (grams per hour):

$$M_{NO_x} = \left(\frac{MW_{NO_x}}{MW_{fuel}} \right) \left[\frac{(\%NO_x)(M_f)}{\%CO + \%CO_2 + C_w(\%HC)} \right] (453.59237) K_H$$

MW_{NO_x} = Molecular weight of NO_2 = 46.0055

$\%NO_x$ = $NO_x(\text{ppm})/10^4$

10. Power (brake horsepower corrected to a standard barometric pressure of 736.6 mm Hg and a standard temperature of 85° F):

$$HP = \left(\frac{(N)(T)}{5252.113} \right) \left(\frac{736.6}{B - P} \right) \sqrt{\frac{t + 460}{545}}$$

where N = Engine speed (revolutions per minute)

T = Brake torque (ft-lb)

t = Air temperature (°F)

3. DISCUSSION OF TEST RESULTS

Maximum corrected brake horsepower, maximum torque, and brake specific fuel consumption (bsfc) are plotted as functions of engine speed at wide-open-throttle (WOT) in figure 1. The maximum brake horsepower and the maximum torque produced by the engine were slightly lower than the values quoted in Table 1 (9 percent and 7 percent, respectively) but were produced at the specified speeds. Minimum bsfc occurred at 3,300 rpm, indicating a high efficiency mode at this speed.

The fuel rates were found to be nearly a linear function of power for most engine speeds except for the WOT load modes at some speeds where fuel-rich operation caused a significant increase in fuel rates (figure 2). Fuel rates were repeated for all speeds duplicated. The A/F ratio measured before the catalyst reflects the actual stoichiometry in the combustion chamber and remained between 14 and 16 for all modes except at WOT where the A/F ration significantly decreased (Figure 3). The A/F ratio measured after the catalyst was significantly higher, due to the injection of secondary air into the catalyst to support the oxidation process of the conventional oxidation catalyst.

Both the before-catalyst and after-catalyst exhaust emissions of CO, HC, and NO_x are plotted as functions of power for all engine speeds (figures 4 thru 6). These figures indicate the engine emission levels and the effectiveness of the dual catalytic converter. The injection of secondary air into the catalyst assembly provided sufficient oxygen to support the oxidation process of the conventional oxidation catalyst. This effectively reduces the emissions of CO and HC at all modes except those modes at WOT.

4. CONCLUSIONS

The experimental work to obtain performance data for the Ford 140-CID engine has been completed; these data are presented in the tables accompanying this report.

TABLE 1. MANUFACTURER'S ENGINE SPECIFICATIONS

Displacement, cubic inches.....	140
Maximum horsepower, bhp @ 4,800 rpm.....	88
Maximum torque, lb-ft @ 2,800 rpm.....	118
Bore and stroke, inches.....	3.781 x 3.126
Configuration.....	Inline, 4-cylinder camshaft
Compression ratio.....	9 to 1
Firing order.....	1-3-4-2
Ignition timing at idle speed, BTCD @ 600 rpm.....	17°
Block material.....	Cast iron
Head material.....	Cast iron
Number of crankshaft main bearing.....	5
Number of compression rings/piston.....	2
Number of oil rings/piston.....	1
Cam drive type.....	Belt
Valve timing:	
Intake opens, °BTC.....	22
Intake closes, °ABC.....	66
Exhaust opens, °BBC.....	64
Exhaust closes, °ATC.....	24
Spark plug gap, inches.....	.034
Weight of engine, pounds.....	375
Crankcase emission control:	
Control method.....	Positive crankcase ventilation
Point of discharge.....	Carburetor spacer
Carburetor type.....	2-V, downdraft
Distributor specifications:	
Centrifugal advance, begins, ° @ 1,600 rpm.....	1
Centrifugal advance, intermediate, ° @ 3,000 rpm.....	5
Centrifugal advance, full, ° @ 5,000 rpm.....	13
Vacuum advance, begins, ° @ 2.3 in. Hg.....	0
Vacuum advance, maximum, ° @ 15.75 in. Hg.....	24
Carburetor number.....	D8EE-EA
Distributor number.....	D7EE-CA
Exhaust-gas-recirculation:	
Valve number.....	87EE-9D475-G2A
Valve type.....	Internal tapered stem
Point of exhaust injection.....	Carburetor spacer
Air injection system:	
Air pump type.....	Vane, constant displacement
Point of injection.....	Exhaust manifold and mixing chamber in dual catalytic converter

TABLE 2. ENGINE BREAK-IN SCHEDULE

Simulated vehicle speed, mph	Engine speed, rpm	Intake manifold vacuum, in. Hg	Fraction of time in mode
Idle	850	18.8	1/10
20	1,000	16.4	"
30	1,350	16	"
40	1,800	11.5	"
50	2,200	12	"
60	2,650	11	"
25	1,100	16.5	"
35	1,550	15.5	"
45	2,000	12.5	"
55	2,400	12	"

Mileage per cycle = 90 miles.

Total mileage accumulated over 40 hour break-in period = 1,440 miles.

TABLE 3. FUEL ANALYSIS

Fuel No.....	7718
Research octane No.....	91.8
Motor octane No.....	84.0
Specific gravity.....	0.717
API gravity, degrees.....	65.9
Distillation, °F:	
10 pct evaporated.....	123
50 pct ".....	209
95 pct ".....	402
100 pct ".....	413
Reid vapor pressure, psi.....	11.26
FIA analysis, pct:	
Aromatics.....	9
Olefins.....	15
Paraffins.....	76
Sulfur, pct.....	0.016
Lead, grams per gallon.....	Trace
Hydrogen/carbon atomic ratio.....	2.038

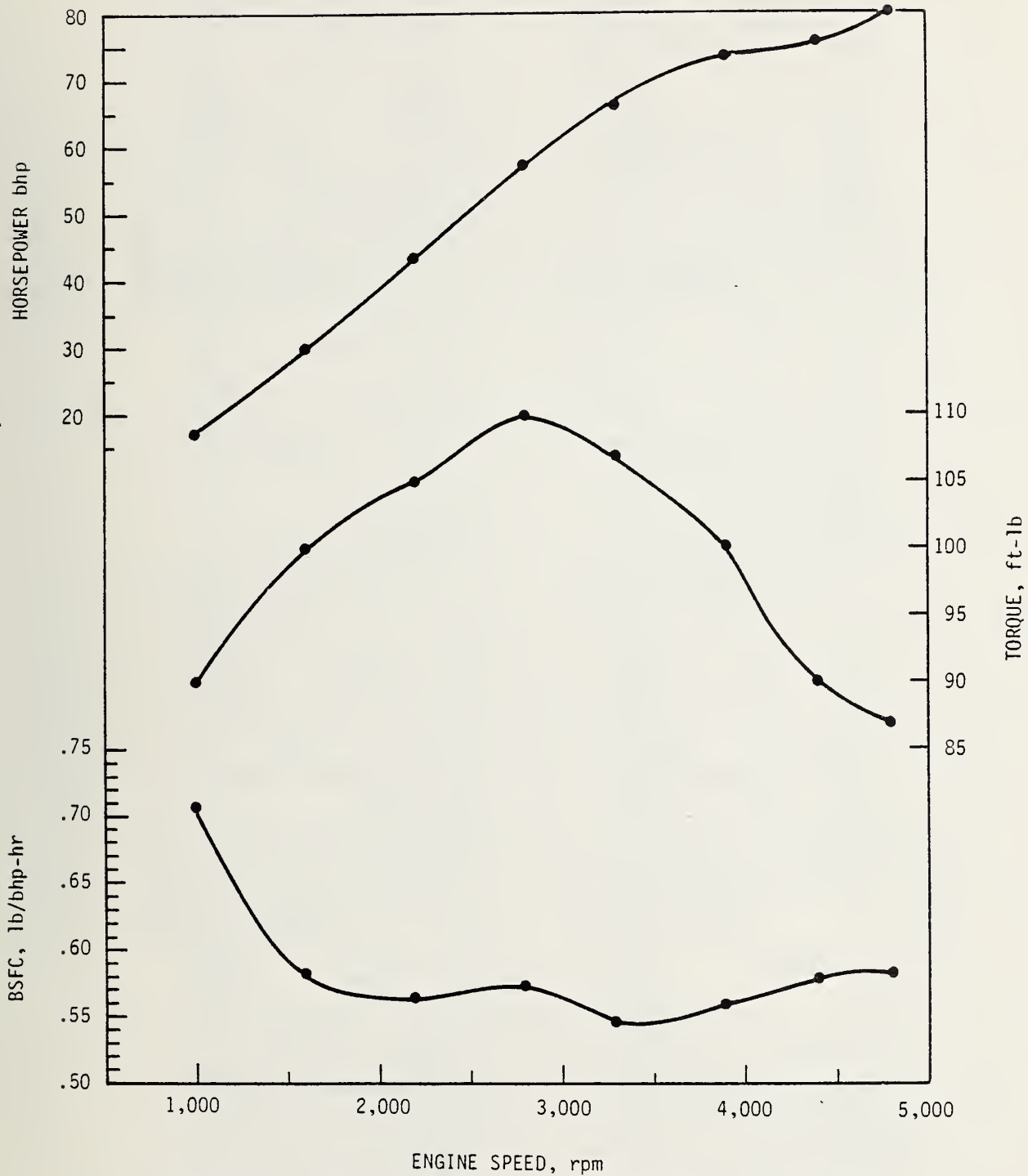


FIGURE 1. Brake Specific Fuel Consumption, Torque and Brake Horsepower Versus Engine rpm at Wide-Open-Throttle--Ford 140 CID Engine.

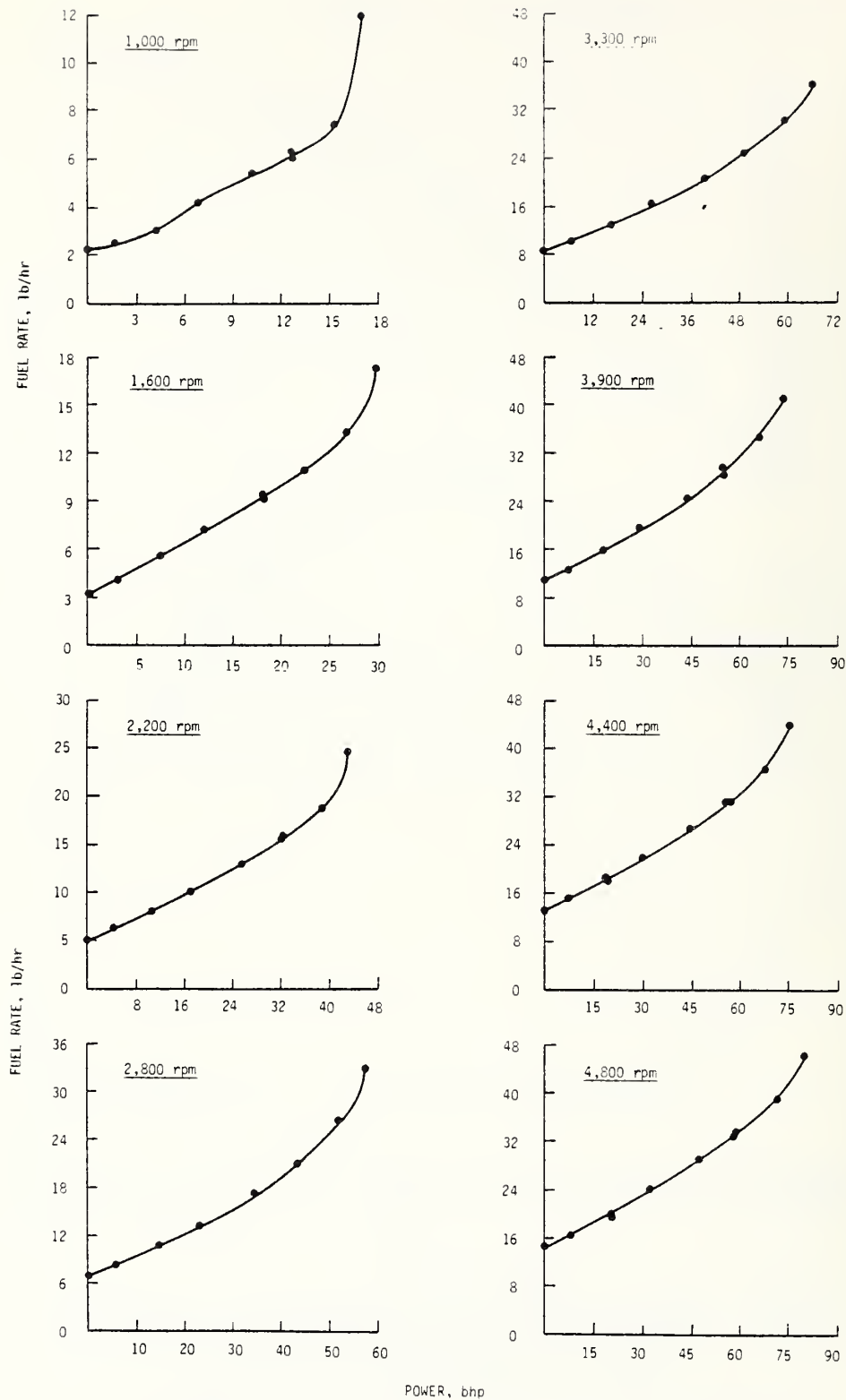


FIGURE 2. Fuel Rate Versus Power at Various Speed and Load Conditions--Ford 140-CID Engine.

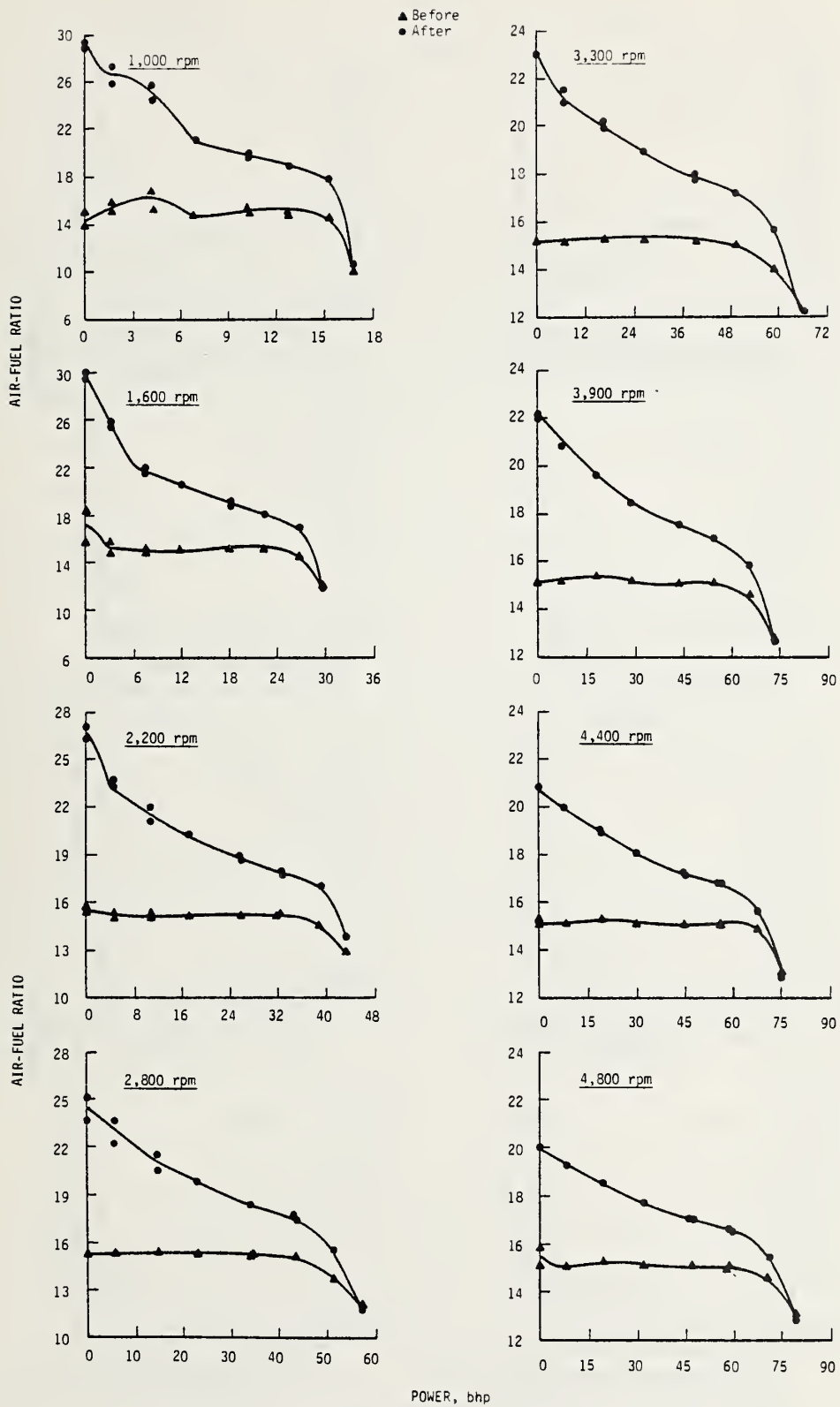


FIGURE 3. Air-Fuel Ratio Versus Power at Various Speed and Load Conditions-- Ford 140-CID Engine.

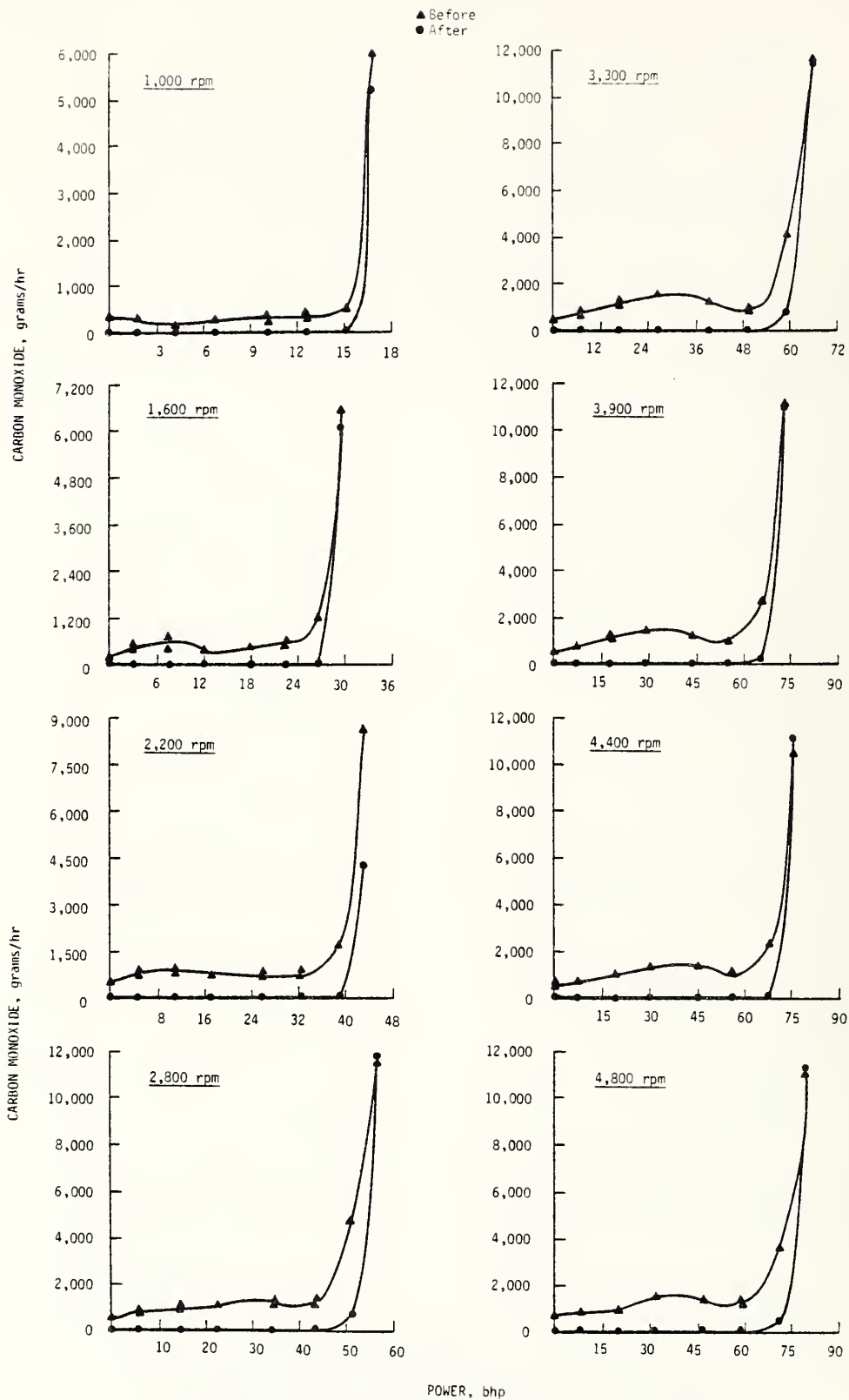


FIGURE 4. Carbon Monoxide Emissions Versus Power at Various Speed and Load Conditions--Ford 140-CID Engine.

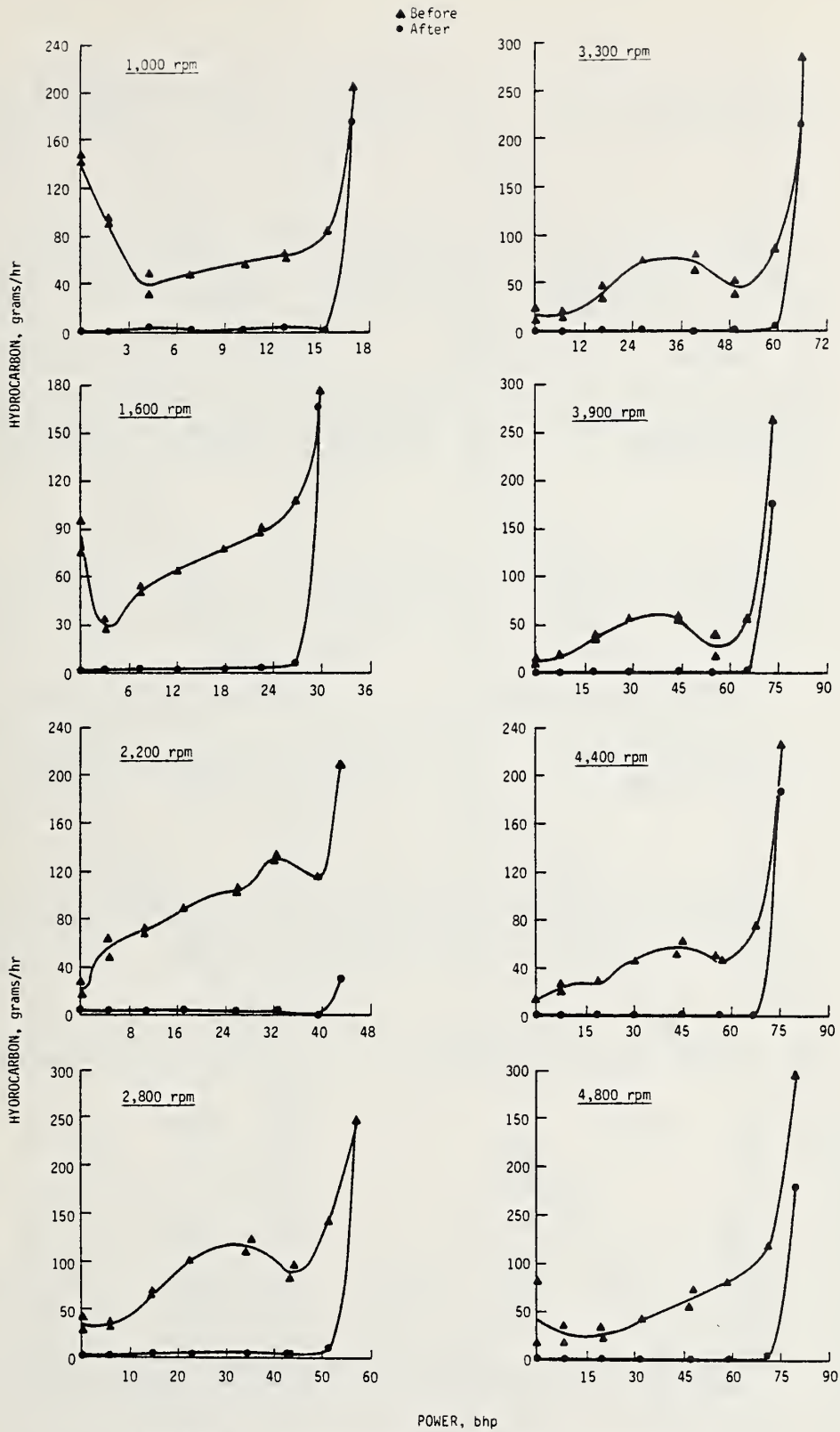


FIGURE 5. Hydrocarbon Emissions Versus Power At Various Speed and Load Conditions--Ford 140-CID Engine.

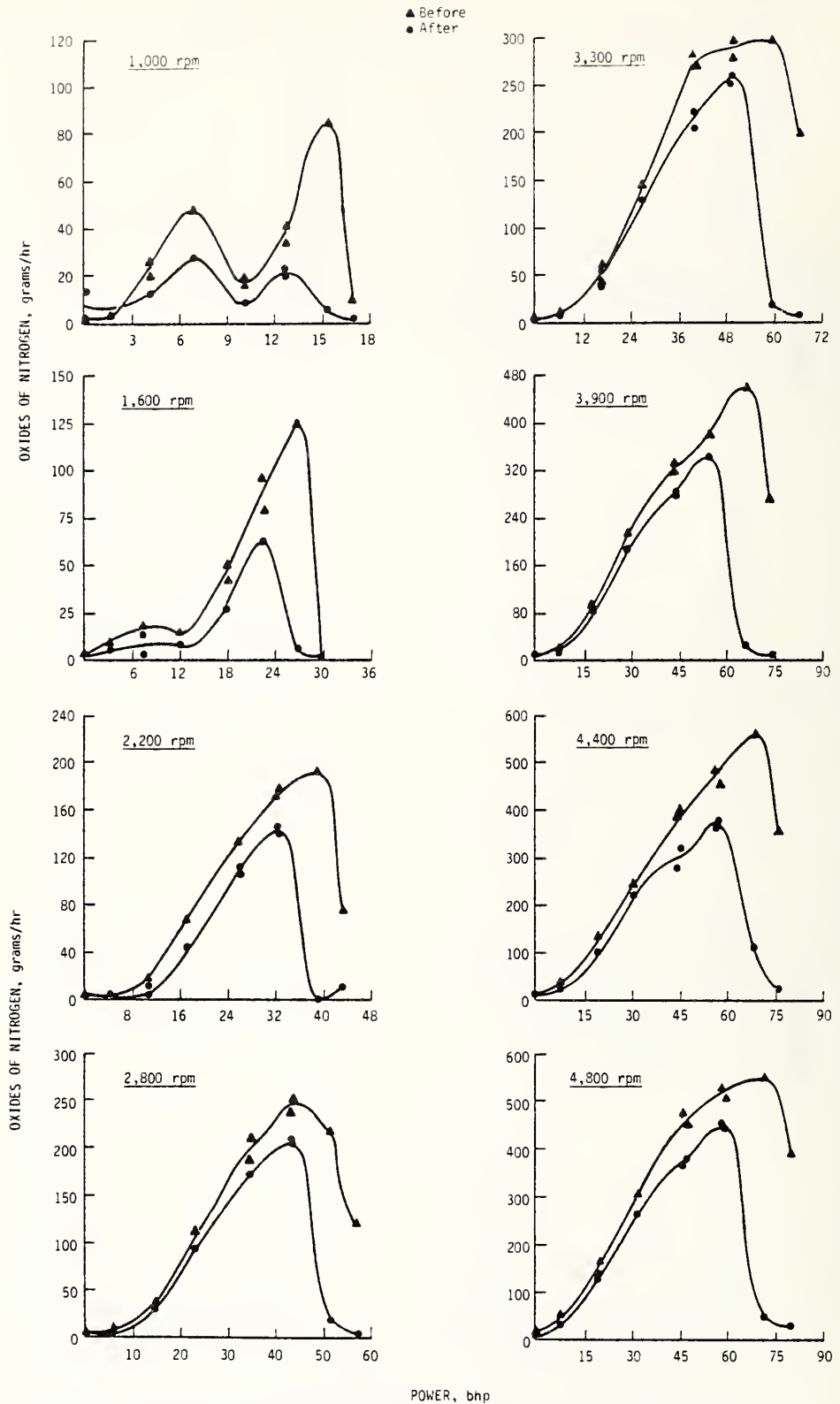


FIGURE 6. Oxides of Nitrogen Emissions Versus Power at Various Speed and Load Conditions--Ford 140-CID Engine.

ENGINE: 1978 FORD 140-CID CALIF. 3-WAY CATALYST

FUEL CODE: 7718	1.01	1.02	2.01	2.02	3.01	3.02
TEST NUMBER	1	2	1	2	1	2
DATA SOURCE CODE						
TEST DATE	11/ 7/78	11/ 7/78	11/ 7/78	11/ 7/78	11/ 7/78	11/ 7/78
BAROMETER, MMHG	751.5	751.5	750.5	750.5	750.0	750.0
HUMIDITY, GRAINS/LB	49	49	49	49	49	49
TEMPERATURE, F	76	76	76	76	76	76
ENGINE SPEED, RPM	850	850	850	850	850	850
TOPOUE, FT-LB	.0	.0	10.0	10.0	15.0	15.0
POWER, BHP*	.0	.0	1.6	1.6	2.4	2.4
FUEL RATE, LB/HR	2.0	2.0	2.4	2.3	2.7	2.6
IGNITION TIMING, DEG BTDC	37.0	37.0	37.0	37.0	37.0	37.0
MANIFOLD VACUUM, IN HG	20.0	20.0	19.0	19.0	18.0	18.0
INTAKE MAN. TEMP., F	126	127	117	117	114	113
CONCENTRATIONS, DRY BASIS						
CO, %	4.0520	.0043	2.4787	.0020	2.7330	.0042
CO2, %	10.17	7.95	12.39	8.60	12.37	8.90
O2, %	3.33	9.77	1.61	8.87	.91	8.24
HC, PPMC	11546	84	9196	142	5048	202
NOX, PPM	28	1	98	10	172	21
AIR/FUEL RATIO	13.99	26.84	13.89	24.88	13.72	23.84
EMISSION RATES, G/HR						
CO	484.4	1.0	335.9	.5	419.1	1.1
HC	69.3	1.0	62.6	1.7	38.9	2.7
NOX+	.5	.0	1.9	.4	3.9	.8
OIL TEMPERATURE, F	183	182	182	185	188	187
OIL PRESSURE, PSI	48	50	50	50	47	47
COOLANT TEMPERATURE, F	177	178	182	179	180	179
EXHAUST PRESSURE, IN. H2O	2.0	1.0	2.0	1.0	2.0	1.0
EXHAUST TEMPERATURE, F	414	600	480	540	506	524

* CORRECTED SAE J816B
 + CORRECTED FOR HUMIDITY

ENGINE: 1979 FORD 140-CID CALIF. 3-WAY CATALYST

	4.01	4.02	5.01	5.02	6.01	6.02
FUEL CODE: 7718						
TEST NUMBER	1	2	1	2	1	2
DATA SOURCE CODE						
TEST DATE	12/27/78	12/27/78	11/ 8/78	12/ 8/78	11/13/78	11/13/78
BAROMETER, MMHG	753.0	753.0	743.0	743.0	743.0	743.0
HUMIDITY, GRAINS/LB	33	33	48	48	72	72
TEMPERATURE, F	76	76	80	80	81	81
ENGINE SPEED, RPM	750	750	1000	1000	1000	1000
TORQUE, FT-LB	6.0	6.0	90.0	90.0	81.0	81.0
POWER, BHP*	.8	.8	17.0	17.0	15.4	15.4
FUEL RATE, LB/HR	2.1	2.1	12.0	11.4	7.5	7.4
IGNITION TIMING, DEG BTDC	38.0	38.0	16.0	16.0	17.0	17.0
MANIFOLD VACUUM, IN HG	19.8	19.8	.1	.1	2.8	2.8
INTAKE MAN. TEMP., F	127	128	84	84	88	88
CONCENTRATIONS, DRY BASIS						
CO, %	3.8545	.0106	10.5002	9.1069	1.1652	.0032
CO2, %	9.60	8.18	7.89	8.55	13.14	11.97
O2, %	3.83	9.29	.26	.02	.92	3.59
HC, PPMC	17578	143	7168	6258	3638	91
NOX, PPM	36	20	119	16	1121	57
AIR:FUEL RATIO	13.81	25.89	10.22	10.61	14.57	17.74
EMISSION RATES, G/HR						
CO	470.1	2.4	5956.2	5123.1	536.6	1.8
HC	107.7	1.6	204.2	176.8	84.1	2.6
NOX+	.6	.6	9.8	1.3	83.9	5.2
OIL TEMPERATURE, F	184	184	210	210	202	202
OIL PPESSURE, PSI	43	43	47	47	48	48
COOLANT TEMPERATURE, F	183	184	182	182	183	182
EXHAUST PPESSURE, IN. H2O	3.0	1.0	15.0	5.0	12.0	5.0
EXHAUST TEMPERATURE, F	411	359	958	829	896	746

* CORRECTED SAE J816B
 + CORRECTED FOR HUMIDITY

ENGINE: 1978 FORD 140-CID CALIF. 3-WAY CATALYST

	7.01	7.02	8.01	8.02	9.01	9.02
FUEL CODE: 7718						
TEST NUMBER	1	2	1	2	1	2
DATA SOURCE CODE						
TEST DATE	11/13/78	11/13/78	11/13/78	11/13/78	11/13/78	11/13/78
BAROMETER, MMHG	742.5	742.5	742.5	742.5	742.5	742.0
HUMIDITY, GRAINS/LB	72	71	71	71	74	74
TEMPERATURE, F	81	81	81	80	79	79
ENGINE SPEED, RPM	1000	1000	1000	1000	1000	1000
TORQUE, FT-LB	67.5	67.5	54.0	54.0	36.0	36.0
POWER, BHP*	12.8	12.8	10.3	10.3	6.8	6.9
FUEL RATE, LB/HR	6.1	6.1	5.4	5.3	4.2	4.2
IGNITION TIMING, DEG BTDC	21.0	21.0	27.0	27.0	37.0	37.0
MANIFOLD VACUUM, IN HG	4.7	4.5	6.6	6.7	13.2	13.2
INTAKE MAN. TEMP., F	109	111	132	133	98	99
CONCENTRATIONS, DRY BASIS						
CO, %	7937	.0054	7314	.0048	.9762	.0038
CO2, %	13.32	11.26	13.33	10.67	13.16	9.80
O2, %	1.10	4.65	1.14	5.38	1.19	6.54
HC, PPMC	3277	94	3380	92	3567	110
NOX, PPM	644	252	301	120	1098	431
AIR/FUEL RATIO	14.88	18.86	14.92	19.74	14.84	21.35
EMISSION RATES, G/HR						
CO	304.8	2.7	245.8	2.2	256.0	1.5
HC	63.2	2.3	57.0	2.1	47.0	2.1
NOX+	40.2	20.0	16.3	8.7	47.1	27.0
OIL TEMPERATURE, F	200	200	200	199	192	195
OIL PRESSURE, PSI	49	49	49	50	51	51
COOLANT TEMPERATURE, F	183	184	184	184	183	185
EXHHAUST PRESSURE, IN. H2O	11.0	4.0	8.0	3.0	5.0	2.0
EXHHAUST TEMPERATURE, F	859	636	807	566	665	490

* CORRECTED SAE J816B
 + CORRECTED FOR HUMIDITY

ENGINE: 1978 FORD 140-CID CALIF. 3-WAY CATALYST

	10.01	10.02	11.01	11.02	12.01	12.02
FUEL CODE: 7718						
TEST NUMBER	1	2	1	2	1	2
DATA SOURCE CODE						
TEST DATE	11/13/78	11/13/78	11/13/78	11/13/78	11/13/78	11/13/78
BAROMETER, MMHG	741.5	741.5	742.0	741.5	742.0	741.5
HUMIDITY, GRAINS/LB	74	74	74	74	74	74
TEMPERATURE, F	78	78	79	78	78	77
ENGINE SPEED, RPM	1000	1000	1000	1000	1000	1000
TORQUE, FT-LB	22.5	22.5	9.0	9.0	9.0	9.0
POWER, BHP*	4.3	4.3	1.7	1.7	1.7	1.7
FUEL RATE, LB/HR	3.1	3.1	2.5	2.5	2.2	2.2
IGNITION TIMING, DEG BTDC	37.0	37.0	37.0	37.0	37.0	37.0
MANIFOLD VACUUM, IN HG	16.5	16.4	18.5	18.2	20.2	20.2
INTAKE MAN. TEMP., F	107	107	113	113	118	119
CONCENTRATIONS, DRY BASIS						
CO, %	4321	4059	13647	10047	25003	20044
CO2, %	13.09	8.46	11.14	8.01	10.55	7.20
O2, %	1.61	8.60	3.34	9.16	3.55	10.26
HC, PPMC	4722	305	11489	120	21344	91
NOX, PPM	587	237	139	60	59	20
AIR/FUEL RATIO	15.26	24.70	15.30	25.98	13.91	28.75
EMISSION RATES, G/HR						
CO	87.6	1.9	222.7	1.3	333.5	1.2
HC	48.0	5.0	94.1	1.7	143.0	1.3
NOX+	19.5	12.7	3.7	2.8	1.3	.9
OIL TEMPERATURE, F	195	195	193	193	190	189
OIL PRESSURE, PSI	51	51	51	51	52	53
COOLANT TEMPERATURE, F	185	185	185	184	181	181
EXHAUST PRESSURE, IN. H2O	4.0	2.0	4.0	2.0	4.0	1.0
EXHAUST TEMPERATURE, F	595	389	500	491	433	467

* CORRECTED SAE J816B
 + CORRECTED FOR HUMIDITY

ENGINE: 1978 FORD 140-CID CALIF. 3-WAY CATALYST

FUEL CODE: 7718

TEST NUMBER

DATA SOURCE CODE

TEST DATE

BAROMETER, MMHG

HUMIDITY, GRAINS/LB

TEMPERATURE, F

ENGINE SPEED, RPM

TORQUE, FT-LB

POWER, BHP*

FUEL RATE, LB/HR

IGNITION TIMING, DEG BTDC

MANIFOLD VACUUM, IN HG

INTAKE MAN. TEMP., F

CONCENTRATIONS, DRY BASIS

CO, %

CO2, %

O2, %

HC, PPMC

NOX, PPM

AIR/FUEL RATIO

EMISSION RATES, G/HR

CO

HC

NOX+

OIL TEMPERATURE, F

OIL PRESSURE, PSI

COOLANT TEMPERATURE, F

EXHAUST PRESSURE, IN. H2O

EXHAUST TEMPERATURE, F

* CORRECTED SAE J816B

+ CORRECTED FOR HUMIDITY

13.01	13.02	14.01	14.02	15.01	15.02
1	2	1	2	1	2
11/14/78	11/14/78	11/14/78	11/14/78	11/14/78	11/14/78
751.0	751.0	751.5	751.5	751.5	751.5
44	44	44	44	44	44
82	82	80	82	80	81
1600	1600	1600	1600	1600	1600
100.0	100.0	90.0	90.0	75.0	75.0
29.9	29.9	26.9	26.9	22.4	22.4
17.4	17.3	13.5	13.4	10.8	10.9
14.0	14.0	13.0	13.0	20.0	20.0
.2	.2	3.0	3.0	5.4	5.4
73	73	82	82	102	103
7.3660	6.8340	1.4895	.0008	.7175	.0000
10.26	10.36	13.31	12.86	13.63	11.96
.16	.00	.79	2.79	1.06	4.04
4001	3705	2650	141	2559	65
5	15	1070	48	990	540
11.62	11.71	14.44	16.92	14.97	18.14
6434.0	6085.7	1201.3	.8	481.4	.0
175.5	165.7	107.4	6.7	86.2	2.7
.7	2.0	123.8	6.6	95.3	63.8
216	216	211	213	210	211
54	54	55	55	55	55
186	186	186	185	186	186
27.0	9.0	30.0	12.0	20.0	8.0
1155	751	1202	890	1090	714

ENGINE: 1978 FORD 140-CID CALIF. 3-WAY CATALYST

	16.01	16.02	17.01	17.02	18.01	18.02
FUEL CODE:	7718					
TEST NUMBER	1	2	1	2	1	2
DATA SOURCE CODE						
TEST DATE	11/14/78	11/14/78	11/14/78	11/14/78	11/14/78	11/14/78
BAROMETER, MMHG	751.5	751.5	751.5	751.5	751.0	751.0
HUMIDITY, GRAINS/LB	44	44	44	44	44	44
TEMPERATURE, F	79	79	79	79	78	78
ENGINE SPEED, RPM	1600	1600	1600	1600	1600	1600
TORQUE, FT-LB	60.0	60.0	40.0	40.0	25.0	25.0
POWER, BHP*	17.9	17.9	12.0	12.0	7.5	7.5
FUEL RATE, LB/HR	9.2	9.4	7.2	7.2	5.6	5.7
IGNITION TIMING, DEG BTDC	27.0	27.0	34.0	34.0	36.0	36.0
MANIFOLD VACUUM, IN HG	8.0	8.0	11.7	11.2	16.2	16.2
INTAKE MAN. TEMP., F	121	123	150	151	124	124
CONCENTRATIONS, DRY BASIS						
CO, %	7643	.0025	.8856	.0000	1.2388	.0000
CO2, %	13.47	11.37	13.28	10.39	12.97	9.58
O2, %	1.13	4.91	1.26	6.08	1.33	7.14
HC, PPMC	2632	55	2821	65	2816	57
NOX, PPM	607	256	225	88	240	45
AIR/FUEL RATIO	14.98	19.04	14.98	20.55	14.86	22.11
EMISSION RATES, G/HR						
CO	439.9	1.8	395.9	.0	434.2	.0
HC	76.1	2.1	63.3	2.0	49.6	1.5
NOX+	50.2	27.3	14.4	7.9	12.1	3.5
OIL TEMPERATURE, F	206	209	208	207	205	205
OIL PRESSURE, PSI	55	55	55	55	56	56
COOLANT TEMPERATURE, F	186	187	187	187	186	187
EXHAUST PRESSURE, IN. H2O	15.0	6.0	12.0	4.0	9.0	3.0
EXHAUST TEMPERATURE, F	1040	664	945	571	858	509

* CORRECTED SAE J816B
 + CORRECTED FOR HUMIDITY

ENGINE: 1978 FORD 140-CID CALIF. 3-WAY CATALYST

FUEL CODE: 7718

	19.01	19.02	20.01	20.02	21.01	21.02
TEST NUMBER	1	2	1	2	1	2
DATA SOURCE CODE						
TEST DATE	11/14/78	11/14/78	11/14/78	11/14/78	11/27/78	11/27/78
BAROMETER, MMHG	751.5	751.5	751.0	751.0	746.5	746.5
HUMIDITY, GRAINS/LB	41	41	43	43	36	36
TEMPERATURE, F	77	77	77	76	83	82
ENGINE SPEED, RPM	1600	1600	1600	1600	2200	2200
TORQUE, FT-LB	10.0	10.0	.0	.0	105.0	105.0
POWER, BHP*	3.0	3.0	.0	.0	43.4	43.4
FUEL RATE, LB/HR	4.1	4.1	3.5	3.3	24.5	24.5
IGNITION TIMING, DEG BTDC	36.0	36.0	36.0	36.0	18.0	18.0
MANIFOLD VACUUM, IN HG	20.6	20.6	22.0	21.3	.5	.5
INTAKE MAN. TEMP., F	106	103	104	103	76	76
CONCENTRATIONS, DRY BASIS						
CO, %	1.6517	.0010	.4671	.0003	6.6754	3.0771
CO2, %	12.47	8.06	12.22	7.03	10.30	12.88
O2, %	1.57	9.20	2.74	10.62	.71	.42
HC, PPMC	2591	91	7895	72	3241	414
NOX, PPM	257	81	125	55	428	55
AIR/FUEL RATIO	14.85	25.98	15.71	29.60	12.18	13.72
EMISSION RATES, G/HR						
CO	420.3	.5	111.0	.1	8556.4	4257.0
HC	33.1	2.1	94.2	1.5	208.7	28.8
NOX+	9.3	5.2	4.3	3.3	76.2	10.6
OIL TEMPERATURE, F	203	202	201	200	229	224
OIL PRESSURE, PSI	56	56	57	56	56	56
COOLANT TEMPERATURE, F	185	186	185	184	187	185
EXHAUST PRESSURE, IN. H2O	6.0	2.0	5.0	2.0	55.0	55.0
EXHAUST TEMPERATURE, F	760	401	721	343	1260	1360

* CORRECTED SAE J816B
+ CORRECTED FOR HUMIDITY

ENGINE: 1978 FORD 140-CID CALIF. 3-WAY CATALYST

FUEL CODE: 7718	22.01	22.02	23.01	23.02	24.01	24.02
TEST NUMBER	1	2	1	2	1	2
DATA SOURCE CODE						
TEST DATE	12/27/78	11/27/78	11/28/78	11/28/78	11/28/78	11/28/78
BAROMETER, MMHG	746.5	747.0	750.5	750.0	750.0	750.5
HUMIDITY, GRAINS/LB	44	44	39	39	39	39
TEMPERATURE, F	84	83	79	80	80	80
ENGINE SPEED, RPM	2200	2200	2200	2200	2200	2200
TORQUE, FT-LB	95.0	95.0	79.0	79.0	63.0	63.0
POWER, BHP*	39.3	39.3	32.4	32.4	25.9	25.8
FUEL RATE, LB/HR	18.8	18.7	15.4	15.4	12.8	12.8
IGNITION TIMING, DEG BTDC	19.0	19.0	25.0	25.0	32.0	32.0
MANIFOLD VACUUM, IN HG	2.7	2.7	5.6	5.6	8.7	8.7
INTAKE MAN. TEMP., F	82	83	97	99	112	113
CONCENTRATIONS, DRY BASIS						
CO, %	1.4666	.0089	.7599	.0089	.8471	.0089
CO2, %	13.63	13.16	13.33	11.88	13.25	11.36
O2, %	.79	2.91	1.19	3.91	1.17	4.67
HC, PPMC	2023	0	2620	43	2475	56
NOX, PPM	1206	5	1258	899	1177	784
AIR/FUEL RATIO	14.52	16.97	15.05	18.07	15.00	18.86
EMISSION RATES, G/HR						
CO	1624.2	11.4	738.5	10.4	683.0	9.1
HC	112.5	.0	127.9	2.5	100.2	2.9
NOX+	192.1	.9	171.9	147.5	133.5	112.1
OIL TEMPERATURE, F	227	228	219	220	220	220
OIL PRESSURE, PSI	56	56	57	57	57	57
COOLANT TEMPERATURE, F	186	187	186	187	185	186
EXHAUST PRESSURE, IN. H2O	54.0	54.0	39.0	16.0	31.0	12.0
EXHAUST TEMPERATURE, F	1328	1110	1229	996	1137	863

* CORRECTED SAE J816B
 + CORRECTED FOR HUMIDITY

ENGINE. 1978 FORD 140-CID CALIF. 3-WAY CATALYST

FUEL CODE: 7718

TEST NUMBER

DATA SOURCE CODE

TEST DATE

BAROMETER, MMHG

HUMIDITY, GRAINS/LB

TEMPERATURE, F

ENGINE SPEED, RPM

TORQUE, FT-LB

POWER, BHP*

FUEL RATE, LB/HR

IGNITION TIMING, DEG BTDC

MANIFOLD VACUUM, IN HG

INTAKE MAN. TEMP., F

CONCENTRATIONS, DRY BASIS

CO, %

CO2, %

O2, %

HC, PPMC

NOX, PPM

AIR/FUEL RATIO

EMISSION RATES, G/HR

CO

HC

NOX+

OIL TEMPERATURE, F

OIL PRESSURE, PSI

COOLANT TEMPERATURE, F

EXHAUST PRESSURE, IN. H2O

EXHAUST TEMPERATURE, F

* CORRECTED SAE J8168

+ CORRECTED FOR HUMIDITY

	25.01	25.02	26.01	26.02	27.01	27.02
	1	2	1	2	1	2
	11/28/78	11/28/78	11/28/78	11/28/78	11/28/78	11/28/78
	750.5	750.5	750.5	750.0	750.5	750.5
	39	39	39	39	39	39
	79	79	77	77	78	78
	2200	2200	2200	2200	2200	2200
	42.0	42.0	26.0	26.0	11.0	11.0
	17.2	17.2	10.7	10.7	4.5	4.5
	9.9	10.0	7.9	8.0	6.4	6.4
	38.0	38.0	39.0	39.0	39.0	39.0
	12.5	12.5	15.4	15.4	17.8	17.8
	132	133	154	53	164	162
	1.0748	.0076	1.5149	.0075	1.7686	.0082
	12.97	10.54	12.62	9.75	12.38	8.95
	1.46	5.86	1.61	7.02	1.78	8.17
	2801	58	2719	52	3074	54
	745	357	223	56	75	23
	15.05	20.27	14.93	21.85	14.89	23.73
	672.3	6.5	754.1	5.6	709.1	5.2
	88.0	2.5	68.0	1.9	61.9	1.7
	65.6	42.8	15.6	5.8	4.2	2.1
	217	217	215	214	210	210
	57	57	58	58	58	58
	188	188	189	188	187	186
	21.0	8.0	16.0	6.0	12.0	4.0
	1022	637	967	616	936	540

ENGINE: 1978 FORD 140-CID CALIF. 3-WAY CATALYST

	28.01	28.02	29.01	29.02	30.01	30.02
FUEL CODE: 7718						
TEST NUMBER	1	2	1	2	1	2
DATA SOURCE CODE						
TEST DATE	11/28/78	11/28/78	11/28/78	11/ 8/78	11/28/78	11/28/78
BAROMETER, MMHG	750.5	750.0	749.5	749.5	749.5	749.0
HUMIDITY, GRAINS/LB	39	39	41	41	41	41
TEMPERATURE, F	77	77	83	85	86	88
ENGINE SPEED, RPM	2200	2200	2800	2800	2800	2800
TORQUE: FT-LB	.0	.0	110.0	110.0	99.0	99.0
POWER, BHP*	.0	.0	57.5	57.5	51.7	51.8
FUEL RATE, LB/HR	4.8	4.8	32.9	32.9	26.7	26.6
IGNITION TIMING, DEG BTDC	39.0	39.0	18.0	18.0	19.0	19.0
MANIFOLD VACUUM, IN HG	22.1	22.1	.8	.8	2.2	2.2
INTAKE MAN. TEMP., F	105	102	73	75	78	80
CONCENTRATIONS, DRY BASIS						
CO, %	1.4208	.0088	6.6220	6.7258	3.0103	.3956
CO2, %	12.62	7.84	10.19	10.13	12.22	13.44
O2, %	1.91	9.82	.61	.09	.64	1.26
HC, PPMC	1922	80	2832	2841	1803	95
NOX, PPM	167	65	489	19	975	73
AIR/FUEL RATIO	15.27	27.05	12.16	11.81	13.75	15.51
EMISSION RATES, G/HR						
CO	431.7	4.8	11510.5	11650.0	4715.8	686.8
HC	29.3	2.2	247.2	247.1	141.8	8.3
NOX+	7.2	5.0	120.4	4.7	216.4	18.0
OIL TEMPERATURE, F	209	209	227	239	237	240
OIL PRESSURE, PSI	59	59	59	59	58	58
COOLANT TEMPERATURE, F	185	186	188	187	187	186
EXHAUST PRESSURE, IN. H2O	10.0	4.0	76.0	32.0	91.0	40.0
EXHAUST TEMPERATURE, F	864	422	1325	1026	1403	1299

* CORRECTED SAE J816B
 + CORRECTED FOR HUMIDITY

ENGINE: 1978 FORD 140-CID CALIF. 3-WAY CATALYST

	31.01	31.02	32.01	32.02	33.01	33.02
FUEL CODE: 7718						
TEST NUMBER	1	2	1	2	1	2
DATA SOURCE CODE						
TEST DATE	11/28/78	11/28/78	11/28/78	11/28/78	11/28/78	11/28/78
BAROMETER, MMHG	749.0	749.0	748.5	748.5	747.0	746.5
HUMIDITY, GRAINS/LB	41	41	41	41	41	41
TEMPERATURE, F	87	87	86	86	82	82
ENGINE SPEED, RPM	2800	2800	2800	2800	2800	2800
TORQUE, FT-LB	83.0	83.0	66.0	66.0	44.0	44.0
POWER, BHP*	43.4	43.4	34.5	34.5	23.1	23.1
FUEL RATE, LB/HR	21.2	21.2	17.4	17.4	13.3	13.4
IGNITION TIMING, DEG BTDC	24.0	24.0	32.0	32.0	38.0	38.0
MANIFOLD VACUUM, IN HG	4.4	4.4	7.7	7.7	12.0	12.0
INTAKE MAN. TEMP., F	97	98	116	116	122	122
CONCENTRATIONS, DRY BASIS						
CO, %	.7611	.0094	.9680	.0092	1.1158	.0084
CO2, %	13.35	12.12	12.93	11.66	12.67	10.64
O2, %	.87	3.38	1.29	4.16	1.59	5.49
HC, PPMC	1219	25	1966	38	2326	52
NOX, PPM	1251	934	1179	900	906	582
AIR/FUEL RATIO	14.97	17.58	15.09	18.34	15.18	19.89
EMISSION RATES, G/HR						
CO	1023.8	14.8	1079.7	12.3	959.8	9.6
HC	82.3	2.0	110.1	2.6	100.5	3.0
NOX+	238.4	208.6	186.4	171.8	110.5	93.7
OIL TEMPERATURE, F	239	239	238	237	231	231
OIL PRESSURE, PSI	58	58	58	58	59	59
COOLANT TEMPERATURE, F	188	187	187	187	189	188
EXHAUST PRESSURE, IN. H2O	67.0	28.0	46.0	20.0	30.0	13.0
EXHAUST TEMPERATURE, F	1416	1041	1255	950	1157	872

* CORRECTED SAE J816B
 + CORRECTED FOR HUMIDITY

ENGINE: 1978 FORD 140-CID CALIF. 3-WAY CATALYST

	34.01	34.02	35.01	35.02	36.01	36.02
FUEL CODE: 7718						
TEST NUMBER	1	2	1	2	1	2
DATA SOURCE CODE						
TEST DATE	11/28/78	11/28/78	11/28/78	11/28/78	11/28/78	11/28/78
BAROMETER, MMHG	746.5	746.5	746.5	746.5	746.0	746.5
HUMIDITY, GRAINS/LB	41	41	41	41	41	41
TEMPERATURE, F	82	81	81	81	81	81
ENGINE SPEED, RPM	2800	2800	2800	2800	2800	2800
TORQUE, FT-LB	28.0	28.0	11.0	11.0	.0	.0
POWER, BHP*	14.7	14.7	5.8	5.8	.0	.0
FUEL RATE, LB/HR	10.6	10.6	8.2	8.2	7.1	7.1
IGNITION TIMING, DEG BTDC	40.0	40.0	40.0	40.0	40.0	40.0
MANIFOLD VACUUM, IN HG	15.0	15.0	17.7	17.7	19.0	19.0
INTAKE MAN. TEMP., F	140	139	162	162	175	175
CONCENTRATIONS, DRY BASIS						
CO, %	1.3185	.0081	1.4154	.0078	1.1056	.0076
CO2, %	12.37	9.76	12.55	8.97	12.66	8.46
O2, %	1.71	6.75	1.57	8.03	1.51	8.92
HC, PPMC	1877	60	1190	49	1782	44
NOX, PPM	388	210	95	47	58	31
AIR/FUEL RATIO	15.20	21.58	15.11	23.57	15.16	25.14
EMISSION RATES, G/HR						
CO	908.8	8.0	742.2	6.5	509.4	5.7
HC	65.0	3.0	31.3	2.0	41.2	1.6
NOX+	38.0	29.1	7.1	5.5	3.8	3.3
OIL TEMPERATURE, F	228	227	224	223	222	221
OIL PRESSURE, PSI	60	60	60	60	61	61
COOLANT TEMPERATURE, F	188	187	187	187	188	188
EXHAUST PRESSURE, IN. H2O	22.0	9.0	17.0	6.0	14.0	5.0
EXHAUST TEMPERATURE, F	1103	817	1112	737	1166	686

* CORRECTED SAE J816B
+ CORRECTED FOR HUMIDITY

ENGINE: 1978 FORD 140-CID CALIF. 3-WAY CATALYST

	37.01	37.02	38.01	38.02	39.01	39.02
FUEL CODE: 7718	1	2	1	2	1	2
DATA SOURCE CODE						
TEST DATE	11/28/78	11/28/78	11/28/78	11/28/78	11/28/78	11/28/78
BAROMETER, MMHG	745.0	745.0	744.5	744.5	744.5	744.5
HUMIDITY, GRAINS/LB	41	41	41	41	41	41
TEMPERATURE, F	88	90	94	94	93	93
ENGINE SPEED, RPM	3300	3300	3300	3300	3300	3300
TORQUE, FT-LB	107.0	107.0	96.0	96.0	80.0	80.0
POWER, BHP*	66.3	66.3	59.5	59.5	49.6	49.6
FUEL RATE, LB/HR	36.2	36.3	30.4	30.2	24.6	24.5
IGNITION TIMING, DEG BTDC	19.0	19.0	19.0	19.0	25.0	25.0
MANIFOLD VACUUM, IN HG	1.0	1.0	2.1	2.1	4.5	4.5
INTAKE MAN. TEMP., F	78	80	86	87	103	103
CONCENTRATIONS, DRY BASIS						
CO, %	5.8471	5.7647	2.1825	.3439	.4782	.0083
CO2, %	10.58	10.83	12.74	13.24	13.61	12.22
O2, %	.24	.09	.39	1.33	.58	2.98
HC, PPMC	2878	2205	940	66	493	14
NOX, PPM	721	23	1153	60	1264	989
AIR/FUEL RATIO	12.24	12.25	14.03	15.60	14.98	17.24
EMISSION RATES, G/HR						
CO	11431.7	11238.4	3985.4	690.8	751.8	15.1
HC	282.6	215.9	86.2	6.6	39.0	1.3
NOX+	199.9	6.5	298.9	17.1	281.9	254.5
OIL TEMPERATURE, F	249	255	252	252	250	250
OIL PRESSURE, PSI	58	58	58	58	59	59
COOLANT TEMPERATURE, F	189	189	187	187	189	188
EXHAUST PRESSURE, IN. H2O	98.0	43.0	114.0	52.0	86.0	38.0
EXHAUST TEMPERATURE, F	1415	1193	1545	1400	1526	1195

* CORRECTED SAE J816B
 + CORRECTED FOR HUMIDITY

ENGINE: 1978 FORD 140-CID CALIF. 3-WAY CATALYST

	40.01	40.02	41.01	41.02	42.01	42.02
FUEL CODE: 7718						
TEST NUMBER	1	2	1	2	1	2
DATA SOURCE CODE						
TEST DATE	11/29/78	11/29/78	11/29/78	11/29/78	11/29/78	11/29/78
BAROMETER, MMHG	743.5	743.5	742.5	742.5	743.0	742.5
HUMIDITY, GRAINS/LB	44	44	48	40	40	40
TEMPERATURE, F	87	88	84	84	85	85
ENGINE SPEED, RPM	3300	3300	3300	3300	3300	3300
TORQUE, FT-LB	64.0	64.0	43.0	43.0	27.0	27.0
POWER, BHP*	39.8	39.8	26.8	26.8	16.8	16.8
FUEL RATE, LB/HR	20.5	20.7	16.6	16.6	12.9	12.9
IGNITION TIMING, DEG BTDC	34.0	34.0	41.0	41.0	43.0	43.0
MANIFOLD VACUUM, IN HG	7.7	7.7	11.7	11.7	15.1	15.1
INTAKE MAN. TEMP., F	116	116	117	120	135	136
CONCENTRATIONS, DRY BASIS						
CO, %	.9106	.0093	1.4195	.0088	1.2261	.0086
CO2, %	13.58	12.02	12.64	11.32	12.74	10.44
O2, %	1.12	3.85	1.71	4.69	1.61	5.79
HC, PPMC	994	19	1379	30	831	26
NOX, PPM	1312	921	927	690	372	248
AIR/FUEL RATIO	15.10	17.98	15.21	18.89	15.28	20.25
EMISSION RATES, G/HR						
CO	1153.2	14.4	1500.3	11.6	1020.5	9.7
HC	63.2	1.5	73.2	2.0	34.8	1.4
NOX+	238.3	204.8	143.1	128.9	43.6	39.2
OIL TEMPERATURE, F	245	245	234	239	237	237
OIL PRESSURE, PSI	59	59	61	61	61	61
COOLANT TEMPERATURE, F	188	188	189	190	189	189
EXHAUST PRESSURE, IN. H2O	63.0	28.0	44.0	19.0	28.0	13.0
EXHAUST TEMPERATURE, F	1373	1000	1270	928	1266	870

* CORRECTED SAE J8168
+ CORRECTED FOR HUMIDITY

ENGINE: 1978 FORD 140-CID CALIF. 3-WAY CATALYST

FUEL CODE: 7718

TEST NUMBER

DATA SOURCE CODE

TEST DATE

BAROMETER, MMHG

HUMIDITY, GRAINS/LB

TEMPERATURE, F

ENGINE SPEED, RPM

TORQUE, FT-LB

POWER, BHP*

FUEL RATE, LB/HR

IGNITION TIMING, DEG BTDC

MANIFOLD VACUUM, IN HG

INTAKE MAN. TEMP., F

CONCENTRATIONS, DRY BASIS

CO, %

CO2, %

O2, %

HC, PPMC

NOX, PPM

AIR/FUEL RATIO

EMISSION RATES, G/HR

CO

HC

NOX+

OIL TEMPERATURE, F

OIL PRESSURE, PSI

COOLANT TEMPERATURE, F

EXHAUST PRESSURE, IN. H2O

EXHAUST TEMPERATURE, F

* CORRECTED SAE J816B

+ CORRECTED FOR HUMIDITY

43.01	43.02	44.01	44.02	45.01	45.02
1	2	1	2	1	2
11/29/78	11/29/78	11/29/78	11/29/78	11/29/78	11/29/78
742.5	743.0	743.0	743.0	743.5	743.0
46	46	46	46	42	42
84	84	84	84	91	92
3300	3300	3300	3300	3900	3900
11.0	11.0	.0	.0	100.0	100.0
6.9	6.9	.0	.0	73.5	73.6
10.0	10.1	8.8	8.8	41.2	40.9
43.0	43.0	44.0	44.0	22.0	22.0
18.0	18.0	19.2	19.2	1.2	1.2
158	158	170	170	79	79
.9318	.0075	.7563	.0079	4.9205	4.9424
13.13	9.72	13.46	9.17	11.43	11.53
1.18	6.91	1.11	7.68	.22	.08
469	11	329	15	2330	1592
97	43	64	32	835	26
15.15	21.77	15.19	23.02	12.68	12.64
595.4	7.0	422.2	6.8	11044.3	10982.9
15.1	.5	9.2	.6	262.7	177.6
9.0	5.8	5.2	4.0	267.1	8.4
232	232	230	230	251	253
62	62	62	62	60	60
189	187	188	187	189	189
20.0	8.0	15.0	7.0	128.0	59.0
1337	803	1353	760	1463	1200

ENGINE: 1978 FORD 140-CID CALIF. 3-WAY CATALYST

FUEL CODE: 7718	46.01	46.02	47.01	47.02	48.01	48.02
TEST NUMBER	1	2	1	2	1	2
DATA SOURCE CODE						
TEST DATE	11/29/78	11/29/78	11/29/78	11/29/78	11/29/78	11/29/78
BAROMETER, MMHG	743.5	743.5	743.5	743.5	743.5	743.5
HUMIDITY, GRAINS/LB	42	42	42	42	42	42
TEMPERATURE, F	90	94	96	97	95	95
ENGINE SPEED, RPM	3900	3900	3900	3900	3900	3900
TORQUE, FT-LB	90.0	90.0	75.0	75.0	60.0	60.0
POWER, BHP*	66.2	66.2	55.1	55.1	44.1	44.1
FUEL RATE, LB/HR	34.6	34.6	28.2	28.1	24.1	24.1
IGNITION TIMING, DEG BTDC	22.0	22.0	27.0	27.0	36.0	36.0
MANIFOLD VACUUM, IN HG	2.1	2.1	4.8	4.8	7.7	7.7
INTAKE MAN. TEMP., F	82	86	109	109	122	121
CONCENTRATIONS, DRY BASIS						
CO, %	1.2610	.0876	.4753	.0084	.8114	.0089
CO2, %	13.56	13.62	13.96	12.82	13.49	12.26
O2, %	.48	1.41	.59	2.69	.93	3.27
HC, PPMC	529	26	441	11	732	14
NOX, PPM	1539	63	1523	1225	1474	1129
AIR/FUEL RATIO	14.56	15.78	15.00	16.91	15.05	17.47
EMISSION RATES, G/HR						
CO	2647.5	199.8	836.6	16.6	1229.0	15.7
HC	55.8	2.9	39.0	1.1	55.7	1.3
NOX+	460.3	20.5	381.9	345.7	318.1	285.2
OIL TEMPERATURE, F	250	260	261	261	258	258
OIL PRESSURE, PSI	60	60	59	59	60	60
COOLANT TEMPERATURE, F	189	189	189	189	189	189
EXHAUST PRESSURE, IN. H2O	142.0	66.0	104.0	48.0	80.0	36.0
EXHAUST TEMPERATURE, F	1595	1331	1544	1180	1427	1108

* CORRECTED SAE J816B
 + CORRECTED FOR HUMIDITY

ENGINE: 1978 FORD 140-CID CALIF. 3-WAY CATALYST

	49.01	49.02	50.01	50.02	51.01	51.02
FUEL CODE: 7718	1	2	1	2	1	2
DATA SOURCE CODE						
TEST DATE	11/30/78	11/30/78	11/30/78	11/30/78	11/30/78	11/30/78
BAROMETER, MMHG	746.5	746.5	746.5	746.5	746.5	746.5
HUMIDITY, GRAINS/LB	45	45	45	45	45	45
TEMPERATURE, F	80	80	80	80	81	81
ENGINE SPEED, RPM	3900	3900	3900	3900	3900	3900
TORQUE, FT-LB	40.0	40.0	25.0	25.0	10.0	10.0
POWER, BHP*	29.3	29.3	18.3	18.3	7.3	7.3
FUEL RATE, LB/HR	19.6	19.6	16.0	15.9	12.6	12.5
IGNITION TIMING, DEG BTDC	42.0	42.0	44.0	44.0	45.0	45.0
MANIFOLD VACUUM, IN HG	11.7	11.7	14.7	14.7	17.5	17.5
INTAKE MAN. TEMP., F	114	115	125	125	143	143
CONCENTRATIONS, DRY BASIS						
CO, %	1.1236	.0074	1.1495	.0072	.9050	.0078
CO2, %	13.25	11.82	13.18	11.06	13.59	10.37
O2, %	1.26	4.34	1.48	5.34	1.09	6.36
HC, PPM	926	30	764	27	486	16
NOX, PPM	1192	857	628	418	147	72
AIR/FUEL RATIO	15.10	18.44	15.23	19.55	15.09	20.82
EMISSION RATES, G/HR						
CO	1375.6	11.1	1151.8	9.3	705.6	8.5
HC	56.9	2.2	38.4	1.7	19.0	.9
NOX+	210.6	185.2	90.8	78.0	16.5	11.4
OIL TEMPERATURE, F	248	250	246	245	242	241
OIL PRESSURE, PSI	61	61	61	61	62	62
COOLANT TEMPERATURE, F	189	190	189	189	190	189
EXHAUST PRESSURE, IN. H2O	55.0	25.0	41.0	18.0	27.0	12.0
EXHAUST TEMPERATURE, F	1314	1055	1295	915	1364	785

* CORRECTED SAE J816B
 + CORRECTED FOR HUMIDITY

ENGINE: 1978 FORD 140-CID CALIF. 3-WAY CATALYST

FUEL CODE: 7718	52.01	52.02	53.01	53.02	54.01	54.02
TEST NUMBER	1	2	1	2	1	2
DATA SOURCE CODE						
TEST DATE	11/30/78	11/30/78	12/ 5/78	12/ 5/78	12/ 5/78	12/ 5/78
BAROMETER, MMHG	746.5	746.0	731.5	731.0	731.0	731.5
HUMIDITY, GRAINS/LB	45	45	36	37	37	36
TEMPERATURE, F	81	81	87	89	91	91
ENGINE SPEED, RPM	3900	3900	4400	4400	4400	4400
TORQUE, FT-LB	.0	.0	90.0	90.0	81.0	81.0
POWER, BHP*	.0	.0	75.7	75.8	68.2	68.2
FUEL RATE, LB/HR	10.8	10.9	43.8	43.8	36.6	36.7
IGNITION TIMING, DEG BTDC	46.0	46.0	26.0	26.0	26.0	26.0
MANIFOLD VACUUM, IN HG	19.0	19.0	1.3	1.3	2.0	2.0
INTAKE MAN. TEMP., F	157	157	77	79	85	85
CONCENTRATIONS, DRY BASIS						
CO, %	.7207	.0061	4.3068	4.7250	.9659	.0221
CO2, %	13.74	9.76	11.85	11.92	13.71	14.19
O2, %	1.00	7.18	.52	.12	.80	1.16
HC, PPMC	513	14	1856	1587	665	14
NOX, PPM	86	41	1063	66	1803	342
AIR/FUEL RATIO	15.11	22.02	13.16	12.79	14.90	15.61
EMISSION RATES, G/HR						
CO	484.8	6.1	10424.4	11122.1	2167.6	51.6
HC	17.3	.7	225.6	187.6	75.0	1.6
NOX+	8.3	5.9	358.5	21.8	563.8	111.0
OIL TEMPERATURE, F	239	238	259	272	267	267
OIL PRESSURE, PSI	63	63	59	59	58	58
COOLANT TEMPERATURE, F	188	188	188	189	188	188
EXHAUST PRESSURE, IN. H2O	22.0	10.0	147.0	68.0	156.0	72.0
EXHAUST TEMPERATURE, F	1376	753	1481	1271	1592	1396

* CORRECTED SAE J816B
+ CORRECTED FOR HUMIDITY

ENGINE: 1978 FORD 140-CID CALIF. 3-WAY CATALYST

FUEL CODE: 7718

TEST NUMBER

DATA SOURCE CODE

TEST DATE

BAROMETER, MMHG

HUMIDITY, GRAINS/LB

TEMPERATURE, F

ENGINE SPEED, RPM

TORQUE, FT-LB

POWER, BHP*

FUEL RATE, LB/HR

IGNITION TIMING, DEG BTDC

MANIFOLD VACUUM, IN HG

INTAKE MAN. TEMP., F

CONCENTRATIONS, DRY BASIS

CO, %

CO2, %

O2, %

HC, PPMC

NOX, PPM

AIR/FUEL RATIO

EMISSION RATES, G/HR

CO

HC

NOX+

OIL TEMPERATURE, F

OIL PRESSURE, PSI

COOLANT TEMPERATURE, F

EXHAUST PRESSURE, IN. H2O

EXHAUST TEMPERATURE, F

* CORRECTED SAE J816B
+ CORRECTED FOR HUMIDITY

55.01	55.02	56.01	56.02	57.01	57.02
1	2	1	2	1	2
12/ 5/78	12/ 5/78	12/ 5/78	12/ 5/78	12/ 5/78	12/ 5/78
731.5	731.5	731.5	731.5	731.5	731.5
36	36	36	36	36	36
91	91	93	93	89	89
4400	4400	4400	4400	4400	4400
68.0	68.0	54.0	54.0	36.0	36.0
57.2	57.2	45.4	45.4	30.3	30.3
31.4	31.4	26.9	26.9	21.7	21.8
30.0	30.0	38.0	38.0	44.0	44.0
4.6	4.6	7.3	7.3	11.1	11.1
104	104	122	122	124	124
.4848	.0096	.7468	.0109	.9410	.0098
14.24	13.02	13.65	12.65	13.46	11.94
.69	2.54	.86	2.94	1.06	3.89
461	12	726	15	665	16
1712	1260	1705	1195	1309	958
15.06	16.76	15.04	17.13	15.08	18.04
931.8	20.8	1255.4	21.0	1276.4	16.2
44.4	1.3	61.3	1.5	45.3	1.3
458.5	382.5	399.4	319.8	247.5	219.6
261	261	270	270	259	259
59	59	58	58	60	60
190	190	190	190	190	190
124.0	57.0	97.0	44.0	69.0	31.0
1547	1222	1474	1170	1421	11080

ENGINE: 1978 FORD 140-CID CALIF. 3-WAY CATALYST

	58.01	58.02	59.01	59.02	60.01	60.02
FUEL CODE: 7718						
TEST NUMBER	1	2	1	2	1	2
DATA SOURCE CODE						
TEST DATE	12/ 5/78	12/ 5/78	12/ 5/78	12/ 5/78	12/ 5/78	12/ 5/78
BAROMETER, MMHG	731.5	731.0	731.0	731.5	731.5	731.5
HUMIDITY, GRAINS/LB	36	37	37	36	36	36
TEMPERATURE, F	90	90	90	90	90	90
ENGINE SPEED, RPM	4400	4400	4400	4400	4400	4400
TORQUE, FT-LB	23.0	23.0	9.0	9.0	.0	.0
POWER, BHP*	19.4	19.4	7.6	7.6	.0	.0
FUEL RATE, LB/HR	18.0	18.4	14.8	14.8	12.8	12.8
IGNITION TIMING, DEG BTDC	48.0	48.0	49.0	49.0	48.0	48.0
MANIFOLD VACUUM, IN HG	13.9	13.9	16.8	16.8	18.2	18.2
INTAKE MAN. TEMP., F	134	134	147	147	159	159
CONCENTRATIONS, DRY BASIS						
CO, %	.7776	.0110	.7494	.0100	.5293	.0108
CO2, %	13.39	11.31	13.43	10.58	13.30	10.04
O2, %	1.16	4.66	.85	5.50	.92	6.19
HC, PPMC	495	12	432	7	338	7
NOX, PPM	819	602	241	144	115	60
AIR/FUEL RATIO	15.23	18.87	15.01	19.91	15.18	20.85
EMISSION RATES, G/HR						
CO	888.6	16.1	704.1	12.6	442.9	12.5
HC	28.4	.9	20.4	.4	14.2	.4
NOX+	130.4	123.0	31.5	25.4	13.5	9.6
OIL TEMPERATURE, F	260	260	255	255	253	253
OIL PRESSURE, PSI	60	60	61	61	61	61
COOLANT TEMPERATURE, F	191	191	189	189	188	188
EXHAUST PRESSURE, IN. H2O	52.0	23.0	38.0	16.0	31.0	13.0
EXHAUST TEMPERATURE, F	1414	1030	1459	970	1451	"912

* CORRECTED SAE J816B
+ CORRECTED FOR HUMIDITY

ENGINE: 1978 FORD 140-CID CALIF. 3-WAY CATALYST

FUEL CODE: 7718

	61.01	61.02	62.01	62.02	63.01	63.02
TEST NUMBER	1	2	1	2	1	2
DATA SOURCE CODE						
TEST DATE	12/ 5/78	12/ 5/78	12/ 5/78	12/ 5/78	12/ 5/78	12/ 5/78
BAROMETER, MMHG	731.0	731.5	731.5	731.5	731.5	731.5
HUMIDITY, GRAINS/LB	37	36	36	36	36	36
TEMPERATURE, F	91	94	95	95	96	96
ENGINE SPEED, RPM	4800	4800	4800	4800	4800	4800
TORQUE, FT-LB	87.0	87.0	78.0	78.0	65.0	65.0
POWER, BHP*	79.9	79.9	71.6	71.6	59.7	59.7
FUEL RATE, LB/HR	46.5	46.4	39.6	39.6	34.0	34.0
IGNITION TIMING, DEG BTDC	27.0	27.0	28.0	28.0	30.0	30.0
MANIFOLD VACUUM, IN HG	1.5	1.5	2.0	2.0	4.3	4.3
INTAKE MAN. TEMP., F	80	81	85	85	111	111
CONCENTRATIONS, DRY BASIS						
CO, %	4.2113	4.3932	1.4612	1.594	.5109	.0104
CO2, %	11.69	11.78	13.02	13.69	13.48	12.74
O2, %	.39	.11	.68	.91	.68	2.24
HC, PPMC	2252	1402	925	35	260	9
NOX, PPM	1092	71	1626	130	1681	1337
AIR/FUEL RATIO	13.07	12.89	14.56	15.38	15.08	16.58

EMISSION RATES, G/HR

CO	10974.3	11284.0	3586.3	411.0	1118.3	25.1
HC	294.7	180.8	114.0	4.6	28.5	1.1
NOX+	396.7	25.5	556.1	46.7	512.7	448.8

OIL TEMPERATURE, F	266	271	275	275	279	279
OIL PRESSURE, PSI	57	57	54	54	53	53
COOLANT TEMPERATURE, F	190	189	190	190	190	190
EXHAUST PRESSURE, IN. H2O	165.0	77.0	174.0	82.0	143.0	67.0
EXHAUST TEMPERATURE, F	1523	1280	1602	1430	1600	1280

* CORRECTED SAE J816B
+ CORRECTED FOR HUMIDITY

ENGINE: 1978 FORD 140-CID CALIF. 3-WAY CATALYST

	64.01	64.02	65.01	65.02	66.01	66.02
FUEL CODE: 7718						
TEST NUMBER	1	2	1	2	1	2
DATA SOURCE CODE						
TEST DATE	12/ 5/78	12/ 5/78	12/ 5/78	12/ 5/78	12/ 5/78	12/ 5/78
BAROMETER, MMHG	731.5	731.5	732.5	732.5	732.5	732.5
HUMIDITY, GRAINS/LB	39	39	38	36	36	36
TEMPERATURE, F	94	94	88	88	91	91
ENGINE SPEED, RPM	4800	4800	4800	4800	4800	4800
TORQUE, FT-LB	52.0	52.0	35.0	35.0	22.0	22.0
POWER, BHP*	47.8	47.8	32.1	32.1	20.2	20.2
FUEL RATE, LB/HR	29.4	29.4	24.2	24.2	19.8	19.7
IGNITION TIMING, DEG BTDC	40.0	40.0	46.0	46.0	49.0	49.0
MANIFOLD VACUUM, IN HG	7.1	7.1	10.8	10.8	13.9	13.9
INTAKE MAN. TEMP., F	21	121	121	121	136	136
CONCENTRATIONS, DRY BASIS						
CO, %	.7012	.0091	.9093	.0104	.6944	.0091
CO2, %	13.32	12.34	13.15	11.91	13.36	11.43
O2, %	.83	2.66	1.02	3.46	1.05	4.27
HC, PPMC	723	12	527	10	338	7
NOX, PPM	1726	1273	1420	1040	929	657
AIR/FUEL RATIO	15.04	16.97	15.09	17.70	15.21	18.49
EMISSION RATES, G/HR						
CO	1320.3	19.6	1407.5	19.1	881.4	14.1
HC	68.3	1.3	40.9	.9	21.6	.6
NOX+	457.4	385.1	308.3	265.9	164.3	142.7
OIL TEMPERATURE, F	275	275	255	255	268	268
OIL PRESSURE, PSI	54	54	57	57	55	55
COOLANT TEMPERATURE, F	191	191	191	191	191	191
EXHAUST PRESSURE, IN. H2O	111.0	51.0	82.0	37.0	60.0	26.0
EXHAUST TEMPERATURE, F	501	1203	1450	1109	1462	11063

* CORRECTED SAE J8168
 + CORRECTED FOR HUMIDITY

ENGINE: 1978 FORD 140-CID CALIF. 3-WAY CATALYST

	67.01	67.02	68.01	68.02	69.01	69.02
FUEL CODE: 7718	1	2	1	2	1	2
DATA SOURCE CODE						
TEST DATE	12/ 5/78	12/ 5/78	12/ 5/78	12/ 5/78	11/30/78	11/30/78
BAROMETER, MMHG	732.5	732.5	732.5	733.0	745.5	745.5
HUMIDITY, GRAINS/LB	36	36	36	36	43	43
TEMPERATURE, F	91	91	91	91	76	76
ENGINE SPEED, RPM	4800	4800	4800	4800	850	850
TORQUE, FT-LB	9.0	9.0	.0	.0	.0	.0
POWER, BHP*	8.2	8.2	.0	.0	.0	.0
FUEL RATE, LB/HR	16.3	16.3	14.3	14.3	2.0	2.0
IGNITION TIMING, DEG BTDC	50.0	50.0	50.0	50.0	37.0	37.0
MANIFOLD VACUUM, IN HG	16.5	16.5	17.9	17.9	20.3	20.3
INTAKE MAN. TEMP., F	146	146	154	154	118	119
CONCENTRATIONS, DRY BASIS						
CO, %	.6861	.0093	.6697	.0091	2.3812	.0068
CO2, %	13.56	10.93	13.40	10.43	8.46	7.08
O2, %	.82	5.03	.88	5.56	6.43	10.52
HC, PPMC	339	5	311	5	22572	71
NOX, PPM	327	164	140	69	51	36
AIR/FUEL RATIO	15.04	19.32	15.08	20.04	15.83	29.34
EMISSION RATES, G/HR						
CO	706.2	12.5	611.3	11.2	331.2	1.8
HC	17.5	.4	14.3	.3	157.7	.9
NOX+	46.8	30.7	17.8	11.8	1.0	1.3
OIL TEMPERATURE, F	265	265	261	261	171	172
OIL PRESSURE, PSI	58	58	57	57	53	53
COOLANT TEMPERATURE, F	190	190	190	190	176	177
EXHAUST PRESSURE, IN. H2O	46.0	20.0	39.0	16.0	1.0	1.0
EXHAUST TEMPERATURE, F	1493	1024	1503	981	290	439

* CORRECTED SAE J816B

+ CORRECTED FOR HUMIDITY

ENGINE: 1978 FORD 140-CID CALIF. 3-WAY CATALYST

	70.01	70.02	71.01	71.02	73.01	73.02
FUEL CODE: 7718						
TEST NUMBER	1	2	1	2	1	2
DATA SOURCE CODE						
TEST DATE	11/30/78	11/30/78	11/30/78	11/30/78	11/30/78	11/30/78
BAROMETER, MMHG	745.0	745.5	745.5	745.0	743.0	743.5
HUMIDITY, GRAINS/LB	43	43	43	43	45	45
TEMPERATURE, F	76	76	76	76	80	80
ENGINE SPEED, RPM	850	850	850	850	1000	1000
TORQUE, FT-LB	10.0	10.0	15.0	15.0	67.5	67.5
POWER, BHP*	1.6	1.6	2.4	2.4	12.7	12.7
FUEL RATE, LB/HR	2.4	2.3	2.6	2.6	6.4	6.4
IGNITION TIMING, DEG BTDC	37.0	37.0	37.0	37.0	25.0	25.0
MANIFOLD VACUUM, IN HG	19.0	19.0	18.5	18.5	5.4	5.4
INTAKE MAN. TEMP., F	112	113	109	109	109	111
CONCENTRATIONS, DRY BASIS						
CO, %	2.2079	.0075	1.9739	.0081	1.0555	.0082
CO2, %	10.21	7.79	10.84	8.11	12.63	11.14
O2, %	4.58	9.32	3.62	8.86	1.75	4.84
HC, PPMC	10767	136	7836	156	3204	116
NOX, PPM	149	35	245	95	556	308
AIR/FUEL RATIO	15.85	26.49	15.60	25.47	15.22	19.07
EMISSION RATES, G/HR						
CO	348.0	2.0	338.2	2.4	438.1	4.2
HC	85.2	1.8	67.4	2.3	66.8	3.0
NOX+	3.4	1.3	6.0	4.0	33.3	22.9
OIL TEMPERATURE, F	178	179	181	182	190	192
OIL PRESSURE, PSI	51	51	49	49	52	52
COOLANT TEMPERATURE, F	182	184	185	185	186	186
EXHAUST PRESSURE, IN. H2O	1.0	1.0	1.0	1.0	9.0	41.0
EXHAUST TEMPERATURE, F	374	430	400	392	745	605

* CORRECTED SAE J816B
+ CORRECTED FOR HUMIDITY

ENGINE: 1978 FORD 140-CID CALIF. 3-WAY CATALYST

FUEL CODE: 7718

TEST NUMBER

DATA SOURCE CODE

TEST DATE

BAROMETER, MMHG

HUMIDITY, GRAINS/LB

TEMPERATURE, F

ENGINE SPEED, RPM

TORQUE, FT-LB

POWER, BHP*

FUEL RATE, LB/HR

IGNITION TIMING, DEG BTDC

MANIFOLD VACUUM, IN HG

INTAKE MAN. TEMP., F

CONCENTRATIONS, DRY BASIS

CO, %

CO2, %

O2, %

HC, PPMC

NOX, PPM

AIR/FUEL RATIO

EMISSION RATES, G/HR

CO

HC

NOX+

OIL TEMPERATURE, F

OIL PRESSURE, PSI

COOLANT TEMPERATURE, F

EXHAUST PRESSURE, IN. H2O

EXHAUST TEMPERATURE, F

74.01	74.02	75.01	75.02	76.01	76.02
1	2	1	2	1	2
11/30/78	11/30/78	11/30/78	11/30/78	11/30/78	11/30/78
743.5	743.5	743.0	743.5	743.0	743.0
44	44	44	44	44	44
80	79	79	78	77	77
1000	1000	1000	1000	1000	1000
54.0	54.0	22.5	22.5	9.0	9.0
10.2	10.2	4.2	4.2	1.7	1.7
5.4	5.4	3.1	3.1	2.6	2.6
30.0	30.0	36.0	36.0	36.0	36.0
8.3	8.3	17.1	17.1	19.9	19.9
127	127	115	110	113	112
1.1126	.0066	.3519	.0079	1.8688	.0066
12.46	10.52	12.08	8.06	10.49	7.53
2.06	5.66	3.17	9.03	4.37	9.72
3330	106	2983	282	10173	125
382	191	781	369	120	40
15.39	20.07	16.75	25.71	15.95	27.41

387.6	3.1	78.1	2.7	331.4	2.1
58.3	2.5	33.2	4.8	90.6	2.0
19.1	12.7	24.8	18.1	3.0	1.8
192	192	190	189	185	184
51	51	52	52	53	53
187	187	185	185	183	183
7.0	3.0	5.0	1.0	3.0	1.0
664	518	543	437	440	374

* CORRECTED SAE J816B
+ CORRECTED FOR HUMIDITY

ENGINE: 1978 FORD 140-CID CALIF. 3-WAY CATALYST

	77.01	77.02	78.01	78.02	79.01	79.02
FUEL CODE: 7718						
TEST NUMBER	1	2	1	2	1	2
DATA SOURCE CODE						
TEST DATE	11/30/78	11/30/78	11/30/78	11/30/78	11/30/78	11/30/78
SAROMETER, MMHG	743.0	743.0	742.5	742.5	743.0	743.0
HUMIDITY, GRAINS/LB	44	44	45	45	45	45
TEMPERATURE, F	77	77	80	82	83	83
ENGINE SPEED, RPM	1000	1000	1600	1600	1600	1600
TORQUE, FT-LB	.0	.0	75.0	75.0	60.0	60.0
POWER, BHP*	.0	.0	22.6	22.6	18.1	18.1
FUEL RATE, LB/HR	2.3	2.2	10.9	10.9	9.2	9.2
IGNITION TIMING, DEG BTDC	36.0	36.0	22.0	22.0	27.0	27.0
MANIFOLD VACUUM, IN HG	21.0	21.0	5.8	5.8	8.1	8.1
INTAKE MAN. TEMP., F	119	118	98	104	126	127
CONCENTRATIONS, DRY BASIS						
CO, %	2.3210	.0062	.9125	.0081	1.0397	.0077
CO2, %	9.76	7.03	13.14	11.95	12.98	11.51
O2, %	5.00	10.41	1.48	3.88	1.61	4.61
HC, PPMC	20055	108	2606	95	2673	81
NOX, PPM	39	27	789	532	506	254
AIR/FUEL RATIO	15.06	29.28	15.16	18.00	15.18	18.74
EMISSION RATES, G/HR						
CO	341.1	1.8	630.0	6.7	602.6	5.5
HC	148.0	1.6	90.4	3.9	77.8	2.9
NOX+	.8	1.1	78.7	63.0	42.4	26.4
OIL TEMPERATURE, F	183	183	192	201	204	205
OIL PRESSURE, PSI	53	53	56	56	55	55
COOLANT TEMPERATURE, F	184	183	190	188	187	188
EXHAUST PRESSURE, IN. H2O	3.0	2.0	18.0	7.0	14.0	6.0
EXHAUST TEMPERATURE, F	393	370	967	701	946	712

* CORRECTED SAE J816B
 + CORRECTED FOR HUMIDITY

ENGINE: 1978 FORD 140-CID CALIF. 3-WAY CATALYST

FUEL CODE: 7718

TEST NUMBER

DATA SOURCE CODE

TEST DATE

BAROMETER, MMHG

HUMIDITY, GRAINS/LB

TEMPERATURE, F

ENGINE SPEED, RPM

TORQUE, FT-LB

POWER, BHP*

FUEL RATE, LB/HR

IGNITION TIMING, DEG BTDC

MANIFOLD VACUUM, IN HG

INTAKE MAN. TEMP., F

CONCENTRATIONS, DRY BASIS

CO, %

CO2, %

O2, %

HC, PPMC

NOX, PPM

AIR/FUEL RATIO

EMISSION RATES, G/HR

CO

HC

NOX+

OIL TEMPERATURE, F

OIL PRESSURE, PSI

COOLANT TEMPERATURE, F

EXHAUST PRESSURE, IN. H2O

EXHAUST TEMPERATURE, F

* CORRECTED SAE J816B

+ CORRECTED FOR HUMIDITY

	80.01	80.02	81.01	81.02	82.01	82.02
TEST NUMBER	1	2	1	2	1	2
DATA SOURCE CODE						
TEST DATE	11/30/78	11/30/78	11/30/78	11/30/78	11/30/78	11/30/78
BAROMETER, MMHG	742.5	742.5	743.0	743.0	743.0	743.0
HUMIDITY, GRAINS/LB	45	45	45	45	45	45
TEMPERATURE, F	80	80	79	79	79	79
ENGINE SPEED, RPM	1600	1600	1600	1600	1600	1600
TORQUE, FT-LB	25.0	25.0	10.0	10.0	.0	.0
POWER, BHP*	7.5	7.5	3.0	3.0	.0	.0
FUEL RATE, LB/HR	5.6	5.6	4.1	4.1	3.3	3.2
IGNITION TIMING, DEG BTDC	36.0	36.0	36.5	36.5	37.0	37.0
MANIFOLD VACUUM, IN HG	17.2	17.2	20.6	20.6	21.3	21.3
INTAKE MAN. TEMP., F	113	113	106	106	108	108
CONCENTRATIONS, DRY BASIS						
CO, %	1.9825	.0078	2.0687	.0070	.1920	.0075
CO2, %	11.76	9.81	11.36	8.24	10.66	6.87
O2, %	2.46	6.69	3.10	8.91	5.14	10.71
HC, PPMC	2926	102	2034	118	5645	122
NOX, PPM	351	172	166	86	107	51
AIR/FUEL RATIO	15.28	21.48	15.80	25.38	18.39	30.02
EMISSION RATES, G/HR						
CO	719.1	4.0	558.2	3.1	50.0	3.2
HC	53.3	2.6	27.6	2.6	73.9	2.6
NOX+	18.4	12.9	6.5	5.5	4.0	3.1
OIL TEMPERATURE, F	202	202	197	197	195	195
OIL PRESSURE, PSI	55	55	56	56	57	57
COOLANT TEMPERATURE, F	188	188	185	185	186	186
EXHAUST PRESSURE, IN. H2O	9.0	3.0	6.0	2.0	5.0	2.0
EXHAUST TEMPERATURE, F	746	604	666	461	604	370

ENGINE: 1978 FORD 140-CID CALIF. 3-WAY CATALYST

	83.01	83.02	84.01	84.02	85.01	85.02
FUEL CODE: 7718						
TEST NUMBER	1	2	1	2	1	2
DATA SOURCE CODE						
TEST DATE	12/ 1/78	12/ 1/78	12/ 1/78	12/ 1/78	12/ 1/78	12/ 1/78
BAROMETER, MMHG	740.5	740.5	740.5	740.5	740.5	740.5
HUMIDITY, GRAINS/LB	47	47	47	47	47	50
TEMPERATURE, F	79	79	81	80	80	80
ENGINE SPEED, RPM	2200	2200	2200	2200	2200	2200
TORQUE, FT-LB	79.0	79.0	63.0	63.0	26.0	26.0
POWER, BHP*	32.8	32.8	26.2	26.2	10.8	10.8
FUEL RATE, LB/HR	15.5	15.6	13.0	13.0	8.2	8.2
IGNITION TIMING, DEG 8TDC	26.0	26.0	32.0	32.0	40.0	40.0
MANIFOLD VACUUM, IN HG	5.6	5.6	8.4	8.4	15.1	15.1
INTAKE MAN. TEMP., F	96	97	112	112	153	153
CONCENTRATIONS, DRY BASIS						
CO, %	.9067	.0102	1.0044	.0096	1.7379	.0102
CO2, %	13.33	12.30	13.30	11.72	12.20	10.23
O2, %	1.51	3.73	1.45	4.46	2.30	6.61
HC, PPMC	2701	65	2537	78	2712	82
NOX, PPM	1260	843	1109	735	188	83
AIR/FUEL RATIO	15.19	17.81	15.11	18.56	15.30	21.13
EMISSION RATES, G/HR						
CO	876.3	11.6	813.0	9.6	900.6	7.4
HC	131.1	3.7	103.1	3.9	70.6	3.0
NOX+	177.3	140.2	130.7	106.9	14.2	8.8
OIL TEMPERATURE, F	210	212	215	216	211	211
OIL PRESSURE, PSI	58	58	57	57	58	58
COOLANT TEMPERATURE, F	189	189	188	189	188	188
EXHAUST PRESSURE, IN. H2O	36.0	14.0	28.0	11.0	16.0	5.0
EXHAUST TEMPERATURE, F	1161	931	1068	887	896	.755

* CORRECTED SAE J816B
 + CORRECTED FOR HUMIDITY

ENGINE: 1978 FORD 140-CID CALIF. 3-WAY CATALYST

	86.01	86.02	87.01	87.02	88.01	88.02
FUEL CODE: 7718	1	2	1	2	1	2
TEST NUMBER	12/ 1/78	12/ 1/78	12/ 1/78	12/ 1/78	12/ 1/78	12/ 1/78
DATA SOURCE CODE	740.5	740.5	740.5	740.5	740.5	740.5
TEST DATE	50	50	48	48	50	50
BAROMETER, MMHG	79	79	78	78	81	83
HUMIDITY, GRAINS/LB	2200	2200	2200	2200	2800	2800
TEMPERATURE, F	11.0	11.0	.0	.0	83.0	83.0
ENGINE SPEED, RPM	4.6	4.6	.0	.0	44.0	44.0
TORQUE, FT-LB	6.3	6.3	4.8	4.8	21.2	21.2
POWER, BHP*	39.0	39.0	39.0	39.0	23.0	23.0
FUEL RATE, LB/HR	18.4	18.4	22.0	22.0	4.4	4.4
IGNITION TIMING, DEG BTDC	146	143	107	107	92	96
MANIFOLD VACUUM, IN HG	2.2036	.0110	1.6185	.0091	.8936	.0102
INTAKE MAN. TEMP., F	11.73	9.22	12.16	8.16	13.54	12.43
CONCENTRATIONS, DRY BASIS	2.63	8.06	2.50	9.56	1.01	3.17
CO, %	2456	99	1086	95	1415	35
CO2, %	64	43	102	54	1296	911
O2, %	15.32	23.35	15.69	26.26	14.98	17.34
HC, PPMC	885.2	6.7	505.5	4.8	1175.7	15.7
NOX, PPM	49.5	3.0	17.0	2.5	93.5	2.7
AIR/FUEL RATIO	3.8	3.9	4.7	4.2	250.9	206.2
EMISSION RATES, G/HR	205	205	204	204	227	231
CO	59	59	59	59	59	59
HC	189	188	188	188	190	189
NOX+	11.0	3.0	8.0	3.0	61.0	26.0
OIL TEMPERATURE, F	859	640	801	530	1350	947
OIL PRESSURE, PSI						
COOLANT TEMPERATURE, F						
EXHAUST PRESSURE, IN. H2O						
EXHAUST TEMPERATURE, F						

* CORRECTED SAE J816B
 + CORRECTED FOR HUMIDITY

ENGINE: 1978 FORD 140-CID CALIF. 3-WAY CATALYST

	89.01	89.02	90.01	90.02	91.01	91.02
FUEL CODE: 7718						
TEST NUMBER	1	2	1	2	1	2
DATA SOURCE CODE						
TEST DATE	12/ 1/78	12/ 1/78	12/ 1/78	12/ 1/78	12/ 1/78	12/ 1/78
BAROMETER, MMHG	740.5	740.5	739.5	740.0	739.5	739.5
HUMIDITY, GRAINS/LB	50	50	50	50	48	50
TEMPERATURE, F	83	83	83	83	82	82
ENGINE SPEED, RPM	2800	2800	2800	2800	2800	2800
TORQUE, FT-LB	66.0	66.0	28.0	28.0	11.0	11.0
POWER, BHP*	35.0	35.0	14.9	14.9	5.8	5.8
FUEL RATE, LB/HR	17.3	17.4	10.8	10.8	8.3	8.3
IGNITION TIMING, DEG BTDC	32.0	32.0	41.0	41.0	40.0	40.0
MANIFOLD VACUUM, IN HG	7.5	7.5	14.7	14.7	17.7	17.7
INTAKE MAN. TEMP., F	115	115	141	141	165	165
CONCENTRATIONS, DRY BASIS						
CO, %	1.0772	.0100	1.4782	.0099	1.6841	.0099
CO2, %	12.93	11.80	12.16	10.24	12.30	9.41
O2, %	1.47	3.90	2.01	6.08	1.88	7.20
HC, PPMC	2213	56	1993	92	1280	58
NOX, PPM	1291	956	358	223	82	49
AIR/FUEL RATIO	15.14	18.08	15.32	20.62	15.19	22.30
EMISSION RATES, G/HR						
CO	1186.1	13.4	1039.2	9.4	891.6	7.8
HC	122.4	3.8	70.4	4.4	34.0	2.3
NOX+	209.3	187.2	37.1	31.1	6.3	5.7
OIL TEMPERATURE, F	232	232	223	223	220	220
OIL PRESSURE, PSI	59	59	60	60	61	61
COOLANT TEMPERATURE, F	189	189	189	189	189	189
EXHAUST PRESSURE, IN. H2O	43.0	18.0	16.0	8.0	14.0	6.0
EXHAUST TEMPERATURE, F	1175	850	1017	676	1045	601

* CORRECTED SAE J816B
 + CORRECTED FOR HUMIDITY

ENGINE: 1978 FORD 140-CID CALIF. 3-WAY CATALYST

	92.01	92.02	93.01	93.02	94.01	94.02
FUEL CODE: 7718						
TEST NUMBER	1	2	1	2	1	2
DATA SOURCE CODE						
TEST DATE	12/ 1/78	12/ 1/78	12/ 4/78	12/ 4/78	12/ 4/78	12/ 4/78
BAROMETER, MMHG	739.5	739.5	739.5	739.5	739.5	739.5
HUMIDITY, GRAINS/LB	48	48	37	37	54	37
TEMPERATURE, F	82	82	87	88	88	87
ENGINE SPEED, RPM	2800	2800	3300	3300	3300	3300
TORQUE, FT-LB	.0	.0	80.0	80.0	64.0	64.0
POWER, BHP*	.0	.0	49.9	49.9	40.1	39.9
FUEL RATE, LB/HR	7.1	7.1	24.9	24.9	20.8	20.8
IGNITION TIMING, DEG BTDC	41.0	41.0	23.0	23.0	33.5	33.5
MANIFOLD VACUUM, IN HG	19.0	19.0	4.2	4.2	7.4	7.4
INTAKE MAN. TEMP., F	180	180	99	100	118	118
CONCENTRATIONS, DRY BASIS						
CO, %	1.1790	.0102	.5677	.0054	.9323	.0062
CO2, %	12.61	8.75	14.02	12.53	13.26	12.06
O2, %	1.83	7.98	.67	2.94	1.15	3.58
HC, PPMC	1220	54	650	11	1187	25
NOX, PPM	55	34	1387	1035	1388	1015
AIR/FUEL RATIO	15.41	23.73	14.99	17.15	15.10	17.76
EMISSION RATES, G/HR						
CO	544.0	7.4	870.6	9.6	1220.6	9.7
HC	28.3	2.0	50.1	1.0	78.0	1.9
NOX+	3.7	3.6	297.4	259.2	272.5	220.9
OIL TEMPERATURE, F	216	216	242	245	244	243
OIL PRESSURE, PSI	61	61	60	60	60	60
COOLANT TEMPERATURE, F	188	188	189	189	189	188
EXHAUST PRESSURE, IN. H2O	11.0	5.0	86.0	38.0	62.0	26.0
EXHAUST TEMPERATURE, F	1101	555	1500	1151	1334	1059

* CORRECTED SAE J8168

+ CORRECTED FOR HUMIDITY

ENGINE: 1978 FORD 140-CID CALIF. 3-WAY CATALYST

	95.01	95.02	96.01	96.02	97.01	97.02
FUEL CODE: 7718						
TEST NUMBER	1	2	1	2	1	2
DATA SOURCE CODE						
TEST DATE	12/ 4/78	12/ 4/78	12/ 4/78	12/ 4/78	12/ 4/78	12/ 4/78
BAROMETER, MMHG	739.5	739.5	739.5	739.5	739.5	739.5
HUMIDITY, GRAINS/LB	37	37	37	37	37	37
TEMPERATURE, F	85	85	84	84	84	84
ENGINE SPEED, RPM	3300	3300	3300	3300	3300	3300
TORQUE, FT-LB	27.0	27.0	11.0	11.0	.0	.0
POWER, BHP*	16.8	16.8	6.9	6.9	.0	.0
FUEL RATE, LB/HR	13.1	13.0	10.3	10.4	8.6	8.7
IGNITION TIMING, DEG 8TDC	43.0	43.0	43.0	43.0	43.0	43.0
MANIFOLD VACUUM, IN HG	14.6	14.6	17.5	17.5	19.1	19.1
INTAKE MAN. TEMP., F	140	140	162	162	176	176
CONCENTRATIONS, DRY BASIS						
CO, %	1.4284	.0059	1.1396	.0058	.8101	.0053
CO2, %	12.58	10.69	13.00	9.93	13.35	9.27
O2, %	1.75	5.60	1.29	6.73	1.21	7.73
HC, PPMC	1137	42	596	21	826	22
NOX, PPM	505	322	119	65	70	38
AIR/FUEL RATIO	15.25	19.95	15.11	21.46	15.19	22.98
EMISSION RATES, G/HR						
CO	1196.6	6.4	743.5	5.4	444.4	4.5
HC	47.8	2.3	19.5	1.0	22.7	1.0
NOX+	59.2	49.6	10.9	8.6	5.4	4.5
OIL TEMPERATURE, F	236	236	231	230	228	228
OIL PRESSURE, PSI	61	61	62	62	62	62
COOLANT TEMPERATURE, F	188	189	189	189	188	188
EXHAUST PRESSURE, IN. H2O	29.0	12.0	20.0	8.0	15.0	7.0
EXHAUST TEMPERATURE, F	1185	893	1268	810	1292	748

* CORRECTED SAE J816B
+ CORRECTED FOR HUMIDITY

ENGINE: 1978 FORD 140-CID CALIF. 3-WAY CATALYST

	98.01	98.02	99.01	99.02	100.01	100.02
FUEL CODE: 7718						
TEST NUMBER	1	2	1	2	1	2
DATA SOURCE CODE						
TEST DATE	12/ 4/78	12/ 4/78	12/ 4/78	12/ 4/78	12/ 5/78	12/ 5/78
BAROMETER, MMHG	739.0	739.0	739.0	739.0	731.5	731.5
HUMIDITY, GRAINS/LB	37	37	37	37	38	38
TEMPERATURE, F	88	88	90	90	83	83
ENGINE SPEED, RPM	3900	3900	3900	3900	3900	3900
TORQUE, FT-LB	75.0	75.0	60.0	60.0	25.0	25.0
POWER, BHP*	55.3	55.3	44.3	44.3	18.6	18.6
FUEL RATE, LB/HR	29.3	29.3	24.4	24.3	15.9	16.1
IGNITION TIMING, DEG BTDC	26.0	26.0	34.0	26.0	44.0	44.0
MANIFOLD VACUUM, IN HG	4.2	4.2	7.3	7.3	14.1	14.1
INTAKE MAN. TEMP., F	97	97	119	119	124	124
CONCENTRATIONS, DRY BASIS						
CO, %	.4572	.0047	.7726	.0050	1.0017	.0092
CO2, %	14.19	12.86	13.74	12.45	13.28	11.10
O2, %	.56	2.75	.88	3.27	1.44	5.41
HC, PPMC	509	9	768	16	694	20
NOX, PPM	1502	1165	1565	1133	613	423
AIR/FUEL RATIO	14.98	16.95	15.03	17.42	15.28	19.60
EMISSION RATES, G/HR						
CO	823.2	9.8	1166.9	8.9	1005.3	12.0
HC	46.0	.9	58.3	1.4	35.0	1.3
NOX+	378.4	335.0	330.7	279.8	86.3	77.5
OIL TEMPERATURE, F	247	247	258	258	244	244
OIL PRESSURE, PSI	61	61	60	60	62	62
COOLANT TEMPERATURE, F	191	191	189	189	189	189
EXHAUST PRESSURE, IN. H2O	111.0	51.0	81.0	36.0	41.0	18.0
EXHAUST TEMPERATURE, F	1554	1197	1443	1140	1342	969

* CORRECTED SAE J816B
 + CORRECTED FOR HUMIDITY

ENGINE: 1978 FORD 140-CID CALIF. 3-WAY CATALYST

	101.01	101.02	102.01	102.02	103.01	103.02
FUEL CODE: 7718						
TEST NUMBER	1	2	1	2	1	2
DATA SOURCE CODE						
TEST DATE	12/ 5/78	12/ 5/78	12/ 5/78	12/ 5/78	12/ 6/78	12/ 6/78
BAROMETER, MMHG	731.5	731.0	731.0	731.0	746.5	746.5
HUMIDITY, GRAINS/LB	38	38	38	38	37	37
TEMPERATURE, F	85	85	85	85	91	91
ENGINE SPEED, RPM	3900	3900	3900	3900	4400	4400
TORQUE, FT-LB	10.0	10.0	.0	.0	68.0	68.0
POWER, BHP*	7.5	7.5	.0	.0	56.0	56.0
FUEL RATE, LB/HR	12.8	12.7	10.8	10.9	31.4	31.3
IGNITION TIMING, DEG BTDC	44.0	44.0	44.0	44.0	30.0	30.0
MANIFOLD VACUUM, IN HG	16.9	16.9	18.5	18.5	4.9	4.9
INTAKE MAN. TEMP., F	145	145	160	160	108	108
CONCENTRATIONS, DRY BASIS						
CO, %	.7869	.0095	.6616	.0094	.5308	.0099
CO2, %	13.74	10.37	13.91	9.69	14.24	13.17
O2, %	1.04	6.40	.96	7.24	.66	2.56
HC, PPMC	471	10	297	8	516	17
NOX, PPM	161	60	88	40	1811	1222
AIR/FUEL RATIO	15.12	20.85	15.13	22.12	15.02	16.76
EMISSION RATES, G/HR						
CO	624.9	10.5	441.7	9.6	1014.0	21.2
HC	18.8	.5	10.0	.4	49.5	1.8
NOX+	17.9	9.3	8.2	5.7	482.7	365.9
OIL TEMPERATURE, F	243	243	240	240	269	269
OIL PRESSURE, PSI	62	62	62	62	54	54
COOLANT TEMPERATURE, F	190	190	188	188	192	192
EXHAUST PRESSURE, IN. H2O	28.0	12.0	22.0	10.0	121.0	56.0
EXHAUST TEMPERATURE, F	1397	909	1414	866	1558	1203

* CORRECTED SAE J816B

+ CORRECTED FOR HUMIDITY

ENGINE: 1978 FORD 140-CID CALIF. 3-WAY CATALYST

	104.01	104.02	105.01	105.02	106.01	106.02
FUEL CODE: 7718						
TEST NUMBER	1	2	1	2	1	2
DATA SOURCE CODE						
TEST DATE	12/ 6/78	12/ 6/78	12/ 6/78	12/ 6/78	12/ 6/78	12/ 6/78
BAROMETER, MMHG	746.5	746.5	747.0	747.0	746.5	747.5
HUMIDITY, GRAINS/LB	37	37	37	37	37	37
TEMPERATURE, F	91	91	88	88	88	88
ENGINE SPEED, RPM	4400	4400	4400	4400	4400	4400
TORQUE, FT-LB	54.0	54.0	23.0	23.0	9.0	9.0
POWER, BHP*	44.5	44.5	18.9	18.9	7.4	7.4
FUEL RATE, LB/HR	26.9	26.8	18.3	18.3	14.8	14.9
IGNITION TIMING, DEG BTDC	39.0	39.0	47.0	47.0	48.0	48.0
MANIFOLD VACUUM, IN HG	7.9	7.9	14.5	14.5	17.3	17.3
INTAKE MAN. TEMP., F	121	121	135	135	147	147
CONCENTRATIONS, DRY BASIS						
CO, %	.7789	.0100	.8201	.0104	.7474	.0089
CO2, %	13.91	12.69	13.47	11.37	13.81	10.79
O2, %	.92	3.08	1.15	4.83	.92	5.65
HC, PPMC	658	16	463	14	572	11
NOX, PPM	1683	1058	733	486	206	98
AIR/FUEL RATIO	15.07	17.22	15.20	18.99	15.04	19.94
EMISSION RATES, G/HR						
CO	1282.2	19.0	942.9	15.0	683.6	11.1
HC	54.4	1.6	26.7	1.1	26.3	.7
NOX+	386.7	280.9	117.6	98.2	26.2	17.0
OIL TEMPERATURE, F	267	267	257	257	254	254
OIL PRESSURE, PSI	55	55	56	56	57	57
COOLANT TEMPERATURE, F	190	190	190	190	189	189
EXHAUST PRESSURE, IN. H2O	94.0	43.0	53.0	23.0	39.0	17.0
EXHAUST TEMPERATURE, F	1465	1138	1416	991	1459	949

* CORRECTED SAE J816B
+ CORRECTED FOR HUMIDITY

ENGINE: 1978 FORD 140-CID CALIF. 3-WAY CATALYST

FUEL CODE: 7718

	107.01	107.02	108.01	108.02	109.01	109.02
TEST NUMBER	1	2	1	2	1	2
DATA SOURCE CODE						
TEST DATE	12/ 6/78	12/ 6/78	12/ 6/78	12/ 6/78	12/ 6/78	12/ 6/78
BAROMETER, MMHG	747.5	747.5	746.5	746.5	746.5	746.5
HUMIDITY, GRAINS/LB	37	37	37	37	37	37
TEMPERATURE, F	87	87	86	89	91	91
ENGINE SPEED, RPM	4400	4400	4800	4800	4800	4800
TORQUE, FT-LB	.0	.0	65.0	65.0	52.0	52.0
POWER, BHP*	.0	.0	58.4	58.4	46.7	46.7
FUEL RATE, LB/HR	13.1	13.1	33.4	33.4	29.3	29.4
IGNITION TIMING, DEG BTDC	48.0	48.0	33.0	33.0	40.0	40.0
MANIFOLD VACUUM, IN HG	18.6	18.6	5.1	5.1	7.6	7.6
INTAKE MAN. TEMP., F	157	157	100	100	120	120
CONCENTRATIONS, DRY BASIS						
CO, %	.7748	.0092	.5974	.0099	.7031	.0093
CO2, %	13.33	10.29	13.84	12.99	13.62	12.58
O2, %	1.00	6.28	.72	2.44	.82	2.75
HC, PPMC	1861	10	764	16	595	13
NOX, PPM	95	41	1843	1415	1869	1260
AIR/FUEL RATIO	14.95	20.79	15.01	16.70	15.05	17.00
EMISSION RATES, G/HR						
CO	642.7	10.6	1241.0	22.9	1292.3	19.7
HC	77.5	.6	79.7	1.8	54.9	1.4
NOX+	11.0	6.5	534.1	458.3	479.4	370.1
OIL TEMPERATURE, F	250	250	253	268	275	275
OIL PRESSURE, PSI	57	57	56	56	53	53
COOLANT TEMPERATURE, F	188	188	190	192	190	190
EXHAUST PRESSURE, IN. H2O	33.0	13.0	133.0	63.0	110.0	50.0
EXHAUST TEMPERATURE, F	1476	945	1545	1204	1512	1187

* CORRECTED SAE J816B
+ CORRECTED FOR HUMIDITY

ENGINE: 1978 FORD 140-CID CALIF. 3-WAY CATALYST

FUEL CODE: 7718	110.01	110.02	112.02
TEST NUMBER	1	2	2
DATA SOURCE CODE	12/ 6/78	12/ 6/78	12/ 6/78
TEST DATE	746.5	746.5	746.5
BAROMETER, MMHG	37	37	37
HUMIDITY, GRAINS/LB	90	90	89
TEMPERATURE, F	4800	4800	4800
ENGINE SPEED, RPM	22.0	22.0	.0
TORQUE, FT-LB	19.8	19.8	.0
POWER, BHP*	20.0	20.0	14.8
FUEL RATE, LB/HR	50.0	50.0	50.0
IGNITION TIMING, DEG BTDC	14.2	14.2	18.1
MANIFOLD VACUUM, IN HG	135	135	150
INTAKE MAN. TEMP., F			
CONCENTRATIONS, DRY BASIS			
CO, %	.6119	.0096	.0093
CO2, %	13.59	11.63	10.64
O2, %	.98	4.31	5.74
HC, PPMC	510	11	11
NOX, PPM	873	589	78
AIR/FUEL RATIO	15.18	18.47	20.09
EMISSION RATES, G/HR			
CO	776.8	14.9	11.6
HC	32.5	.9	.7
NOX+	154.7	127.7	13.7
OIL TEMPERATURE, F	267	267	260
OIL PRESSURE, PSI	54	54	56
COOLANT TEMPERATURE, F	190	190	189
EXHAUST PRESSURE, IN. H2O	62.0	27.0	17.0
EXHAUST TEMPERATURE, F	1480	1052	1003

* CORRECTED SAE J816B
 + CORRECTED FOR HUMIDITY

ENGINE: 1978 FORD 140-CID CALIF. 3-WAY CATALYST

	113.01	113.02	114.01	114.02
FUEL CODE: 7718	1	2	1	2
TEST NUMBER	1	2	1	2
DATA SOURCE CODE				
TEST DATE	12/27/78	12/27/78	12/27/78	12/27/78
BAROMETER, MMHG	752.5	752.5	752.5	752.5
HUMIDITY, GRAINS/LB	35	35	35	35
TEMPERATURE, F	94	95	94	95
ENGINE SPEED, RPM	5000	5000	5000	5000
TORQUE, FT-LB	86.0	86.0	86.0	86.0
POWER, BHP*	80.1	80.1	80.1	80.1
FUEL RATE, LB/HR	49.1	48.9	49.1	48.9
IGNITION TIMING, DEG BTDC	27.0	27.0	27.0	27.0
MANIFOLD VACUUM, IN HG	1.5	1.5	1.5	1.5
INTAKE MAN. TEMP., F	81	82	81	82
CONCENTRATIONS, DRY BASIS				
CO, %	4.7740	4.8215	4.7740	4.8215
CO2, %	11.77	11.75	11.77	11.75
O2, %	.26	.11	.26	.11
HC, PPMC	2358	1351	2358	1351
NOX, PPM	1232	450	1232	450
AIR/FUEL RATIO	12.81	12.76	12.81	12.76
EMISSION RATES, G/HR				
CO	12610.0	12747.3	12612.9	12748.8
HC	312.8	179.4	312.9	179.4
NOX+	451.5	165.0	451.5	164.9
OIL TEMPERATURE, F	278	282	278	282
OIL PRESSURE, PSI	52	51	52	51
COOLANT TEMPERATURE, F	190	190	190	190
EXHAUST PRESSURE, IN. H2O	192.0	82.0	192.0	82.0
EXHAUST TEMPERATURE, F	1550	1215	1550	1215

* CORRECTED SAE J816B
 + CORRECTED FOR HUMIDITY

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