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HS-803 328

PERFORMANCE CHARACTERISTICS OF AUTOMOTIVE ENGINES  
IN THE UNITED STATES  
First Series - Report No. 18  
1976 Ford 400 CID (6.6 Liters), 2V

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U.S. DEPARTMENT OF ENERGY  
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NOTICE

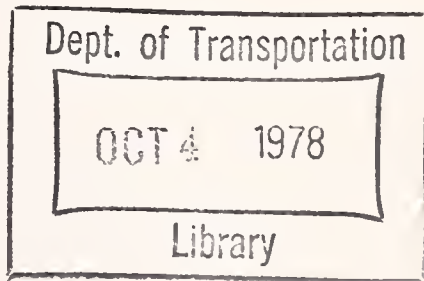
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 78-12

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16. Abstract Experimental data were obtained in dynamometer tests of a 1976 Ford 400 CID, 2V 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 Research 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 U.S. The engine used in this work is one of a series of 23 engines to be tested in the current program. This is the eighteenth of the reports to be published covering work with those engines.

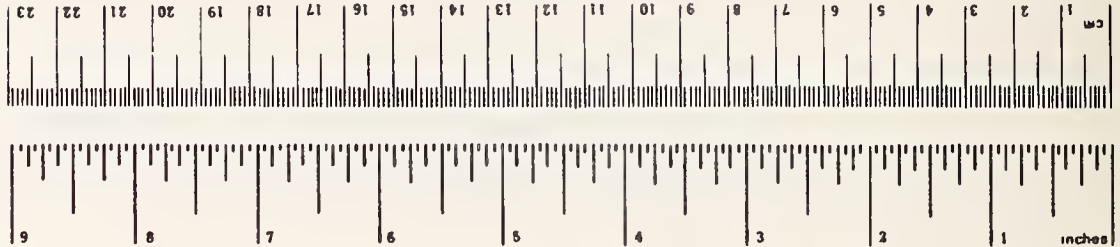
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Ralph G. Colello and James A. Kidd, Jr., of the U.S. Department of Transportation, Transportation Systems Center, are the technical monitors.

# METRIC CONVERSION FACTORS

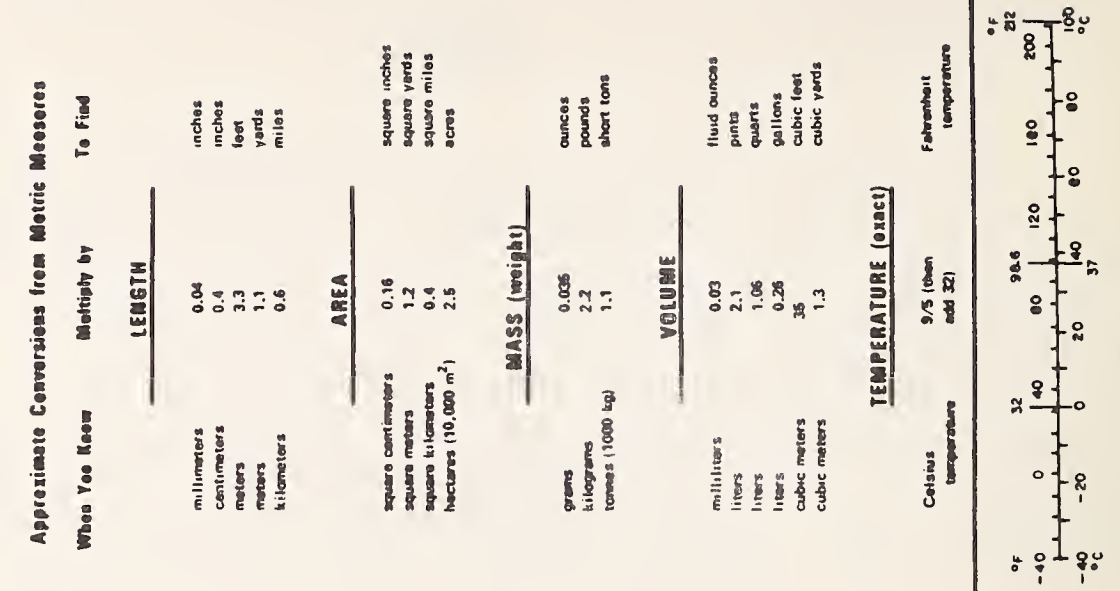
## Approximate Conversions to Metric Measures

Symbol	When You Know	Multiply by	To Find	Symbol
<b>LENGTH</b>				
in	inches	2.5	centimeters	cm
ft	feet	30	centimeters	cm
yd	yards	0.9	meters	m
mi	miles	1.5	kilometers	km
<b>AREA</b>				
in <sup>2</sup>	square inches	6.5	square centimeters	cm <sup>2</sup>
ft <sup>2</sup>	square feet	0.09	square meters	m <sup>2</sup>
yd <sup>2</sup>	square yards	0.8	square meters	m <sup>2</sup>
mi <sup>2</sup>	square miles	2.6	square kilometers	km <sup>2</sup>
	acres	0.4	hectares	ha
<b>MASS (weight)</b>				
oz	ounces	28	grams	g
lb	pounds	0.45	kilograms	kg
	short tons (2000 lb)	0.9	tonnes	t
<b>VOLUME</b>				
teaspoon	teaspoons	5	milliliters	ml
Tablespoon	tablespoons	15	milliliters	ml
fl oz	fluid ounces	30	milliliters	ml
c	cup	0.24	liters	l
pt	pint	0.47	liters	l
qt	quart	0.95	liters	l
gal	gallon	3.8	liters	l
ft <sup>3</sup>	cubic feet	0.03	cubic meters	m <sup>3</sup>
yd <sup>3</sup>	cubic yards	0.76	cubic meters	m <sup>3</sup>
<b>TEMPERATURE (exact)</b>				
°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
<b>LENGTH</b>				
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
<b>AREA</b>				
cm <sup>2</sup>	square centimeters	0.16	square inches	in <sup>2</sup>
m <sup>2</sup>	square meters	1.2	square yards	yd <sup>2</sup>
km <sup>2</sup>	square kilometers	0.4	square miles	mi <sup>2</sup>
ha	hectares (10,000 m <sup>2</sup> )	2.5	acres	acres
<b>MASS (weight)</b>				
g	grams	0.035	ounces	oz
kg	kilograms	2.2	pounds	lb
t	tonnes (1000 kg)	1.1	short tons	short tons
<b>VOLUME</b>				
ml	milliliters	0.03	fluid ounces	fl oz
l	liters	2.1	pints	pt
l	liters	1.06	quarts	qt
l	liters	0.26	gallons	gal
m <sup>3</sup>	cubic meters	35	cubic feet	ft <sup>3</sup>
m <sup>3</sup>	cubic meters	1.3	cubic yards	yd <sup>3</sup>
<b>TEMPERATURE (exact)</b>				
°C	Celsius temperature	9/5 (then add 32)	Fahrenheit temperature	°F





## 1. INTRODUCTION

This report presents data acquired from tests of a 1976 Ford 400 CID, 2V engine. Ford uses this engine in Ford and Mercury full-size vehicles (Custom, LTD, etc.). The test results are sufficient to establish steady-state maps for engine performance, fuel consumption, and emission rates (carbon monoxide, unburned hydrocarbon, and oxides of nitrogen) over the entire operating range of the engine.

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

## 2. ENGINE TEST REPORT

General engine specifications for the Ford 400 CID, 2V engine are given in table 1. The engine break-in (table 2) and tests were run using a single batch of unleaded regular grade gasoline; a fuel analysis is given in table 3.

The engine break-in and tests were conducted with a new mean-tolerance engine mounted on a test stand and coupled to an eddy-current dynamometer. The engine was complete with the exception of a fan, and a cooling tower was used in place of the radiator. The engine was equipped with an alternator, but it was not wired into the engine's electrical system. The operative emission control systems included an oxidation catalyst, exhaust-gas-recirculation (EGR), and air injection.

The engine was operated at various speeds and loads designed to approximate road-load conditions over a 45-hour period for break-in (see table 2). The engine tests began on 25 May, and ended on 17 June 1976, giving a total engine operating time of approximately 110 hours. The engine was tested while operating at the following steady-state modes:

Speeds: 850; 1,000; 1,600; 1,800; 2,200; 2,600; 3,000; 3,500 rpm

Loads: 0, 10, 25, 40, 60, 75, 90, 100 pct of full load  
(Repeated at 10, 25, 40, 75, 100 pct of full load for all speeds except 3,500 rpm)

Idle speed loads: 0, 1.5, 3.0 bhp (Repeated at each condition)

Total number of test modes..... 70  
Total repeats..... 41  
Total number of tests..... 111.

The following data were recorded at each test point:

Test number  
Date  
Barometric pressure, mm Hg  
Dewpoint, °F  
Inlet air temperature, °F  
Speed, rpm  
Torque, lb-ft -- BLH strain gage load cell; Daytronics indicator  
Fuel rate, lb/hr -- Fluidyne positive displacement fuel flowmeter  
Ignition timing, °BTC  
Manifold vacuum, in. Hg  
Throttle angle, deg  
CO, pct -- Beckman NDIR



CO<sub>2</sub>, pct - Beckman NDIR  
 O<sub>2</sub>, pct -- Beckman polarographic detector  
 HC, ppmC -- Custom-built heated flame ionization detector  
 NO<sub>x</sub>, ppm -- Thermo-Electron chemiluminescent detector  
 Oil temperature, °F  
 Oil pressure, psig  
 Coolant temperature, °F  
 Exhaust temperature, °F  
 Exhaust pressure, in. H<sub>2</sub>O  
 Intake manifold temperature, °F.

The computed data include absolute humidity (grains per pound dry air), power (bhp), air-fuel ratio (includes air injection), and emission rates of carbon monoxide (CO), unburned hydrocarbons (HC), and oxides of nitrogen (NO<sub>x</sub>) in grams per hour. The following equations were applied in the computations:

$$W = \exp 12.02 \left( \frac{D - 1.4}{D + 212} \right),$$

$$H = \frac{4348 W}{B - W},$$

$$P = \left( \frac{N \times T}{5252} \right) \left( \frac{736.6}{B - W} \right) \left( \frac{t + 460}{545} \right)^{0.5},$$

$$A/F = 4.895 \frac{(CO) + 2(CO_2) + 2(O_2) + \left( \frac{NO_x}{10^4} \right) + 3.148(CO_2) \left( \frac{CO + CO_2}{CO + 3CO_2} \right)}{(CO) + (CO_2) + \left( \frac{HC}{10^4} \right) 1 + 0.03148(CO_2) \left( \frac{CO + CO_2}{CO + 3CO_2} \right)}.$$

The equation for A/F is based on:

$$\text{Fuel} = CH_{2.099},$$

$$\text{Water-gas-shift equilibrium constant} = \frac{(CO) (H_2O)}{(CO_2) (H_2)} = 3,$$

HC was determined on a raw exhaust, wet basis, all other species measured on a dry basis.

$$\text{Mass CO} = \left( \frac{M_{\text{ex}}}{C_w} \right) \left( \frac{\text{CO}}{100} \right) \left( \frac{MW_{\text{CO}}}{MW_{\text{ex}}} \right) 453.59237,$$

where  $MW_{\text{CO}}$  = molecular weight of CO (=28.01115),  
 $MW_{\text{ex}}$  = molecular weight of exhaust gas (=28.967),

$$C_w = \text{correction for water removal} = 1 + \frac{\left( \frac{x}{2} \right) (\text{CO} + \text{CO}_2) - \text{H}_2}{100}$$

$$\text{Mass HC} = 0.0002207 (F) (A/F + 1) (\text{HC}),$$

$$\text{Mass NO}_x = 0.0007201 (F) (A/F + 1) (\text{NO}_x) \left[ \frac{1}{1 + 0.03148(\text{CO}_2) \left( \frac{\text{CO} + \text{CO}_2}{\text{CO} + 3\text{CO}_2} \right)} \right] (K_H),$$

where  $K_H$  is the humidity correction factor (dimensionless).

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

where  $A/F$  = air-fuel ratio

$B$  = barometric pressure, mm Hg

$\text{CO}$  = carbon monoxide concentration, pct, vol

$\text{CO}_2$  = carbon dioxide concentration, pct, vol

$D$  = intake air dew point, °F

$F$  = fuel rate, lb/hr

$H$  = humidity, grains  $\text{H}_2\text{O}/\text{lb}$  dry air

$\text{HC}$  = unburned hydrocarbon concentration, ppmC; vol

$K_H$  = humidity correction factor

$N$  = engine speed, rpm

$\text{NO}_x$  = nitrogen oxides concentration, ppm, vol

$\text{O}_2$  = oxygen concentration, pct, vol

P = corrected power, brake horsepower

t = intake air temperature, °F

T = torque, ft-lb

W = water vapor pressure, mm Hg.

### 3. DISCUSSION OF TEST RESULTS

Engine performance at wide-open-throttle (WOT) showed that the peak torque and brake horsepower values produced by the test engine (figure 1) were slightly in excess of those figures quoted in table 1. The brake specific fuel consumption at WOT showed some variability, possibly due to slight fuel metering inaccuracy. Air-fuel ratio was found to be repeatable over the entire operating range of the engine (figure 2). The values for air-fuel ratio, however, do not reflect the actual stoichiometry in the combustion chamber due to the influence of the air-injection system. Fuel consumption rates at engine speeds below 2,600 rpm show a typical dependence on power output (figure 3). At engine speed above 2,600 rpm and above power output levels of 75 pct of full load the rate of change of fuel consumption with power output becomes smaller. Emissions of HC and CO were maintained at low levels except near WOT conditions and also near no-load conditions for some engine speeds (figures 4 and 5). Maximum levels of NO<sub>x</sub> emissions occur typically at 90 to 100 pct of full load for each engine speed (figure 6).

The repeatability of emission rates, fuel consumption, and performance data are satisfactory for the purposes of this test.

#### 4. CONCLUSIONS

The purpose of the experimental work here is to establish data for this engine. Those data are presented in the tables accompanying this report.

TABLE 1. GENERAL ENGINE SPECIFICATIONS

Displacement.....	400 cu. in.
Maximum brake horsepower*.....	165 hp @ 3,500 rpm
Maximum torque*.....	329 ft-lb @ 1,800 rpm
Bore and stroke.....	4.00 in. x 4.00 in.
Configuration.....	90° V 8 cylinders
Compression ratio.....	8.0
Firing order.....	1-3-7-2-6-5-4-8
Ignition timing at idle speed**.....	12° BTC @ 650 rpm
Block material.....	Cast iron
Head material.....	Cast iron
Number of crankshaft mainbearings.....	5
Number of compression rings/piston.....	2
Number of oil rings/piston.....	1
Cam drive.....	Chain
Valve lift:	
Intake.....	0.428 in.
Exhaust.....	0.433 in.
Valve port size:	
Intake.....	2.04 in.
Exhaust.....	1.65 in.
Valve timing:	
Intake, opens.....	17° BTC
Intake, closes.....	59° ABC
Exhaust, opens.....	65° BBC
Exhaust, closes.....	27° ATC
Spark plug gap.....	0.044 in.
Distributor specifications:	
Centrifugal advance begins <sup>+</sup> .....	1° @ 500 rpm
Centrifugal advance, intermediate <sup>+</sup> ..	4.5° @ 650 rpm
Centrifugal advance, intermediate <sup>+</sup> ..	8.375° @ 1,500 rpm
Centrifugal advance, full <sup>+</sup> .....	14° @ 2,500 rpm
Vacuum advance, begins <sup>+</sup> .....	0° @ 3 in. Hg
Vacuum advance, maximum <sup>+</sup> .....	15-1/2 @ 11-1/2 in. Hg
Exhaust gas recirculation system:	
Valve type.....	Tapered stem
Control signal.....	Manifold and venturi vacuum
Point of discharge.....	EGR spacer
Crankcase emission control:	
Control method.....	Positive crankcase ventilation
Point of discharge.....	Air cleaner
Carburetor type.....	2V downdraft

\* Average estimated net (SAE J-245).

\*\*Vacuum advance disconnected and plugged.

+ Distributor degrees at distributor rpm.



TABLE 2. ENGINE BREAK-IN SCHEDULE

Simulated Vehicle Speed, mph	Engine Speed, rpm	Manifold Vacuum, in. Hg	Fraction of Time in Mode
0	550	17.75	1/10
20	900	19.5	"
30	1,150	16.5	"
40	1,550	16	"
50	1,900	14.25	"
60	2,250	12.25	"
25	1,050	17.75	"
35	1,400	16.25	"
45	1,700	16	"
55	2,100	12.75	"

Mileage per cycle = 90 miles.

Total mileage accumulated over the 45-hour break-in period = 1,620 miles.

TABLE 3. FUEL SPECIFICATIONS

Fuel No.....	7602
Research octane No.....	91.5
Motor octane No.....	83.8
Reid vapor pressure, psig.....	11.9
Distillation, °F:	
10 pct.....	134
50 pct.....	214
95 pct.....	388
100 pct.....	418
API gravity, deg.....	67.0
FIA analysis, pct:	
Aromatics.....	11
Olefins.....	16
Paraffins.....	73
Sulfur, pct.....	0.024
Lead, g/gal.....	Trace
Hydrogen/carbon atomic ratio.....	2.09
Specific gravity.....	0.7126

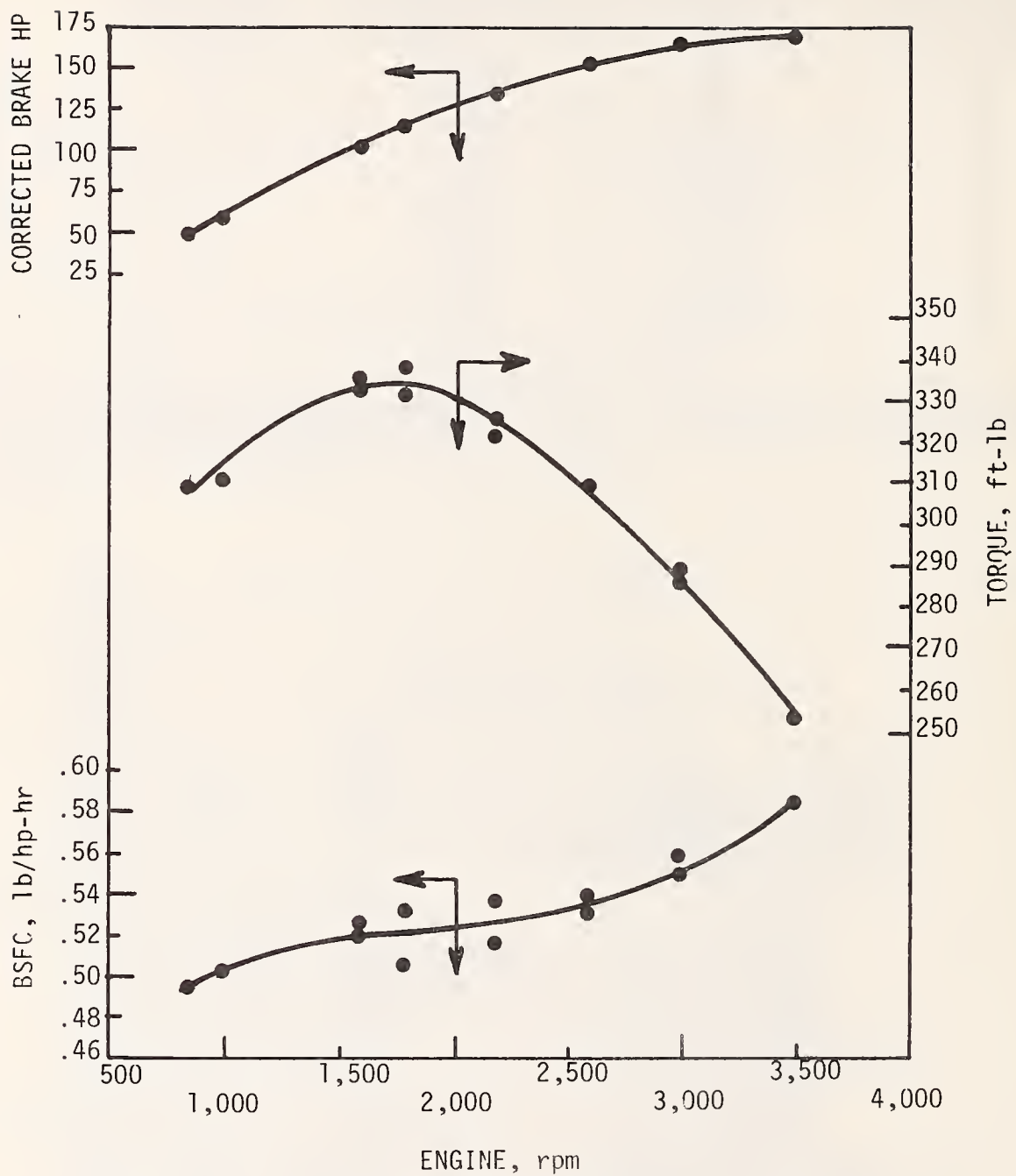


FIGURE 1. Brake Specific Fuel Consumption, Torque and Brake Horsepower versus Engine rpm at Wide-Open-Throttle--400-CID Ford Engine.

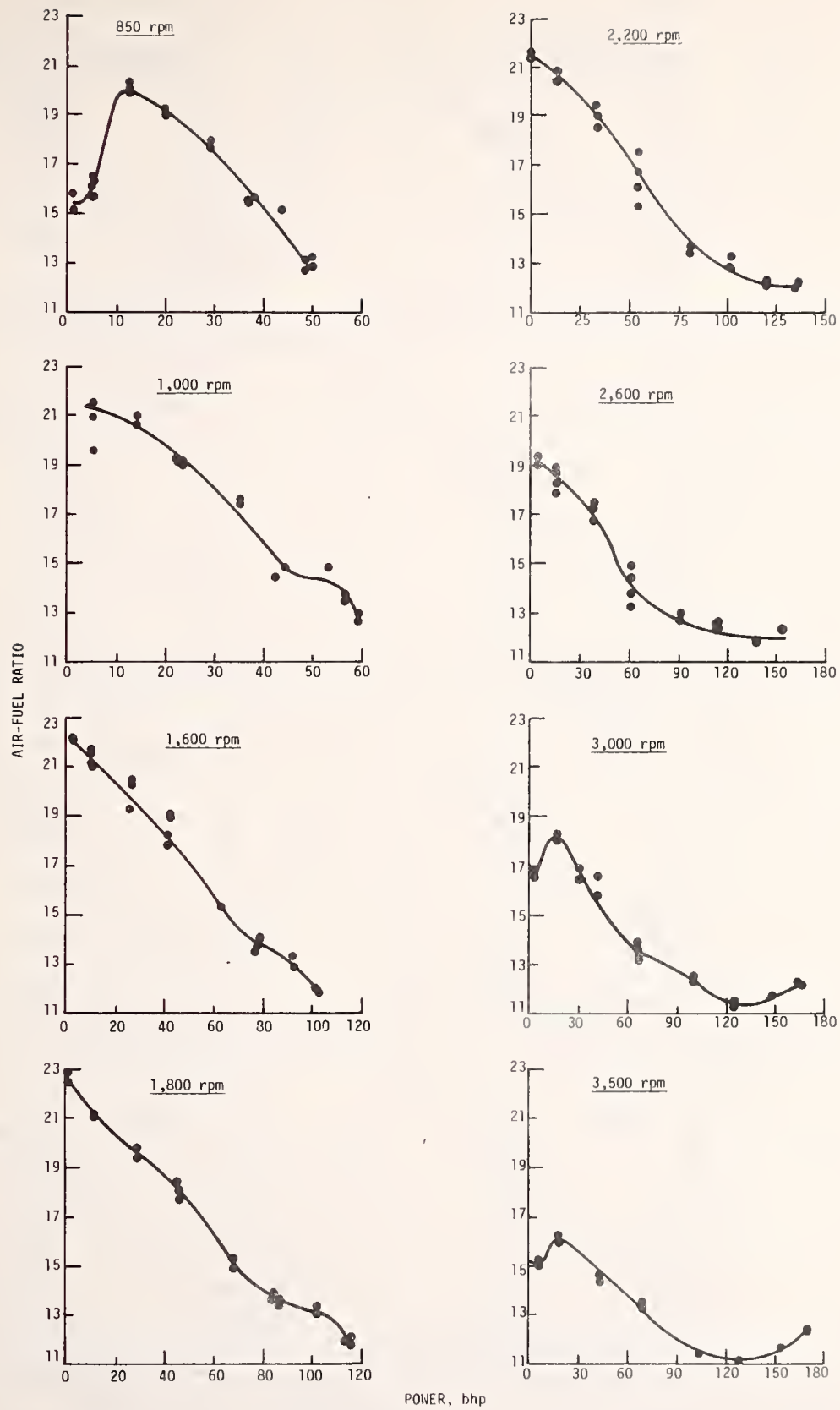


FIGURE 2. Air/Fuel Ratio versus Power at Various Speed and Load Conditions--400-CID Ford Engine.

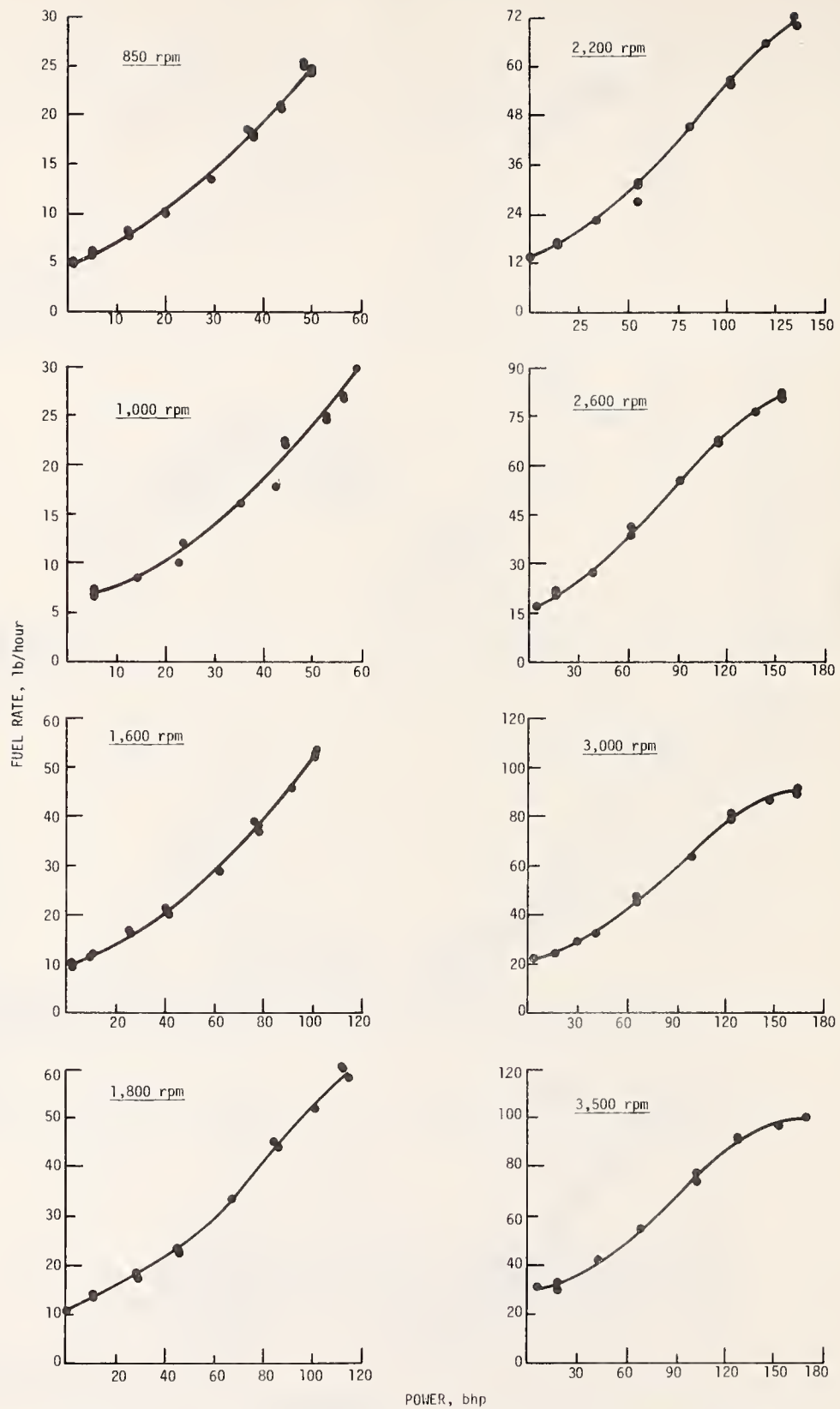


FIGURE 3. Fuel Rate versus Power at Various Speed and Load Conditions--400-CID Ford Engine.

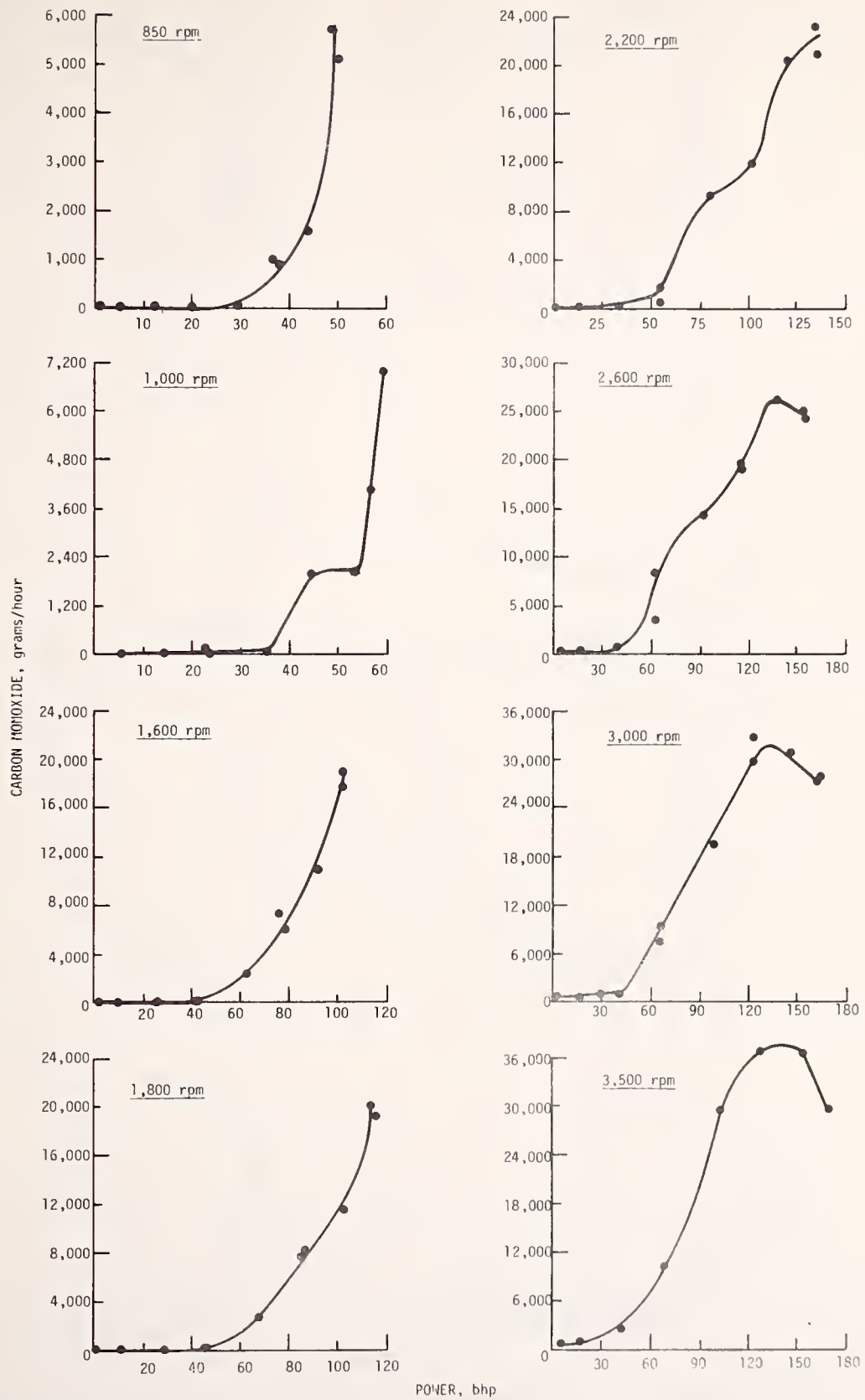


FIGURE 4. Carbon Monoxide Emissions versus Power at Various Speed and Load Conditions-- 400-CID Ford Engine.

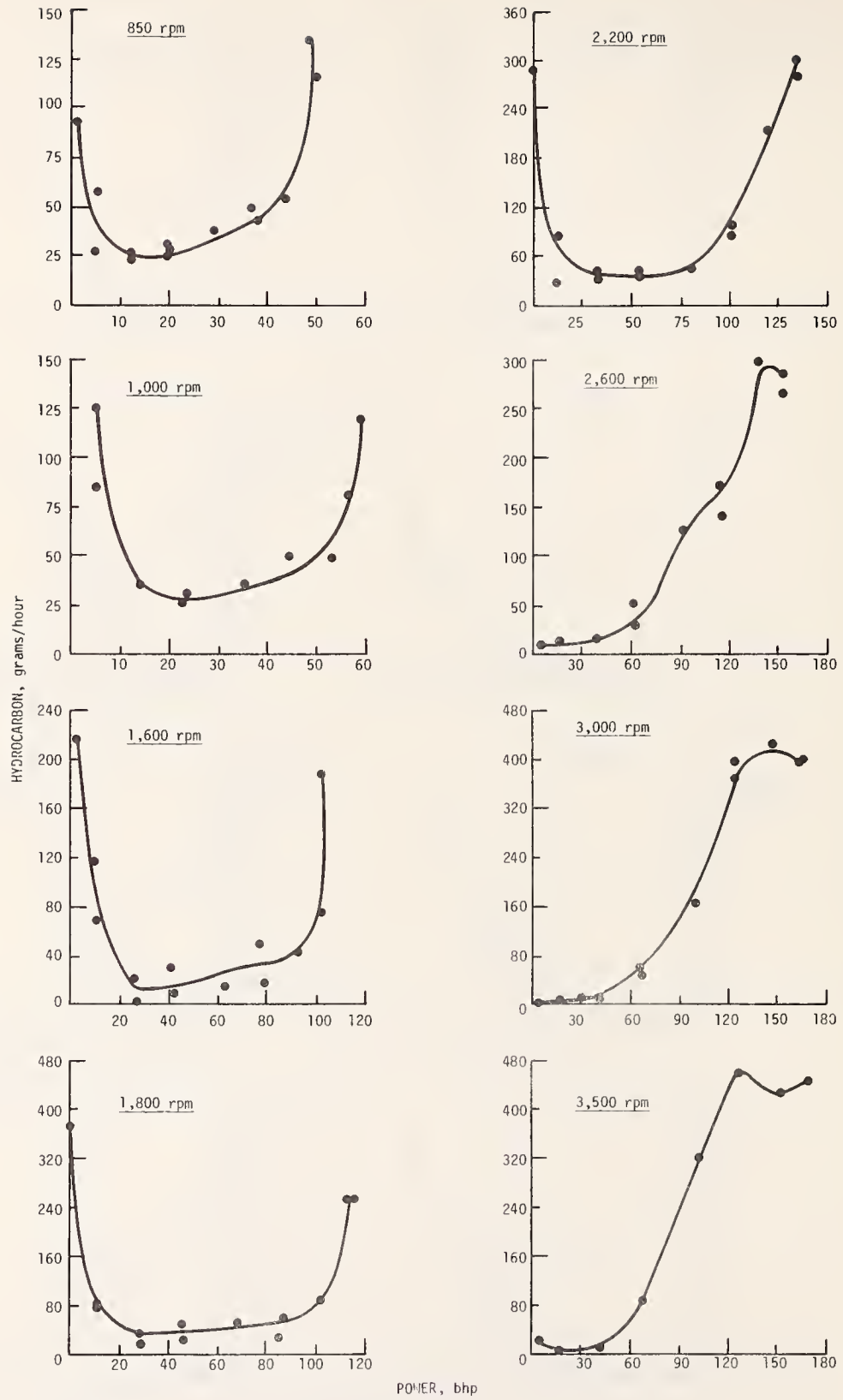


FIGURE 5. Hydrocarbon Emissions versus Power at Various Speed and Load Conditions--400 CID Ford Engine.



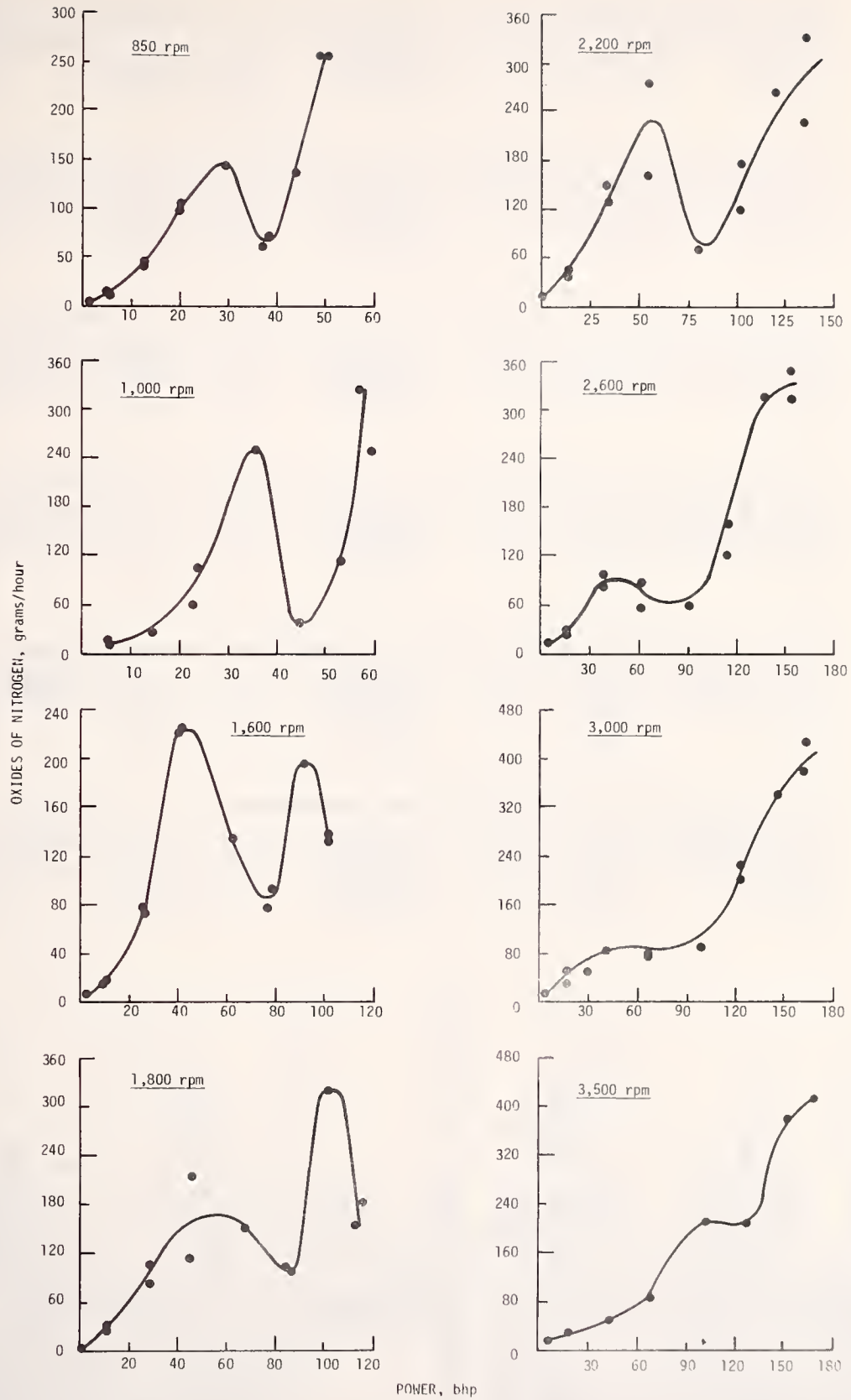


FIGURE 6. Oxides of Nitrogen Emissions versus Power at Various Speed and Load Conditions--400-CID Ford Engine.

ENGINE: FORD 400 CID

FUEL CODE: 7602

TEST NUMBER

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

THROTTLE ANGLE, DEG

INTAKE MAN. TEMP., F

1.1	1.2	2.1	2.2	3.1	3.2
6/ 9/76	6/ 9/76	6/ 9/76	6/ 9/76	6/ 9/76	6/ 9/76
744.3	744.3	744.3	744.3	744.3	744.3
59	59	59	59	59	59
92	92	82	82	82	82
650	650	650	650	650	650
.5	.5	10.0	10.0	20.0	20.0
.1	.1	1.2	1.2	2.5	2.5
3.6	3.6	4.2	4.2	4.1	4.2
39.0	39.0	38.0	38.0	38.0	38.0
20.0	20.0	20.0	20.0	19.5	19.5
.0	.0	.0	.0	.0	.0
157	157	123	123	121	121

CONCENTRATIONS, DRY BASIS

CO, %

CO2, %

O2, %

HC, PPMC

NOX, PPM

.7000	.2011	.7000	.1671	.5250	.1420
11.11	12.25	12.13	12.75	12.75	12.87
4.40	3.00	2.70	2.25	1.80	1.80
28022	11295	18670	8508	11368	5677
18	15	35	25	65	40

AIR/FUEL RATIO

14.65	15.71	14.47	15.48	14.69	15.49
-------	-------	-------	-------	-------	-------

EMISSION RATES, G/HR

CO

HC

NOX+

153.6	46.7	176.5	45.0	129.1	38.2
309.9	132.3	237.2	115.5	140.9	77.0
.6	.5	1.4	1.0	2.5	1.7

OIL TEMPERATURE, F

OIL PRESSURE, PSI

COOLANT TEMPERATURE, F

EXHAUST PRESSURE, IN. H2O

EXHAUST TEMPERATURE, F

186	186	182	182	184	184
26	26	27	27	27	27
187	187	187	187	183	183
13.0	27.0	20.0	1.0	5.0	1.0
361	516	377	501	390	471

\* CORRECTED SAE J816B

+ CORRECTED FOR HUMIDITY

ENGINE: FORD 400 CID  
 FUEL CODE: 7602

TEST NUMBER	4.1	4.2	5.1	5.2	6.1	6.2
TEST DATE	6/ 9/76	6/ 9/76	6/ 9/76	6/ 9/76	6/ 9/76	6/ 9/76
BAROMETER, MMHG	744.3	744.3	744.3	744.3	744.3	744.3
HUMIDITY, GRAINS/LB	59	59	59	59	59	59
TEMPERATURE, F	82	82	82	82	82	82
ENGINE SPEED, RPM	750	750	750	750	750	750
TORQUE, FT-LB	.2	.2	10.2	10.2	20.0	20.0
POWER, BHP*	.0	.0	1.5	1.5	2.9	2.9
FUEL RATE, LB/HR	4.1	4.2	4.2	4.3	4.5	4.7
IGNITION TIMING, DEG BTDC	38.0	38.0	37.0	37.0	38.5	38.5
MANIFOLD VACUUM, IN HG	20.5	20.5	20.5	20.5	20.0	20.0
THROTTLE ANGLE, DEG	.0	.0	.0	.0	1.0	1.0
INTAKE MAN. TEMP., F	122	122	121	121	153	153

CONCENTRATIONS, DRY BASIS

CO, %	.1882	.1882	.7000	.2380	.5669	.1890
CO2, %	12.37	12.37	12.50	12.87	12.88	13.01
O2, %	2.60	2.60	2.00	1.90	1.75	1.92
HC, PPMC	11306	11306	14193	6817	8539	4549
NOX, PPM	17	17	46	27	85	78

AIR/FUEL RATIO

AIR/FUEL RATIO	15.42	15.42	14.46	15.38	14.93	15.67
----------------	-------	-------	-------	-------	-------	-------

EMISSION RATES, G/HR

CO	49.1	50.3	177.4	64.5	157.8	57.3
HC	148.6	152.2	181.3	93.1	119.8	69.5
NOX+	.7	.7	1.8	1.1	3.6	3.6

OIL TEMPERATURE, F  
 OIL PRESSURE, PSI  
 COOLANT TEMPERATURE, F  
 EXHAUST PRESSURE, IN. H2O  
 EXHAUST TEMPERATURE, F

OIL TEMPERATURE, F	185	185	186	186	189	189
OIL PRESSURE, PSI	30	30	29	29	29	29
COOLANT TEMPERATURE, F	181	181	184	184	187	187
EXHAUST PRESSURE, IN. H2O	5.0	2.0	5.0	2.0	.0	.0
EXHAUST TEMPERATURE, F	386	522	405	516	472	565

\* CORRECTED SAE J816B  
 + CORRECTED FOR HUMIDITY

ENGINE: FORD 400 CID

FUEL CODE: 7602

TEST NUMBER

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

THROTTLE ANGLE, DEG

INTAKE MAN. TEMP., F

	7.1	7.2	8.1	8.2	9.1	9.2
5/25/76	742.0	742.0	742.0	742.0	742.0	742.0
	57	57	57	57	57	57
	76	76	77	77	78	78
	850	850	850	850	850	850
	300.0	300.0	270.0	270.0	226.0	226.0
	48.4	48.4	43.6	43.6	36.6	36.6
	25.0	25.4	21.0	20.7	18.3	18.6
	13.5	13.5	13.5	13.5	13.5	13.5
	0	0	2.0	2.0	2.5	2.5
	79.0	79.0	27.0	27.0	23.0	23.0
	88	88	112	112	149	149

CONCENTRATIONS, DRY BASIS

CO, %	4.8900
CO2, %	11.21
O2, %	.12
HC, PPMC	1892
NOX, PPM	940
AIR/FUEL RATIO	12.70

1.2400	1.5200	1.5200	1.5200	1.5200	1.5200
12.88	12.13	12.13	12.13	12.13	12.13
1.45	2.20	2.20	2.20	2.20	2.20
834	1336	1336	1336	1336	1336
700	400	400	400	400	400
15.23	15.57	15.57	15.57	15.57	15.57

EMISSION RATES, G/HR

CO	6399.7
HC	124.8
NOX+	186.5

1602.5	1781.3	1781.3	1781.3	1781.3	1781.3
54.3	78.9	78.9	78.9	78.9	78.9
137.2	71.1	71.1	71.1	71.1	71.1
208	206	206	206	206	206
26	28	28	28	28	28
167	185	185	185	185	185
14.0	19.0	19.0	19.0	19.0	19.0
996	727	727	727	727	727

OIL TEMPERATURE, F

OIL PRESSURE, PSI

COOLANT TEMPERATURE, F

EXHAUST PRESSURE, IN. H2O

EXHAUST TEMPERATURE, F

213	213	208	208	208	206
25	25	26	26	26	28
166	166	167	167	167	185
22.0	15.0	24.0	24.0	19.0	11.0
695	836	723	723	727	946

\* CORRECTED SAE J8168

+ CORRECTED FOR HUMIDITY



ENGINE: FORD 400 CID

FUEL CODE: 7602

TEST NUMBER

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

THROTTLE ANGLE, DEG

INTAKE MAN. TEMP., F

10.1	11.1	11.2	12.1	12.2
5/25/76	5/25/76	5/25/76	5/25/76	5/25/76
742.0	742.0	742.0	742.0	742.0
57	57	57	57	57
79	77	77	78	78
850	850	850	850	850
180.0	121.0	121.0	76.0	76.0
29.1	19.6	19.6	12.3	12.3
13.4	9.9	10.0	7.8	8.1
30.0	39.0	39.0	43.0	43.0
7.0	12.0	12.0	16.5	16.5
12.5	8.0	8.0	5.5	5.5
154	127	127	121	121

CONCENTRATIONS, DRY BASIS

.1180	.0424	.0332	.0607	.0332
12.02	11.01	11.22	10.60	10.90
3.75	5.25	5.00	6.25	5.75
1166	1227	782	1333	813
1075	850	820	375	410

AIR/FUEL RATIO

17.71	19.32	19.11	20.34	19.87
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EMISSION RATES, G/HR

115.5	33.6	26.1	39.7	22.0
57.5	49.0	31.0	44.0	27.1
159.6	102.1	97.7	37.2	41.2

OIL TEMPERATURE, F

OIL PRESSURE, PSI

COOLANT TEMPERATURE, F

EXHAUST PRESSURE, IN. H2O

EXHAUST TEMPERATURE, F

204	193	193	199	199
28	30	30	29	29
195	187	187	179	179
13.0	8.0	4.0	5.0	2.0
625	505	636	508	612

\* CORRECTED SAE J816B

+ CORRECTED FOR HUMIDITY

ENGINE: FORD 400 CID

FUEL CODE: 7602

TEST NUMBER

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

THROTTLE ANGLE, DEG

INTAKE MAN. TEMP., F

	13.1	13.2	14.1	14.2	15.1	15.2
	5/25/76	5/25/76	5/25/76	5/25/76	6/9/76	6/9/76
	742.0	742.0	742.0	742.0	744.3	744.3
	57	57	57	57	59	59
	79	79	79	79	82	82
	850	850	850	850	1000	1000
	30.0	30.0	7.8	7.8	310.0	310.0
	4.9	4.9	1.3	1.3	59.1	59.1
	5.9	5.8	4.9	5.0	29.7	29.6
	42.0	42.0	41.0	41.0	18.5	18.5
	19.5	19.5	20.5	20.5	.0	.0
	4.0	4.0	3.0	3.0	78.5	78.5
	118	118	118	118	91	91

CONCENTRATIONS, DRY BASIS

CO, %

CO2, %

O2, %

HC, PPMC

NOX, PPM

	2205	.0940	.4180	.1890	4.8900	4.3800
	13.27	13.40	12.26	13.27	11.11	11.33
	2.15	2.00	3.25	2.25	.07	.18
	5701	1426	16965	5700	1633	1489
	250	245	80	105	900	1025

AIR/FUEL RATIO

	15.68	16.12	15.15	15.76	12.68	12.96
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EMISSION RATES, G/HR

CO

HC

NOX+

	84.0	36.0	127.6	61.3	7608.6	6920.2
	109.5	27.5	261.0	93.2	128.0	118.6
	14.4	14.2	3.7	5.2	214.8	248.4

OIL TEMPERATURE, F

OIL PRESSURE, PSI

COOLANT TEMPERATURE, F

EXHAUST PRESSURE, IN. H2O

EXHAUST TEMPERATURE, F

	198	198	195	195	214	214
	30	30	32	32	27	27
	181	181	188	188	195	195
	1.0	.0	1.0	.0	27.0	16.0
	475	575	427	599	729	852

\* CORRECTED SAE J8168

+ CORRECTED FOR HUMIDITY



ENGINE: FORD 400 CID  
 FUEL CODE: 7602

TEST NUMBER	16.1	16.2	17.1	17.2	18.1	18.2
TEST DATE	6/ 9/76	6/ 9/76	6/ 9/76	6/ 9/76	6/ 9/76	6/ 9/76
BAROMETER, MMHG	744.3	744.3	744.3	744.3	744.3	744.3
HUMIDITY, GRAINS/LB	59	59	59	59	59	59
TEMPERATURE, F	82	82	82	82	83	83
ENGINE SPEED, RPM	1000	1000	1000	1000	1000	1000
TORQUE, FT-LB	279.0	279.0	233.0	233.0	185.0	185.0
POWER, BHP*	53.1	53.1	44.4	44.4	35.3	35.3
FUEL RATE, LB/HR	24.6	24.2	22.1	21.8	15.7	15.8
IGNITION TIMING, DEG BTDC	18.5	18.5	20.0	20.0	38.5	38.5
MANIFOLD VACUUM, IN HG	2.0	2.0	2.8	2.8	7.5	7.5
THROTTLE ANGLE, DEG	29.0	29.0	23.0	23.0	13.0	13.0
INTAKE MAN. TEMP., F	120	120	161	161	161	161

CONCENTRATIONS, DRY BASIS

CO, %	2.3300	1.3500	2.6600	1.4800	.1125	.0700
CO2, %	11.78	12.88	11.55	12.75	12.26	12.26
O2, %	1.67	1.00	1.99	1.05	3.40	3.47
HC, PPMC	1024	658	1280	743	1072	621
NOX, PPM	680	500	225	180	1400	1425

AIR/FUEL RATIO

AIR/FUEL RATIO	14.83	14.88	14.85	14.83	17.41	17.56
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EMISSION RATES, G/HR

CO	3494.0	1993.8	3586.5	1962.7	126.0	79.8
HC	77.4	48.9	87.0	49.7	60.5	35.6
NOX+	156.4	113.3	46.5	36.6	240.5	249.0

OIL TEMPERATURE, F	212	212	206	206	205	205
OIL PRESSURE, PSI	28	28	28	28	30	30
COOLANT TEMPERATURE, F	185	185	178	178	189	189
EXHAUST PRESSURE, IN. H2O	27.0	17.0	22.0	12.0	7.0	8.0
EXHAUST TEMPERATURE, F	772	1032	734	1001	641	786

\* CORRECTED SAE J816B  
 + CORRECTED FOR HUMIDITY

ENGINE: FORD 400 CID

FUEL CODE: 7602

TEST NUMBER

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

THROTTLE ANGLE, DEG

INTAKE MAN. TEMP., F

19.1	19.2	21.1	21.2	23.1	23.2
6/ 9/76	6/ 9/76	5/27/76	5/27/76	6/17/76	6/17/76
744.3	744.3	745.4	745.4	740.6	740.6
59	59	63	63	62	62
83	83	77	77	81	81
1000	1000	1000	1000	1600	1600
124.0	124.0	28.4	28.4	333.0	333.0
23.6	23.6	5.4	5.4	102.0	102.0
11.8	11.8	6.8	7.0	53.6	53.6
45.0	45.0	40.0	40.0	24.0	24.0
12.0	12.0	19.0	19.0	.0	.0
9.0	9.0	4.5	4.5	79.0	79.0
157	157	130	130	88	88

CONCENTRATIONS, DRY BASIS

.0561	.0332	.7380	.0607	7.3900	7.1900
11.22	11.33	10.19	10.19	9.89	9.89
4.93	4.80	6.50	7.00	.08	.07
1146	671	3890	2767	572	572
920	730	93	167	325	320

AIR/FUEL RATIO

18.99	18.91	19.55	20.96	11.79	11.84
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EMISSION RATES, G/HR

52.1	30.7	404.3	37.1	19397.5	18959.9
53.6	31.3	107.4	85.2	75.7	76.0
131.0	103.6	7.9	15.9	132.1	130.6

OIL TEMPERATURE, F

OIL PRESSURE, PSI

COOLANT TEMPERATURE, F

EXHAUST PRESSURE, IN. H2O

EXHAUST TEMPERATURE, F

202	202	206	206	230	230
32	32	30	30	33	33
175	175	186	186	196	196
11.0	5.0	5.0	3.0	69.0	48.0
598	704	513	672	864	1032

\* CORRECTED SAE J8168

+ CORRECTED FOR HUMIDITY

ENGINE: FORD 400 CID

FUEL CODE: 7602

TEST NUMBER

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

THROTTLE ANGLE, DEG

INTAKE MAN. TEMP., F

	24.1	24.2	25.1	25.2	26.1	26.2
	6/17/76	6/17/76	6/15/76	6/15/76	6/15/76	6/15/76
	740.6	740.6	742.1	742.1	742.1	742.1
	62	62	60	60	60	60
	82	82	81	81	84	84
	1600	1600	1600	1600	1600	1600
	300.0	300.0	257.0	257.0	205.0	205.0
	91.9	91.9	78.5	78.5	62.8	62.8
	45.9	45.8	37.0	38.1	29.0	28.7
	22.0	22.0	25.0	25.0	39.0	39.0
	1.5	1.5	3.0	3.0	6.5	6.5
	43.0	43.0	33.0	33.0	23.5	23.5
	107	107	162	162	194	194

CONCENTRATIONS, DRY BASIS

CO, %	5.7700	4.3700	3.8600	2.7800	2.6200	1.3100
CO2, %	10.09	11.32	10.90	11.89	11.00	12.37
O2, %	1.00	.53	1.35	.65	2.45	1.45
HC, PPMC	1025	344	410	171	764	171
NOX, PPM	470	500	320	270	570	480

AIR/FUEL RATIO

	12.83	13.26	13.93	14.01	15.26	15.27
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EMISSION RATES, G/HR

CO	14100.4	10923.2	8228.9	6111.3	4787.4	2358.5
HC	126.3	43.3	44.0	19.0	70.4	15.5
NOX+	177.8	193.5	104.7	91.1	159.9	132.7

OIL TEMPERATURE, F	234	234	234	234	231	231
OIL PRESSURE, PSI	35	35	35	35	36	36
COOLANT TEMPERATURE, F	191	191	192	192	189	189
EXHAUST PRESSURE, IN. H2O	63.0	50.0	58.0	38.0	38.0	25.0
EXHAUST TEMPERATURE, F	892	1224	882	1215	767	1106

\* CORRECTED SAE J816B

+ CORRECTED FOR HUMIDITY

ENGINE: FORD 400 CID

FUEL CODE: 7602

TEST NUMBER

TEST DATE

BAROMETER, MMHG

HUMIDITY, GRAINS/LB

TEMPERATURE, F

ENGINE SPEED, RPM

TORQUE, FT-LB

POWER, BHP\*

FUEL RATE, LB/HR

IGNITION TIMING, DEG 8TDC

MANIFOLD VACUUM, IN HG

THROTTLE ANGLE, DEG

INTAKE MAN. TEMP., F

	27.1	27.2	28.1	28.2	29.1	29.2
	6/15/76	6/15/76	6/15/76	6/15/76	6/11/76	6/11/76
	742.1	742.1	742.1	742.1	737.7	737.7
	60	60	60	60	67	67
	81	81	82	82	84	84
	1600	1600	1600	1600	1600	1600
	137.0	137.0	86.0	86.0	31.2	31.2
	41.8	41.8	26.3	26.3	9.6	9.6
	19.8	20.3	16.4	16.1	11.3	11.2
	50.0	50.0	48.0	48.0	51.0	51.0
	11.0	11.0	14.0	14.0	16.5	16.5
	16.0	16.0	12.0	12.0	7.5	7.5
	188	188	181	181	162	162

CONCENTRATIONS, DRY BASIS

CO, %	.0607	.0378	.0772	.0424	.1420	.0748
CO2, %	11.11	11.00	10.28	10.50	9.31	9.70
O2, %	4.65	4.70	5.95	5.80	7.50	7.12
HC, PPMC	536	112	122	44	3844	2314
NOX, PPM	1025	912	375	355	88	95

AIR/FUEL RATIO

	18.87	19.04	20.44	20.24	21.67	21.46
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EMISSION RATES, G/HR

CO	93.7	60.5	107.3	57.2	145.2	75.0
HC	41.7	9.0	8.5	3.0	198.1	117.0
NOX+	243.0	224.0	80.0	73.5	14.2	15.1

OIL TEMPERATURE, F

OIL PRESSURE, PSI

COOLANT TEMPERATURE, F

EXHAUST PRESSURE, IN. H2O

EXHAUST TEMPERATURE, F

	218	218	212	212	195	195
	40	40	45	45	53	53
	190	190	184	184	178	178
	27.0	15.0	22.0	11.0	13.0	6.0
	702	886	675	854	625	795

\* CORRECTED SAE J816B

+ CORRECTED FOR HUMIDITY



ENGINE: FORD 400 CID

FUEL CODE: 7602

TEST NUMBER

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

THROTTLE ANGLE, DEG

INTAKE MAN. TEMP., F

30.1	30.2	31.1	31.2	32.1	32.2
6/11/76	6/11/76	5/27/76	5/27/76	5/27/76	5/27/76
737.7	737.7	745.4	745.4	745.4	745.4
67	67	63	63	63	63
84	84	77	77	77	77
1600	1600	1800	1800	1800	1800
8.0	8.0	332.0	332.0	299.0	299.0
2.5	2.5	113.3	113.3	102.0	102.0
10.1	9.6	60.1	60.5	52.4	52.3
50.0	50.0	25.0	25.0	25.0	25.0
19.6	19.6	.2	.2	1.8	1.8
6.5	6.5	79.0	79.0	35.5	35.5
154	154	87	87	98	98

CONCENTRATIONS, DRY BASIS

CO, %	.0880	6.7900	6.6800	5.3700	4.0000
CO2, %	8.46	9.89	10.09	10.50	11.66
O2, %	8.75	.08	.07	.90	.36
HC, PPMC	9806	1770	1658	1142	608
NOX, PPM	35	355	330	750	715

AIR/FUEL RATIO

22.16	22.07	11.87	11.94	12.97	13.31
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EMISSION RATES, G/HR

CO	151.6	20175.0	20081.4	15104.3	11456.3
HC	467.4	265.0	251.2	161.8	87.7
NOX+	5.2	164.1	154.3	328.2	318.6
OIL TEMPERATURE, F	189	243	243	248	248
OIL PRESSURE, PSI	55	35	35	35	35
COOLANT TEMPERATURE, F	172	195	195	196	196
EXHAUST PRESSURE, IN. H2O	11.0	94.0	71.0	96.0	70.0
EXHAUST TEMPERATURE, F	584	859	1085	928	1269

\* CORRECTED SAE J816B

+ CORRECTED FOR HUMIDITY

ENGINE: FORD 400 CID  
 FUEL CODE: 7602

	33.1	33.2	34.1	34.2	35.1	35.2
TEST NUMBER	5/27/76	5/27/76	5/27/76	5/27/76	5/27/76	5/27/76
TEST DATE	745.4	745.4	745.4	745.4	745.4	745.4
BAROMETER, MMHG	63	63	63	63	63	63
HUMIDITY, GRAINS/LB	77	77	78	78	79	79
TEMPERATURE, F	1800	1800	1800	1800	1800	1800
ENGINE SPEED, RPM	249.0	249.0	199.0	199.0	133.0	133.0
TORQUE, FT-LB	84.9	84.9	67.9	67.9	45.4	45.4
POWER, BHP*	45.1	45.3	33.7	34.1	22.9	23.5
FUEL RATE, LB/HR	26.0	26.0	40.0	40.0	52.0	52.0
IGNITION TIMING, DEG BTDC	3.2	3.2	6.3	6.3	10.7	10.7
MANIFOLD VACUUM, IN HG	28.0	28.0	20.0	20.0	14.0	14.0
THROTTLE ANGLE, DEG	151	151	195	195	197	197
INTAKE MAN. TEMP., F						

CONCENTRATIONS, DRY BASIS

CO, %	4.6300	2.9600	2.7500	1.2400	.1826	.0892
CO2, %	10.60	12.26	11.33	12.84	11.78	11.63
O2, %	1.32	.50	2.10	1.50	4.04	4.38
HC, PPHC	205	218	1034	503	871	572
NOX, PPM	295	255	515	455	1175	415
AIR/FUEL RATIO	13.59	13.86	14.91	15.29	18.00	18.41

EMISSION RATES, G/HR

CO	11724.7	7623.7	5691.4	2642.2	310.6	158.7
HC	26.2	28.3	107.8	54.0	74.7	51.3
NOX+	116.2	102.2	165.8	150.8	310.9	114.9
OIL TEMPERATURE, F	242	242	239	239	234	234
OIL PRESSURE, PSI	36	36	37	37	40	40
COOLANT TEMPERATURE, F	196	196	195	195	195	195
EXHAUST PRESSURE, IN. H2O	80.0	57.0	52.0	36.0	33.0	21.0
EXHAUST TEMPERATURE, F	916	1298	810	1173	743	954

\* CORRECTED SAE J816B  
 + CORRECTED FOR HUMIDITY



ENGINE: FORD 400 CID

FUEL CODE: 7602

TEST NUMBER

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

THROTTLE ANGLE, DEG

INTAKE MAN. TEMP., F

CONCENTRATIONS, DRY BASIS

CO, %

CO<sub>2</sub>, %

O<sub>2</sub>, %

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. H<sub>2</sub>O

EXHAUST TEMPERATURE, F

\* CORRECTED SAE J8168

+ CORRECTED FOR HUMIDITY

36.1	36.2	37.1	37.2	38.1	38.2
5/27/76	5/27/76	5/28/76	5/28/76	6/10/76	6/10/76
745.4	745.4	745.0	745.0	742.5	742.5
63	63	63	63	64	64
78	78	77	77	84	84
1800	1800	1800	1800	1800	1800
84.0	84.0	34.0	34.0	3.0	3.0
28.7	28.7	11.6	11.6	1.0	1.0
18.2	18.3	13.6	14.0	11.1	11.1
52.0	52.0	49.0	49.0	52.0	52.0
14.0	14.0	17.0	17.0	19.7	19.7
11.0	11.0	9.0	9.0	8.0	8.0
189	189	152	152	160	160

.0940	.0470	.1325	.0772	.1650	.0892
10.74	10.86	9.70	9.89	8.10	8.64
5.65	5.60	7.00	6.75	9.00	8.50
946	490	2205	1380	9229	7091
510	460	160	170	15	41

19.77	19.80	21.28	21.17	22.84	22.51
-------	-------	-------	-------	-------	-------

139.8	70.4	160.3	94.9	177.0	93.4
70.9	37.0	134.4	85.5	499.1	374.1
118.0	107.2	30.1	32.5	2.5	6.7

226	226	217	217	210	210
43	43	46	46	50	50
193	193	189	189	188	188
22.0	15.0	16.0	11.0	13.0	8.0
703	905	629	648	602	815

ENGINE: FORD 400 CID

FUEL CODE: 7602

TEST NUMBER

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

THROTTLE ANGLE, DEG

INTAKE MAN. TEMP., F

39.2	40.1	40.2	41.1	41.2
5/28/76	5/28/76	5/28/76	5/28/76	5/28/76
745.0	745.0	745.0	745.0	745.0
63	63	63	63	63
77	77	77	81	81
2200	2200	2200	2200	2200
322.0	287.0	287.0	242.0	242.0
134.3	119.8	119.8	101.3	101.3
72.1	65.5	65.6	56.1	55.6
23.5	26.0	26.0	27.0	27.0
1.0	2.0	2.0	3.2	3.2
79.0	39.5	39.5	31.5	31.5
88	105	105	153	153

CONCENTRATIONS, DRY BASIS

6.2900	6.5100	6.0200	5.3700	3.9000
10.19	9.79	10.40	10.50	11.66
.07	.50	.27	.80	.27
1474	1453	1052	982	459
435	550	500	235	250

AIR/FUEL RATIO

12.09	12.21	12.36	12.90	13.28
-------	-------	-------	-------	-------

EMISSION RATES, G/HR

22726.1	21685.5	20220.1	16106.9	11852.1
268.5	243.9	170.2	148.4	70.2
244.6	285.1	261.4	109.7	118.2

OIL TEMPERATURE, F

OIL PRESSURE, PSI

COOLANT TEMPERATURE, F

EXHAUST PRESSURE, IN. H2O

EXHAUST TEMPERATURE, F

254	251	251	253	253
39	39	39	40	40
183	191	191	189	189
133.0	124.0	96.0	110.0	84.0
914	936	1232	977	1321

\* CORRECTED SAE J8168

+ CORRECTED FOR HUMIDITY

ENGINE: FORD 400 CID

FUEL CODE: 7602

TEST NUMBER

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

THROTTLE ANGLE, DEG

INTAKE MAN. TEMP., F

42.1  
5/28/76  
745.0  
63  
81  
2200  
193.0  
80.8  
45.1  
39.0  
5.5  
24.0  
205

42.2  
5/28/76  
745.0  
63  
81  
2200  
193.0  
80.8  
45.5  
39.0  
5.5  
24.0  
205

43.1  
6/10/76  
742.5  
64  
82  
2200  
130.0  
54.7  
26.9  
52.0  
11.0  
20.0  
205

43.2  
6/10/76  
742.5  
64  
82  
2200  
130.0  
54.7  
26.6  
52.0  
11.0  
20.0  
205

44.1  
5/28/76  
745.0  
63  
79  
2200  
80.0  
33.4  
22.4  
50.0  
14.0  
13.0  
207

44.2  
5/28/76  
745.0  
63  
79  
2200  
80.0  
33.4  
22.5  
50.0  
14.0  
13.0  
207

CONCENTRATIONS, DRY BASIS

CO, %  
CO2, %  
O2, %  
HC, PPMC  
NOX, PPM

5.0000  
10.09  
1.55  
783  
195

.7570  
11.66  
3.00  
620  
950

.2416  
11.66  
3.50  
360  
900

.1650  
11.01  
5.00  
726  
510

.0820  
10.90  
5.25  
390  
525

AIR/FUEL RATIO

13.48

13.72

16.79

17.61

19.06

19.46

EMISSION RATES, G/HR

CO  
HC  
NOX+

12614.4  
99.6  
76.6

1408.3  
58.1  
277.0

467.2  
35.0  
272.7

291.3  
64.6  
140.1

148.3  
35.6  
147.8

OIL TEMPERATURE, F

OIL PRESSURE, PSI

COOLANT TEMPERATURE, F

EXHAUST PRESSURE, IN. H2O

EXHAUST TEMPERATURE, F

252  
41  
195  
83.0  
896

252  
41  
195  
59.0  
1101

227  
45  
187  
38.0  
790

227  
45  
187  
25.0  
1020

212  
55  
191  
27.0  
661

212  
55  
191  
20.0  
882

\* CORRECTED SAE J816B  
+ CORRECTED FOR HUMIDITY

ENGINE: FORD 400 CID

FUEL CODE: 7602

TEST NUMBER

45.1

5/28/76

745.0

63

80

2200

33.0

13.8

16.3

48.0

17.0

10.0

210

45.2

5/28/76

745.0

63

80

2200

33.0

13.8

16.2

48.0

17.0

10.0

210

46.1

6/10/76

742.5

64

87

2200

1.5

.6

13.8

53.0

19.5

9.5

178

46.2

6/10/76

742.5

64

87

2200

1.5

.6

13.7

53.0

19.5

9.5

178

47.1

5/28/76

745.0

63

87

2600

307.0

152.7

80.8

28.0

1.7

79.0

89

47.2

5/28/76

745.0

63

87

2600

307.0

152.7

81.3

28.0

1.7

79.0

89

CONCENTRATIONS, DRY BASIS

CO, % .1511

CO2, % 9.99

O2, % 6.60

HC, PPMC 1382

NOX, PPM 200

5.6700

10.60

.08

1545

580

5.8000

10.60

.07

1362

480

AIR/FUEL RATIO

20.87

20.88

21.44

21.62

12.35

12.32

EMISSION RATES, G/HR

CO 213.3

HC 98.3

NOX+ 43.9

23453.7

322.1

373.3

24068.4

285.0

310.0

OIL TEMPERATURE, F 232

OIL PRESSURE, PSI 50

COOLANT TEMPERATURE, F 187

EXHAUST PRESSURE, IN. H2O 22.0

EXHAUST TEMPERATURE, F 742

257

44

189

182.0

1002

257

44

189

154.0

1235

\* CORRECTED SAE J8168

+ CORRECTED FOR HUMIDITY



ENGINE: FORD 400 CID  
 FUEL CODE: 7602

TEST NUMBER	48.2	49.1	49.2	50.1	50.2
TEST DATE	5/28/76	5/28/76	5/28/76	5/28/76	5/28/76
BAROMETER, MMHG	745.0	745.0	745.0	745.0	745.0
HUMIDITY, GRAINS/LB	63	63	63	63	63
TEMPERATURE, F	82	82	82	82	82
ENGINE SPEED, RPM	2600	2600	2600	2600	2600
TORQUE, FT-LB	276.7	230.0	230.0	184.0	184.0
POWER, BHP*	137.0	113.9	113.9	91.1	91.1
FUEL RATE, LB/HR	76.7	66.9	67.2	55.7	55.5
IGNITION TIMING, DEG BTDC	32.5	30.5	30.5	42.0	42.0
MANIFOLD VACUUM, IN HG	3.7	3.0	3.0	5.6	5.6
THROTTLE ANGLE, DEG	35.5	35.0	35.0	26.0	26.0
INTAKE MAN. TEMP., F	84	151	151	202	202

CONCENTRATIONS, DRY BASIS

CO, %	7.0400	6.4300	5.5900	6.2100	4.7800
CO2, %	9.70	9.80	10.70	9.50	10.90
O2, %	.10	.55	.25	1.15	.45
HC, PPMC	1654	1367	973	1418	829
NOX, PPM	490	180	220	135	130

AIR/FUEL RATIO

AIR/FUEL RATIO	11.79	12.26	12.53	12.64	12.96
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EMISSION RATES, G/HR

CO	26559.9	21962.6	19481.9	18244.9	14217.7
HC	314.5	235.3	171.0	210.0	124.2
NOX+	287.7	95.7	119.3	61.7	60.2

OIL TEMPERATURE, F	255	247	247	246	246
OIL PRESSURE, PSI	43	45	45	45	45
COOLANT TEMPERATURE, F	192	191	191	195	195
EXHAUST PRESSURE, IN. H2O	149.0	138.0	109.0	108.0	80.0
EXHAUST TEMPERATURE, F	974	1006	1306	949	1312

\* CORRECTED SAE J8168  
 + CORRECTED FOR HUMIDITY



ENGINE: FORD 400 CID

FUEL CODE: 7602

TEST NUMBER

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

THROTTLE ANGLE, DEG

INTAKE MAN. TEMP., F

	51.1	51.2	52.1	52.2	53.1	53.2
	5/28/76	5/28/76	5/28/76	5/28/76	5/28/76	5/28/76
	745.0	745.0	745.0	745.0	745.0	745.0
	63	63	63	63	63	63
	82	82	82	82	82	82
	2600	2600	2600	2600	2600	2600
	123.8	123.8	77.0	77.0	31.0	31.0
	61.3	61.3	38.1	38.1	15.4	15.4
	38.7	38.4	27.9	27.6	20.5	20.4
	55.0	55.0	56.0	56.0	56.0	56.0
	10.6	10.6	14.2	14.2	17.7	17.7
	19.0	19.0	15.0	15.0	11.0	11.0
	205	205	215	215	218	218

CONCENTRATIONS, DRY BASIS

CO, %	3.0700	1.4800	.5754	.3756	.4400	.2789
CO2, %	11.33	12.88	12.13	11.78	11.01	11.01
O2, %	1.55	1.05	2.75	3.45	4.75	4.78
HC, PPMC	774	235	187	146	201	151
NOX, PPM	265	240	330	315	110	115

AIR/FUEL RATIO

	14.40	14.89	16.69	17.44	18.65	18.84
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EMISSION RATES, G/HR

CO	7051.1	3457.0	1101.8	744.1	697.1	442.3
HC	89.6	27.6	18.0	14.6	16.1	12.1
NOX+	94.7	87.2	98.3	97.1	27.1	28.4

OIL TEMPERATURE, F

OIL PRESSURE, PSI

COOLANT TEMPERATURE, F

EXHAUST PRESSURE, IN. H2O

EXHAUST TEMPERATURE, F

	244	244	245	245	237	237
	50	50	53	53	52	52
	191	191	192	192	189	189
	72.0	48.0	47.0	30.0	27.0	18.0
	914	1284	894	1132	857	1064

\* CORRECTED SAE J816B

+ CORRECTED FOR HUMIDITY

ENGINE: FORD 400 CID

FUEL CODE: 7602

TEST NUMBER

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

THROTTLE ANGLE, DEG

INTAKE MAN. TEMP., F

54.1	54.2	55.1	55.2	56.1	56.2
5/28/76	5/28/76	5/28/76	5/28/76	5/28/76	5/28/76
745.0	745.0	745.0	745.0	745.0	745.0
63	63	63	63	63	63
83	83	84	84	83	83
2600	2600	3000	3000	3000	3000
8.0	8.0	285.0	285.0	257.0	257.0
4.0	4.0	163.1	163.1	147.0	147.0
17.3	16.8	88.8	90.4	86.6	87.0
56.0	56.0	31.0	31.0	36.0	36.0
19.8	19.8	2.0	2.0	3.9	3.9
9.0	9.0	79.0	79.0	38.8	38.8
218	218	87	87	79	79

CONCENTRATIONS, DRY BASIS

CO, %	.4180
CO2, %	11.00
O2, %	5.00
HC, PPMC	145
NOX, PPM	58

5.8600	6.9500	7.1500
10.60	9.70	9.70
.10	.09	.07
1517	1711	1484
605	530	510
12.31	11.80	11.75

AIR/FUEL RATIO

18.90	19.27	12.37
-------	-------	-------

11.80	11.80
-------	-------

EMISSION RATES, G/HR

CO	565.0
HC	9.9
NOX+	12.2

26516.3	29642.7	30500.2
346.1	367.7	319.0
426.0	351.8	338.5

OIL TEMPERATURE, F

OIL PRESSURE, PSI

COOLANT TEMPERATURE, F

EXHAUST PRESSURE, IN. H2O

EXHAUST TEMPERATURE, F

234	268	266
60	46	45
189	194	190
13.0	218.0	188.0
1041	1061	1008
234	268	266
60	46	45
189	194	190
13.0	218.0	188.0
1041	1061	1008
268	266	266
46	45	45
194	190	190
194.0	188.0	160.0
1287	1008	1227

\* CORRECTED SAE J816B

+ CORRECTED FOR HUMIDITY

ENGINE: FORD 400 CID

FUEL CODE: 7602

TEST NUMBER

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

THROTTLE ANGLE, DEG

INTAKE MAN. TEMP., F

57.1	57.2	58.1	58.2	59.1	59.2
5/29/76	5/29/76	6/10/76	6/10/76	5/29/76	5/29/76
736.7	736.7	742.5	742.5	736.7	736.7
59	59	64	64	59	59
81	81	87	87	82	82
3000	3000	3000	3000	3000	3000
215.0	215.0	173.0	173.0	114.0	114.0
124.0	124.0	99.7	99.7	65.8	65.8
79.3	79.7	64.2	64.1	45.8	47.0
47.5	47.5	45.5	45.5	57.0	57.0
6.5	6.5	5.8	5.8	10.0	10.0
31.5	31.5	38.0	38.0	21.0	21.0
76	76	202	202	223	223

CONCENTRATIONS, DRY BASIS

7.7400	7.6600	6.6000	5.7900	3.8200	2.7200
9.11	9.31	10.09	11.11	11.33	12.26
.13	.07	.75	.25	.88	.50
1706	1538	1229	748	725	344
375	380	140	170	210	190

AIR/FUEL RATIO

11.48	11.52	12.39	12.55	13.64	13.94
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EMISSION RATES, G/HR

29529.6	29439.3	21764.2	19178.6	9832.9	7316.1
328.0	297.9	204.2	124.8	94.1	46.6
219.1	223.6	72.3	88.2	82.8	78.3

OIL TEMPERATURE, F

OIL PRESSURE, PSI

COOLANT TEMPERATURE, F

EXHAUST PRESSURE, IN. H2O

EXHAUST TEMPERATURE, F

265	265	247	247	258	258
46	46	47	47	51	51
192	192	198	198	192	192
146.0	118.0	127.0	98.0	94.0	67.0
932	1157	997	1325	1037	1384

\* CORRECTED SAE J8168

+ CORRECTED FOR HUMIDITY

ENGINE: FORD 400 CID  
 FUEL CODE: 7602

TEST NUMBER	60.1	60.2	61.1	61.2	62.1	62.2
TEST DATE	5/29/76	5/29/76	5/29/76	5/29/76	5/29/76	5/29/76
BAROMETER, MMHG	736.7	736.7	736.7	736.7	736.7	736.7
HUMIDITY, GRAINS/LB	59	59	59	59	59	59
TEMPERATURE, F	82	82	82	82	82	82
ENGINE SPEED, RPM	3000	3000	3000	3000	3000	3000
TORQUE, FT-LB	71.0	71.0	28.4	28.4	4.8	4.8
POWER, BHP*	41.0	41.0	16.4	16.4	2.8	2.8
FUEL RATE, LB/HR	32.9	33.0	24.6	24.6	22.7	23.3
IGNITION TIMING, DEG BTDC	58.0	58.0	58.0	58.0	58.0	58.0
MANIFOLD VACUUM, IN HG	14.0	14.0	17.2	17.2	19.0	19.0
THROTTLE ANGLE, DEG	16.5	16.5	12.5	12.5	10.0	10.0
INTAKE MAN. TEMP., F	222	222	225	225	235	235

CONCENTRATIONS, DRY BASIS

CO, %	.8344	.4362	.3779	.2789	.9125	.3985
CO2, %	12.62	12.50	11.44	11.55	12.02	12.75
O2, %	1.90	2.55	4.20	4.15	2.85	2.90
HC, PPMC	80	68	101	73	147	45
NOX, PPM	240	250	115	112	60	62

AIR/FUEL RATIO

	15.85	16.59	18.13	18.15	16.55	16.83
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EMISSION RATES, G/HR

CO	1784.7	980.4	694.8	513.6	1409.5	639.4
HC	8.6	7.7	9.4	6.8	11.5	3.7
NOX+	78.6	86.0	32.4	31.6	14.2	15.2

OIL TEMPERATURE, F	252	252	237	237	239	239
OIL PRESSURE, PSI	55	55	59	59	60	60
COOLANT TEMPERATURE, F	192	192	191	191	192	192
EXHAUST PRESSURE, IN. H2O	58.0	42.0	38.0	35.0	33.0	20.0
EXHAUST TEMPERATURE, F	992	1266	907	1143	1024	1308

\* CORRECTED SAE J8168  
 + CORRECTED FOR HUMIDITY



ENGINE: FORD 400 CID

FUEL CODE: 7602

TEST NUMBER

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

THROTTLE ANGLE, DEG

INTAKE MAN. TEMP., F

63.1	64.1	64.2	65.1	65.2
5/29/76	6/10/76	6/10/76	5/29/76	5/29/76
736.7	742.5	742.5	736.7	736.7
59	64	64	59	59
84	87	87	86	86
3500	3500	3500	3500	3500
250.0	227.0	227.0	188.0	188.0
168.7	152.6	152.6	127.1	127.1
98.6	96.3	95.5	90.4	91.5
34.0	42.0	42.0	51.5	51.5
2.4	4.4	4.4	6.2	6.2
79.0	54.0	54.0	37.0	37.0
85	82	82	83	83

CONCENTRATIONS, DRY BASIS

CO, %

CO2, %

O2, %

HC, PPMC

NOX, PPM

5.5400	7.8500	7.8800	8.7400	8.5200
10.60	9.89	9.89	8.74	8.74
.11	.10	.08	.10	.07
1544	1691	1376	1819	1591
630	500	520	320	315
12.41	11.61	11.61	11.11	11.16

AIR/FUEL RATIO

EMISSION RATES, G/HR

CO

HC

NOX+

28089.1	36463.6	36308.0	36911.6	36586.8
394.5	395.9	319.6	387.2	344.3
489.1	364.0	375.5	206.9	207.1
285	252	252	279	279
46	47	47	47	47
195	197	197	193	193
252.0	218.0	194.0	185.0	157.0
1106	1049	1254	989	1207

OIL TEMPERATURE, F

OIL PRESSURE, PSI

COOLANT TEMPERATURE, F

EXHAUST PRESSURE, IN. H2O

EXHAUST TEMPERATURE, F

\* CORRECTED SAE J8168

+ CORRECTED FOR HUMIDITY



ENGINE: FORD 400 CID  
 FUEL CODE: 7602

TEST NUMBER	66.1	66.2	67.1	67.2	68.1	68.2
TEST DATE	6/10/76	6/10/76	5/29/76	5/29/76	5/29/76	5/29/76
BAROMETER, MMHG	742.5	742.5	736.7	736.7	736.7	736.7
HUMIDITY, GRAINS/LB	64	64	59	59	59	59
TEMPERATURE, F	88	88	84	84	100	100
ENGINE SPEED, RPM	3500	3500	3500	3500	3500	3500
TORQUE, FT-LB	152.0	152.0	101.0	101.0	62.0	62.0
POWER, BHP*	102.3	102.3	68.2	68.2	42.4	42.4
FUEL RATE, LB/HR	76.4	73.4	54.7	54.7	41.7	41.4
IGNITION TIMING, DEG BTDC	59.0	59.0	60.0	60.0	61.0	61.0
MANIFOLD VACUUM, IN HG	9.6	9.6	10.0	10.0	13.5	13.5
THROTTLE ANGLE, DEG	38.2	38.2	24.0	24.0	23.5	23.5
INTAKE MAN. TEMP., F	86	86	205	205	239	239

CONCENTRATIONS, DRY BASIS

CO, %	8.4500	8.4700	4.2400	3.4200	2.4800	.9810
CO2, %	9.50	9.40	11.11	12.02	12.13	13.53
O2, %	.15	.10	.65	.30	1.00	.25
HC, PPMC	1431	1372	657	425	371	57
NOX, PPM	420	385	195	185	130	128

AIR/FUEL RATIO

	11.42	11.36	13.32	13.52	14.36	14.60
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EMISSION RATES, G/HR

CO	30698.2	29477.8	12756.7	10385.1	6094.7	2422.4
HC	262.0	240.7	99.6	65.0	46.0	7.1
NOX+	239.1	210.0	89.8	86.0	48.9	48.4

OIL TEMPERATURE, F	236	236	262	262	247	247
OIL PRESSURE, PSI	52	52	53	53	57	57
COOLANT TEMPERATURE, F	191	191	193	193	192	192
EXHAUST PRESSURE, IN. H2O	135.0	106.0	113.0	84.0	83.0	57.0
EXHAUST TEMPERATURE, F	951	1179	1067	1404	1092	1508

\* CORRECTED SAE J8168  
 + CORRECTED FOR HUMIDITY

ENGINE: FORD 400 CID

FUEL CODE: 7602

TEST NUMBER

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

THROTTLE ANGLE, DEG

INTAKE MAN. TEMP., F

69.1	69.2	70.1	70.2	71.1	71.2
5/29/76	5/29/76	6/10/76	6/10/76	6/11/76	6/11/76
736.7	736.7	742.5	742.5	745.3	745.3
59	59	64	64	64	64
82	82	88	88	81	81
3500	3500	3500	3500	650	650
26.0	26.0	8.0	8.0	.3	.3
17.5	17.5	5.4	5.4	.0	.0
32.4	29.6	31.0	30.6	3.8	3.5
61.0	61.0	58.0	58.0	37.0	377.0
16.5	16.5	17.5	17.5	20.5	20.5
18.0	18.0	17.0	17.0	.0	.0
243	243	212	212	135	135

CONCENTRATIONS, DRY BASIS

CO, %	1.0900
CO2, %	12.26
O2, %	2.20
HC, PPMC	284
NOX, PPM	90

1.7000	2.0830	.9488
12.13	11.78	12.38
1.60	2.20	2.50
1138	19894	14765
50	17	12

AIR/FUEL RATIO

15.92	15.06	15.21	14.62
-------	-------	-------	-------

EMISSION RATES, G/HR

CO	2305.1
HC	30.3
NOX+	29.1

1014.7	443.9	201.3
5.6	213.7	157.9
30.2	.6	.4

OIL TEMPERATURE, F

OIL PRESSURE, PSI

COOLANT TEMPERATURE, F

EXHAUST PRESSURE, IN. H2O

EXHAUST TEMPERATURE, F

247	172	172
58	30	30
190	175	175
37.0	5.0	1.0
1427	374	434

\* CORRECTED SAE J816B  
 + CORRECTED FOR HUMIDITY

ENGINE: FORD 400 CID

FUEL CODE: 7602

TEST NUMBER

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

THROTTLE ANGLE, DEG

INTAKE MAN. TEMP., F

72.1  
6/ 1/76  
745.0  
64  
84  
650  
10.0  
1.2  
4.1  
37.0  
19.5  
.5  
142

72.2  
6/ 1/76  
745.0  
64  
84  
650  
10.0  
1.2  
4.1  
37.0  
19.5  
.5  
142

73.1  
6/ 3/76  
744.0  
64  
84  
650  
20.0  
2.5  
4.3  
39.0  
19.5  
.5  
118

73.2  
6/ 3/76  
744.0  
64  
84  
650  
20.0  
2.5  
4.1  
39.0  
19.5  
.5  
118

74.1  
6/ 3/76  
744.0  
64  
84  
750  
1.4  
.2  
4.2  
39.5  
20.5  
.0  
121

74.2  
6/ 3/76  
744.0  
64  
84  
750  
1.4  
.2  
4.2  
39.5  
20.5  
.0  
121

CONCENTRATIONS, DRY BASIS

CO, % .3390  
CO2, % 12.25  
O2, % 15.00  
HC, PPMC 16955  
NOX, PPM 55

.6276  
12.75  
1.75  
9100  
80

.1741  
12.75  
2.05  
6239  
40

.5926  
11.78  
3.45  
19725  
35

.1811  
12.26  
3.05  
11294  
25

AIR/FUEL RATIO

23.22

16.75

14.84

15.59

14.91

15.75

EMISSION RATES, G/HR

CO 131.2  
HC 330.7  
NOX+ 3.3

34.7  
121.2  
2.6

163.3  
119.3  
3.3

46.3  
83.5  
1.7

153.8  
258.1  
1.4

49.9  
157.0  
1.1

OIL TEMPERATURE, F 189  
OIL PRESSURE, PSI 26  
COOLANT TEMPERATURE, F 186  
EXHAUST PRESSURE, IN. H2O 5.0  
EXHAUST TEMPERATURE, F 407

185  
27  
187  
.0  
503

185  
27  
187  
2.0  
422

189  
26  
186  
3.0  
527

189  
29  
182  
2.0  
412

189  
29  
182  
2.0  
527

\* CORRECTED SAE J816B  
+ CORRECTED FOR HUMIDITY

ENGINE: FORD 400 CID

FUEL CODE: 7602

TEST NUMBER

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

THROTTLE ANGLE, DEG

INTAKE MAN. TEMP., F

75.1	75.2	76.1	76.2	77.1	77.2
6/ 3/76	6/ 3/76	6/ 3/76	6/ 3/76	6/ 3/76	6/ 3/76
744.0	744.0	744.0	744.0	744.0	744.0
64	64	64	64	64	64
84	84	88	88	82	82
750	750	750	750	850	850
10.0	10.0	20.0	20.0	308.0	308.0
1.4	1.4	2.9	2.9	49.9	49.9
4.5	4.5	4.8	4.8	24.8	24.5
40.0	40.0	40.0	40.0	15.0	15.0
20.2	20.2	19.5	19.5	.0	.0
.5	.5	1.0	1.0	79.0	79.0
121	121	123	123	94	94

CONCENTRATIONS, DRY BASIS

CO, %	.4400
CO2, %	12.13
O2, %	3.10
HC, PPMC	16947
NOX, PPM	55
AIR/FUEL RATIO	15.04

.1263	.2533	.0844	4.5800	3.8200
12.26	12.26	12.50	11.44	11.78
3.25	2.85	2.90	.20	.35
10161	11299	5090	1894	1721
45	100	95	1100	1225
16.06	15.57	16.43	12.89	13.30

EMISSION RATES, G/HR

CO	123.3	78.3	27.4	6019.2	5115.3
HC	239.4	176.1	83.2	125.4	116.1
NOX+	2.4	4.8	4.8	226.4	256.9
OIL TEMPERATURE, F	191	191	191	208	208
OIL PRESSURE, PSI	29	29	29	25	25
COOLANT TEMPERATURE, F	182	188	188	201	201
EXHAUST PRESSURE, IN. H2O	5.0	5.0	.0	22.0	13.0
EXHAUST TEMPERATURE, F	425	434	542	722	834

37.7	78.3	27.4	6019.2	5115.3
152.8	176.1	83.2	125.4	116.1
2.1	4.8	4.8	226.4	256.9
191	191	191	208	208
29	29	29	25	25
182	188	188	201	201
.0	5.0	.0	22.0	13.0
539	434	542	722	834

\* CORRECTED SAE J8168

+ CORRECTED FOR HUMIDITY



ENGINE: FORD 400 CID

FUEL CODE: 7602

TEST NUMBER

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

THROTTLE ANGLE, DEG

INTAKE MAN. TEMP., F

78.1	78.2	79.1	79.2	80.1	80.2
6/ 3/76	6/ 3/76	6/ 3/76	6/ 3/76	6/ 3/76	6/ 3/76
744.0	744.0	744.0	744.0	744.0	744.0
64	64	64	64	64	64
84	84	85	85	83	83
850	850	850	850	850	850
234.0	234.0	123.0	123.0	77.0	77.0
38.0	38.0	20.0	20.0	12.5	12.5
17.8	18.1	10.1	9.9	7.6	7.9
14.5	14.5	42.5	42.5	43.0	43.0
2.5	2.5	12.0	12.0	16.5	16.5
22.0	22.0	7.0	7.0	4.0	4.0
157	157	149	149	125	125

CONCENTRATIONS, DRY BASIS

CO, %	1.3300	.0561	.0378	.0748	.0700
CO2, %	12.02	11.01	11.11	10.60	10.70
O2, %	2.18	5.00	4.85	5.90	5.70
HC, PPMC	1191	1127	720	1111	723
NOX, PPM	450	1000	855	475	450
AIR/FUEL RATIO	15.69	19.11	19.03	20.05	19.90

EMISSION RATES, G/HR

CO	1524.0	891.1	44.7	47.4	45.6
HC	68.8	43.6	45.2	28.4	23.8
NOX+	80.7	73.2	124.8	104.7	45.9
OIL TEMPERATURE, F	206	206	201	199	199
OIL PRESSURE, PSI	36	36	27	27	29
COOLANT TEMPERATURE, F	186	186	186	186	186
EXHAUST PRESSURE, IN. H2O	19.0	10.0	8.0	4.0	2.0
EXHAUST TEMPERATURE, F	736	924	569	682	589

\* CORRECTED SAE J816B

+ CORRECTED FOR HUMIDITY



ENGINE: FORD 400 CID

FUEL CODE: 7602

TEST NUMBER

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

THROTTLE ANGLE, DEG

INTAKE MAN. TEMP., F

81.1	81.2	82.1	82.2	84.1	84.2
6/ 3/76	6/ 3/76	6/14/76	6/14/76	6/14/76	6/14/76
744.0	744.0	737.7	737.7	737.7	737.7
64	64	67	67	67	67
83	83	87	87	84	84
850	850	1000	1000	1000	1000
33.0	33.0	292.0	292.0	117.0	117.0
5.4	5.4	56.5	56.5	22.6	22.6
6.0	6.0	26.8	26.5	9.8	9.8
42.0	42.0	17.0	17.0	45.0	45.0
19.5	19.5	.0	.0	16.0	16.0
2.0	2.0	79.0	79.0	5.5	5.5
121	121	111	111	137	137

CONCENTRATIONS, DRY BASIS

CO, %

CO2, %

O2, %

HC, PPMC

NOX, PPM

1721	3.3000	2.7200	.2890	1603
13.01	12.87	13.26	10.90	11.11
2.50	.11	.11	5.12	5.12
8529	1156	1070	1172	670
210	1250	1375	410	475

AIR/FUEL RATIO

15.65	16.29	13.49	13.74	19.01	19.14
-------	-------	-------	-------	-------	-------

EMISSION RATES, G/HR

CO

HC

NOX+

66.4	4859.2	4030.4	221.6	124.5
165.8	85.8	79.9	45.3	26.2
12.7	291.4	322.5	49.8	58.4

OIL TEMPERATURE, F

OIL PRESSURE, PSI

COOLANT TEMPERATURE, F

EXHAUST PRESSURE, IN. H2O

EXHAUST TEMPERATURE, F

196	225	225	190	190
30	25	25	35	35
186	190	190	178	178
5.0	24.0	16.0	8.0	3.0
478	745	870	553	642

\* CORRECTED SAE J816B  
 + CORRECTED FOR HUMIDITY

ENGINE: FORD 400 CID

FUEL CODE: 7602

TEST NUMBER

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

THROTTLE ANGLE, DEG

INTAKE MAN. TEMP., F

85.1	85.2	86.1	86.2	87.1	87.2
6/14/76	6/14/76	6/14/76	6/14/76	6/11/76	6/11/76
737.7	737.7	737.7	737.7	740.7	740.7
67	67	67	67	71	71
84	84	83	83	86	86
1000	1000	1000	1000	1600	1600
74.0	74.0	29.0	29.0	327.0	330.0
14.3	14.3	5.6	5.6	100.8	101.7
8.2	8.4	6.3	6.5	52.6	52.7
44.5	44.5	44.5	44.5	23.0	23.0
17.5	17.5	20.0	20.0	.0	.0
4.0	4.0	3.0	3.0	79.0	79.0
129	129	121	121	92	92

CONCENTRATIONS, DRY BASIS

CO, %

CO2, %

O2, %

HC, PPMC

NOX, PPM

.1084	.0561	.1132	.0538	6.6400	6.7700
9.89	10.35	9.11	9.60	10.09	9.99
7.00	6.37	8.00	7.50	.05	.05
3312	998	10412	4293	1429	1429
190	215	100	120	325	320

AIR/FUEL RATIO

20.97	20.65	20.92	21.49	11.96	11.90
-------	-------	-------	-------	-------	-------

EMISSION RATES, G/HR

CO

HC

NOX+

77.2	40.2	62.9	31.2	17362.4	17667.1
119.0	36.0	291.8	125.6	188.4	187.9
21.4	24.4	8.8	11.0	137.1	134.8

OIL TEMPERATURE, F

OIL PRESSURE, PSI

COOLANT TEMPERATURE, F

EXHAUST PRESSURE, IN. H2O

EXHAUST TEMPERATURE, F

185	185	184	184	230	230
37	37	40	40	32	32
174	174	172	172	192	192
5.0	2.0	5.0	2.0	72.0	50.0
527	618	472	613	882	1050

\* CORRECTED SAE J8168

+ CORRECTED FOR HUMIDITY

ENGINE: FORD 400 CID  
 FUEL CODE: 7602

	88.1	88.2	89.1	89.2	90.1	90.2
TEST NUMBER	6/11/76	6/11/76	6/11/76	6/11/76	6/11/76	6/11/76
TEST DATE	740.7	740.7	740.7	740.7	740.7	740.7
BAROMETER, MMHG	71	71	71	71	71	71
HUMIDITY, GRAINS/LB	88	88	87	87	87	87
TEMPERATURE, F	1600	1600	1600	1600	1600	1600
ENGINE SPEED, RPM	248.0	248.0	132.0	132.0	83.0	83.0
TORQUE, FT-LB	76.6	76.6	40.7	40.7	25.6	25.6
POWER, BHP*	38.9	38.9	20.9	20.5	16.6	16.6
FUEL RATE, LB/HR	24.0	24.0	50.0	50.0	47.0	47.0
IGNITION TIMING, DEG BTDC	3.0	3.0	11.0	11.0	14.0	14.0
MANIFOLD VACUUM, IN HG	34.0	34.0	16.0	16.0	12.0	12.0
THROTTLE ANGLE, DEG	156	156	191	191	184	184
INTAKE MAN. TEMP., F						

CONCENTRATIONS, DRY BASIS

CO, %	4.6800	3.3800	.1560	.0675	.0988	.0493
CO2, %	10.50	11.78	11.66	11.55	10.69	10.90
O2, %	1.25	.50	3.65	3.95	5.00	4.95
HC, PPMC	967	458	730	392	779	334
NOX, PPM	210	215	960	890	370	360

AIR/FUEL RATIO

	13.44	13.63	17.74	18.14	19.23	19.23
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EMISSION RATES, G/HR

CO	10129.7	7372.3	238.2	103.7	130.8	65.1
HC	105.5	50.3	56.2	30.4	51.9	22.2
NOX+	73.4	75.7	236.6	220.8	79.0	76.7

OIL TEMPERATURE, F	224	224	214	214	206	206
OIL PRESSURE, PSI	35	35	40	40	45	45
COOLANT TEMPERATURE, F	191	191	186	186	185	185
EXHAUST PRESSURE, IN. H2O	60.0	40.0	27.0	16.0	19.0	11.0
EXHAUST TEMPERATURE, F	885	1231	742	906	696	855

\* CORRECTED SAE J816B  
 + CORRECTED FOR HUMIDITY

ENGINE: FORD 400 CID

FUEL CODE: 7602

TEST NUMBER

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

THROTTLE ANGLE, DEG

INTAKE MAN. TEMP., F

91.1

6/14/76

737.7

67

81

1600

33.0

10.2

11.9

52.0

18.0

8.0

153

92.1

6/16/76

741.1

61

85

1800

335.0

115.7

58.5

25.0

.5

79.0

92

93.1

6/14/76

737.7

67

88

1800

249.0

86.8

44.4

26.0

3.0

36.0

168

92.2

6/16/76

741.1

61

85

1800

335.0

115.7

58.6

25.0

.5

79.0

92

93.2

6/14/76

737.7

67

88

1800

249.0

86.8

44.4

26.0

3.0

36.0

168

CONCENTRATIONS, DRY BASIS

CO, %

CO2, %

O2, %

HC, PPMC

NOX, PPM

.1373

9.79

7.00

2758

100

7.5200

10.29

.07

1724

400

4.7800

10.39

1.20

1058

250

3.3000

12.01

.40

470

245

AIR/FUEL RATIO

21.10

20.89

11.75

12.02

13.35

13.62

EMISSION RATES, G/HR

CO

HC

NOX+

143.3

145.1

16.5

77.3

69.0

17.5

21413.6

247.5

176.3

19126.4

253.2

181.0

11754.5

131.1

97.3

8202.1

58.9

96.4

OIL TEMPERATURE, F

OIL PRESSURE, PSI

COOLANT TEMPERATURE, F

EXHAUST PRESSURE, IN. H2O

EXHAUST TEMPERATURE, F

192

50

187

13.0

646

192

50

187

7.0

814

245

35

194

88.0

888

245

35

194

64.0

1080

231

36

196

72.0

906

231

36

196

49.0

1270

\* CORRECTED SAE J8168

+ CORRECTED FOR HUMIDITY



ENGINE: FORD 400 CID

FUEL CODE: 7602

TEST NUMBER

TEST DATE

BAROMETER, MMHG

HUMIDITY, GRAINS/LB

TEMPERATURE, F

ENGINE SPEED, RPM

TORQUE, FT-LB

POWER, BHP\*

FUEL RATE, LB/HR

IGNITION TIMING, DEG 8TDC

MANIFOLD VACUUM, IN HG

THROTTLE ANGLE, DEG

INTAKE MAN. TEMP., F

94.1  
6/14/76  
737.7  
67  
88  
1800  
133.0  
46.3  
23.1  
49.0  
11.0  
17.0  
204

94.2  
6/14/76  
737.7  
67  
88  
1800  
133.0  
46.3  
22.2  
49.0  
11.0  
17.0  
204

95.1  
6/14/76  
737.7  
67  
86  
1800  
84.0  
29.2  
17.6  
52.0  
14.5  
13.0  
186

95.2  
6/14/76  
737.7  
67  
86  
1800  
84.0  
29.2  
18.0  
52.0  
14.5  
13.0  
186

96.1  
6/4/76  
745.8  
59  
82  
1800  
33.0  
11.3  
13.3  
51.0  
17.7  
10.0  
178

96.2  
6/4/76  
745.8  
59  
82  
1800  
33.0  
11.3  
13.4  
51.0  
17.7  
10.0  
178

CONCENTRATIONS, DRY BASIS

CO, % .2011  
CO2, % 12.25  
O2, % 3.80  
HC, PPMC 723  
NOX, PPM 975

.1012  
12.13  
4.00  
293  
825

.0988  
11.21  
5.30  
335  
400

.0515  
11.21  
5.20  
268  
375

.1511  
9.70  
7.00  
2205  
130

.0748  
9.79  
6.75  
1323  
150

AIR/FUEL RATIO

17.69

18.01

19.37

19.34

21.26

21.24

EMISSION RATES, G/HR

CO 336.9  
HC 61.0  
NOX+ 258.6

166.5  
24.3  
214.9

139.1  
23.8  
89.2

74.0  
19.4  
85.2

177.5  
130.6  
23.4

88.8  
79.2  
27.3

OIL TEMPERATURE, F

OIL PRESSURE, PSI

COOLANT TEMPERATURE, F

EXHAUST PRESSURE, IN. H2O

EXHAUST TEMPERATURE, F

227  
40  
191  
30.0  
742

227  
40  
191  
18.0  
924

208  
45  
192  
22.0  
697

208  
45  
192  
13.0  
875

202  
53  
178  
16.0  
672

202  
53  
178  
8.0  
847

\* CORRECTED SAE J8168

+ CORRECTED FOR HUMIDITY



ENGINE: FORD 400 CID  
 FUEL CODE: 7602

	97.1	97.2	98.1	98.2	99.1	99.2
TEST NUMBER	6/ 4/76	6/ 4/76	6/ 4/76	6/ 4/76	6/ 4/76	6/ 4/76
TEST DATE	745.8	745.8	745.8	745.8	745.8	745.8
BAROMETER, MMHG	59	59	59	59	59	59
HUMIDITY, GRAINS/LB	84	84	85	85	87	87
TEMPERATURE, F	2200	2200	2200	2200	2200	2200
ENGINE SPEED, RPM	324.0	324.0	244.0	244.0	130.0	130.0
TORQUE, FT-LB	135.8	135.8	102.3	102.3	54.6	54.6
POWER, BHP*	70.1	70.2	55.0	55.9	31.5	30.7
FUEL RATE, LB/HR	26.0	26.0	28.0	28.0	53.0	53.0
IGNITION TIMING, DEG BTDC	.5	.5	3.0	3.0	11.0	11.0
MANIFOLD VACUUM, IN HG	79.0	79.0	44.0	44.0	21.0	21.0
THROTTLE ANGLE, DEG	98	98	162	162	221	221
INTAKE MAN. TEMP., F						

CONCENTRATIONS, DRY BASIS

CO, %	5.8600	5.8000	5.7800	3.8600	2.0300	.8344
CO2, %	10.50	10.50	10.40	11.66	11.66	12.26
O2, %	.12	.10	.92	.32	2.15	2.30
HC, PPMC	1430	1293	1114	527	681	295
NOX, PPM	750	600	345	370	530	515

AIR/FUEL RATIO

	12.32	12.33	12.82	13.33	15.35	16.16
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EMISSION RATES, G/HR

CO	20963.0	20801.7	16872.8	11840.9	4042.3	1699.2
HC	257.9	233.6	163.9	81.5	68.4	30.3
NOX+	411.2	329.8	154.4	174.0	161.8	160.7

OIL TEMPERATURE, F

	249	249	232	232	222	222
--	-----	-----	-----	-----	-----	-----

OIL PRESSURE, PSI

	38	38	43	43	49	49
--	----	----	----	----	----	----

COOLANT TEMPERATURE, F

	199	199	181	181	172	172
--	-----	-----	-----	-----	-----	-----

EXHAUST PRESSURE, IN. H2O

	127.0	100.0	108.0	80.0	49.0	32.0
--	-------	-------	-------	------	------	------

EXHAUST TEMPERATURE, F

	935	1155	972	1316	842	1146
--	-----	------	-----	------	-----	------

\* CORRECTED SAE J816B  
 + CORRECTED FOR HUMIDITY

ENGINE: FORD 400 CID

FUEL CODE: 7602

TEST NUMBER

BAROMETER, MMHG

HUMIDITY, GRAINS/L8

TEMPERATURE, F

ENGINE SPEED, RPM

TORQUE, FT-L8

POWER, BHP\*

FUEL RATE, L8/HR

IGNITION TIMING, DEG BTDC

MANIFOLD VACUUM, IN HG

THRITTLE ANGLE, DEG

INTAKE MAN. TEMP., F

	100.1	100.2	101.1	101.2	102.1	102.2
6/ 4/76	6/ 4/76	6/ 4/76	6/ 4/76	6/ 4/76	6/ 4/76	6/ 4/76
745.8	745.8	745.8	745.8	745.8	745.8	745.8
59	59	59	59	59	59	59
85	85	85	85	86	86	86
2200	2200	2200	2200	2600	2600	2600
81.0	81.0	32.0	32.0	308.0	308.0	308.0
34.0	34.0	13.4	13.4	152.8	152.8	152.8
22.6	22.7	17.1	16.6	82.2	82.5	82.5
53.5	53.5	54.0	54.0	29.0	29.0	29.0
14.0	14.0	17.5	17.5	1.0	1.0	1.0
16.0	16.0	12.0	12.0	79.0	79.0	79.0
221	221	215	215	96	96	96

CONCENTRATIONS, DRY BASIS

CO, %	.2750
CO2, %	11.22
O2, %	4.55
HC, PPMC	487
NOX, PPM	510

	5.9400
	10.40
	.12
	1429
	625

	.0892
	10.30
	6.00
	332
	175

	.2243
	10.09
	6.25
	1107
	165

	.1511
	11.11
	4.88
	296
	470

AIR/FUEL RATIO

	18.54
--	-------

	12.27
--	-------

	20.41
--	-------

	20.45
--	-------

	19.00
--	-------

EMISSION RATES, G/HR

CO	475.7
HC	42.4
NOX+	135.2

	24932.8
	263.7
	347.4

	24855.3
	301.4
	400.8

	125.8
	23.6
	37.8

	325.7
	81.0
	36.7

	269.1
	26.6
	128.3

OIL TEMPERATURE, F

OIL PRESSURE, PSI

COOLANT TEMPERATURE, F

EXHAUST PRESSURE, IN. H2O

EXHAUST TEMPERATURE, F

	211
	58
	163
	33.0
	768

	259
	42
	201
	140.0
	1226

	259
	42
	201
	171.0
	1012

	207
	64
	161
	14.0
	926

\* CORRECTED SAE J8168  
+ CORRECTED FOR HUMIDITY

ENGINE: FORD 400 CID  
 FUEL CODE: 7602

TEST NUMBER	103.1	103.2	104.1	104.2	105.1	105.2
TEST DATE	6/ 4/76	6/ 4/76	6/ 4/76	6/ 4/76	6/ 5/76	6/ 5/76
BAROMETER, MMHG	745.8	745.8	745.8	745.8	747.6	747.6
HUMIDITY, GRAINS/LB	59	59	59	59	56	56
TEMPERATURE, F	85	85	87	87	81	81
ENGINE SPEED, RPM	2600	2600	2600	2600	2600	2600
TORQUE, FT-LB	231.0	231.0	123.0	123.0	77.0	77.0
POWER, BHP*	114.5	114.5	61.1	61.1	37.9	37.9
FUEL RATE, LB/HR	66.5	67.9	41.7	41.1	27.3	28.1
IGNITION TIMING, DEG BTDC	38.5	38.5	55.0	55.0	54.0	54.0
MANIFOLD VACUUM, IN HG	3.0	3.0	11.0	11.0	14.5	14.5
THROTTLE ANGLE, DEG	39.0	39.0	25.0	25.0	18.0	18.0
INTAKE MAN. TEMP., F	159	159	201	201	217	217

CONCENTRATIONS, DRY BASIS

CO, %	6.2700	5.3700	5.5600	3.5500	.6816	.4570
CO2, %	9.99	10.70	9.50	11.55	12.13	11.90
O2, %	.55	.25	1.60	.77	2.85	3.27
HC, PPMC	1255	772	1047	429	158	141
NOX, PPM	280	290	145	160	290	270

AIR/FUEL RATIO

	12.36	12.62	13.20	13.72	16.69	17.21
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EMISSION RATES, G/HR

CO	21413.0	19045.8	12760.0	8241.0	1277.2	910.5
HC	215.9	138.0	121.1	50.2	15.0	14.2
NOX+	146.6	157.6	51.0	56.9	82.2	81.4

OIL TEMPERATURE, F	249	249	216	216	226	226
OIL PRESSURE, PSI	46	46	58	58	54	54
COOLANT TEMPERATURE, F	188	188	179	179	195	195
EXHAUST PRESSURE, IN. H2O	138.0	109.0	72.0	49.0	44.0	29.0
EXHAUST TEMPERATURE, F	1022	1321	821	1261	885	1129

\* CORRECTED SAE J816B  
 + CORRECTED FOR HUMIDITY



ENGINE: FORD 400 CID  
 FUEL CODE: 7602

TEST NUMBER	106.1	106.2	107.1	107.2	108.1	108.2
TEST DATE	6/ 5/76	6/ 5/76	6/ 5/76	6/ 5/76	6/ 5/76	6/ 5/76
BAROMETER, MMHG	747.6	747.6	747.6	747.6	747.6	747.6
HUMIDITY, GRAINS/LB	56	56	56	56	56	56
TEMPERATURE, F	81	81	81	81	82	82
ENGINE SPEED, RPM	2600	2600	3000	3000	3000	3000
TORQUE, FT-LB	31.0	31.0	290.0	290.0	218.0	218.0
POWER, BHP*	15.3	15.3	164.7	164.7	123.9	123.9
FUEL RATE, LB/HR	22.2	21.3	91.8	91.7	81.8	81.8
IGNITION TIMING, DEG BTDC	55.0	55.0	30.0	30.0	47.0	47.0
MANIFOLD VACUUM, IN HG	18.5	18.5	2.0	2.0	6.5	6.5
THROTTLE ANGLE, DEG	13.0	13.0	79.0	79.0	44.0	44.0
INTAKE MAN. TEMP., F	205	205	88	88	79	79

CONCENTRATIONS, DRY BASIS

CO, %	.6276	.3756	6.0000	5.8800	8.5200	8.3400
CO2, %	11.33	11.22	10.50	10.30	8.92	8.92
O2, %	4.00	4.20	.10	.08	.12	.07
HC, PPMC	202	168	1546	1268	1650	1422
NOX, PPM	75	95	665	600	330	340

AIR/FUEL RATIO

	17.78	18.19	12.25	12.26	11.23	11.26
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EMISSION RATES, G/HR

CO	1020.0	601.6	27957.0	27473.7	32862.5	32273.5
HC	16.6	13.6	363.0	298.5	320.8	277.3
NOX+	18.4	23.0	468.7	424.0	192.5	199.0

OIL TEMPERATURE, F	211	211	279	279	277	277
OIL PRESSURE, PSI	60	60	44	44	45	45
COOLANT TEMPERATURE, F	189	189	205	205	199	199
EXHAUST PRESSURE, IN. H2O	27.0	18.0	216.0	150.0	149.0	120.0
EXHAUST TEMPERATURE, F	888	1107	1062	1289	949	1162

\* CORRECTED SAE J8168  
 + CORRECTED FOR HUMIDITY

ENGINE: FORD 400 CID

FUEL CODE: 7602

TEST NUMBER

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

THROTTLE ANGLE, DEG

INTAKE MAN. TEMP., F

109.1	109.2	110.1	110.2	111.1	111.2
6/ 5/76	6/ 5/76	6/ 5/76	6/ 5/76	6/ 5/76	6/ 5/76
747.6	747.6	747.6	747.6	747.6	747.6
56	56	56	56	56	56
82	82	82	82	82	82
3000	3000	3000	3000	3000	3000
117.0	117.0	52.5	52.5	29.0	29.0
66.5	66.5	29.8	29.8	16.5	16.5
47.8	47.8	29.7	30.0	24.9	24.7
48.0	48.0	57.5	57.5	57.5	57.5
10.5	10.5	15.5	15.5	17.3	17.3
28.0	28.0	18.5	18.5	15.5	15.5
211	211	233	233	239	239

CONCENTRATIONS, DRY BASIS

CO, %	4.7800
CO2, %	10.50
O2, %	.90
HC, PPMC	831
NOX, PPM	170

CO, %	.3468
CO2, %	11.44
O2, %	4.08
HC, PPMC	107
NOX, PPM	120

AIR/FUEL RATIO

AIR/FUEL RATIO	13.19
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AIR/FUEL RATIO	18.06
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EMISSION RATES, G/HR

CO	12492.2
HC	109.5
NOX+	67.2
OIL TEMPERATURE, F	259
OIL PRESSURE, PSI	54
COOLANT TEMPERATURE, F	189
EXHAUST PRESSURE, IN. H2O	94.0
EXHAUST TEMPERATURE, F	1033

CO	1474.7
HC	7.5
NOX+	48.7
OIL TEMPERATURE, F	237
OIL PRESSURE, PSI	61
COOLANT TEMPERATURE, F	178
EXHAUST PRESSURE, IN. H2O	52.0
EXHAUST TEMPERATURE, F	976

CO	966.9
HC	10.1
NOX+	50.7
OIL TEMPERATURE, F	237
OIL PRESSURE, PSI	61
COOLANT TEMPERATURE, F	178
EXHAUST PRESSURE, IN. H2O	34.0
EXHAUST TEMPERATURE, F	1224

CO	642.5
HC	10.0
NOX+	33.6
OIL TEMPERATURE, F	234
OIL PRESSURE, PSI	61
COOLANT TEMPERATURE, F	178
EXHAUST PRESSURE, IN. H2O	41.0
EXHAUST TEMPERATURE, F	918

CO	454.7
HC	7.4
NOX+	50.9
OIL TEMPERATURE, F	234
OIL PRESSURE, PSI	61
COOLANT TEMPERATURE, F	178
EXHAUST PRESSURE, IN. H2O	26.0
EXHAUST TEMPERATURE, F	1152

\* CORRECTED SAE J8168  
+ CORRECTED FOR HUMIDITY





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