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PERFORMANCE CHARACTERISTICS OF AUTOMOTIVE ENGINES IN THE UNITED STATES
First Series - Report No. 15
1975 Dodge Colt 98 CID (1.6 Liters), 2V

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INTERIM REPORT

Prepared for

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NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
Washington DC 20590

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16. Abstract

Experimental data were obtained in dynamometer tests of a 1975 Dodge Colt 1.6 liter (98 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 was 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. Presented are results of experimental work performed to obtain information on performance characteristics of an engine suitable for use in automobiles sold in the United States. The engine used in this work is one of a series of 23 engines to be tested in the current program.

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

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

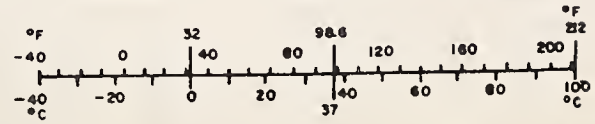
METRIC CONVERSION FACTORS

Approximate Conversions to Metric Measures

Symbol	When You Know	Multiply by	To Find	Symbol
	LENGTH			
in	inches	2.5	centimeters	cm
ft	feet	30	centimeters	cm
yd	yards	0.9	meters	m
mi	miles	1.6	kilometers	km
	AREA			
in^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 (2000 lb)	0.9	tonnes	t
	VOLUME			
tsp	teaspoons	5	milliliters	ml
Tbsp	tablespoons	15	milliliters	ml
fl oz	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	
	MASS (weight)			
g	grams	0.035	ounces	oz
kg	kilograms	2.2	pounds	lb
t	tonnes (1000 kg)	1.1	short tons	
	VOLUME			
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^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



1. INTRODUCTION

Data acquired from steady-state tests of a 1975 Dodge Colt 1.6 liter (98 cubic-inch-displacement) engine are presented in this report. This engine is manufactured in Japan by Mitsubishi and is used in compact size vehicles sold in the United States. The test results are sufficient to establish maps of fuel consumption and emissions of carbon monoxide, unburned hydrocarbons, and oxides of nitrogen over the operating range of the engine.

The objective of this program is to obtain basic engine data to be used in predicting the fuel economy and emission characteristics of current production engines operated in various duty cycles.

2. ENGINE TEST REPORT

General engine specifications for a new mean-tolerance Colt engine are given in table 1. A single batch of unleaded regular-grade fuel was used for the entire break-in and testing program. An analysis of the fuel appears in table 2.

Prior to testing, the Colt engine was operated in a vehicle over public roads for a break-in period of approximately 2,000 miles. The engine was then removed from the vehicle, mounted on a test stand, and coupled to an eddy-current dynamometer. All engine accessories except the radiator and fan were transferred to the test stand setup. Engine cooling was provided by an external cooling tower. The electrical requirements of the test stand mounted engine were met by an external battery and recharging system instead of the standard alternator charging system.

Steady-state tests of the engine were made at 11 different speeds to include the entire range of engine operation. Load on the engine was varied in steps from zero to the maximum attainable at each speed. Additionally, the engine was motored by an electric motor at several speeds to simulate closed-throttle decelerations. Table 3 indicates the speed/load combinations tested and may be used as an index to the tabulated data at the end of this report.

The following data were recorded:

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_2, pct -- Beckman NDIR
O_2, pct -- Beckman polarographic detector
HC, ppmC -- Custom-built heated flame ionization detector
NO_x, ppm -- Thermo-Electron chemiluminescent detector
Oil temperature, °F
Oil pressure, psig
Coolant temperature, °F
Exhaust temperature, °F
Exhaust pressure, in. H_2O
Intake manifold temperature, °F.

The following equations were used in calculating power, air/fuel 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 = dewpoint, °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. Stoichiometric air/fuel ratio (dimensionless):

$$AF_S = \frac{69(2 + \frac{x}{2} - y)}{MW_{fuel}} ,$$

where x = hydrogen-carbon atomic ratio of fuel,
y = oxygen-carbon atomic ratio of fuel,
MW_{fuel} = fuel molecular weight per carbon atom,
= 12.01115 + 1.00797x + 15.9994y.

5. Hydrogen concentration in raw exhaust (percent):

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

where CO = carbon-monoxide concentration (percent),
CO_2 = carbon-dioxide concentration (percent).

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

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

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

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

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

7. Air/fuel ratio (dimensionless):

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

where O_2 = oxygen concentration (percent),
NO_x = oxides of nitrogen (ppm),
HC = unburned hydrocarbon concentration (ppmC).

8. Exhaust flow (pounds per hour):

$$M_{EX} = M_F(1 + AF),$$

where M_F = fuel flow rate (pounds per hour).

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

$$M_{CO} = \frac{M_{EX}}{C_w}(\frac{CO}{100})(\frac{MW_{CO}}{MW_{EX}})453.59237,$$

where MW_{CO} = molecular weight of CO (=28.01115),
MW_{EX} = molecular weight of exhaust gas (=28.967).

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

$$M_{HC} = M_{EX}(\frac{HC}{10^6})(\frac{MW_{HC}}{MW_{EX}})453.59237$$

where MW_{HC} = molecular weight per carbon atom of HC,
= 12.01115 + 1.00797x + 15.9994y.

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

$$M_{NO_x} = \frac{M_{EX}}{C_w}(\frac{NO_x}{10^6})(\frac{MW_{NO_x}}{MW_{EX}})(K_H)453.59237,$$

where MW_{NO_x} = molecular weight of NO_2 (=46.0028).

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

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

where N = engine speed (revolutions per minute),
T = brake torque (foot-pounds),
t = air temperature (°F).

3. DISCUSSION OF TEST RESULTS

The maximum torque and power output (figure 1) measured in this test were somewhat lower than those quoted in table 1. Air/fuel ratio decreased as brake horsepower increased (figure 2). Emissions of CO, HC, and NO_x (figure 3,4, and 5) are typical of well controlled late-model engines. Fuel rate increased as brake horsepower increased (figure 6). Emissions were maintained at low levels for the low-power modes typical of urban driving. Carbon monoxide emissions increased greatly as the air/fuel ratio decreased near wide-open-throttle operation. Hydrocarbon emissions tended to be high during idle and low-power operation, probably because exhaust temperature was too low to permit efficient oxidation by the engine's air injection system.

The repeatability of emission rates, fuel consumption, and engine performance was satisfactory for the purposes of these tests.

4. CONCLUSIONS

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

TABLE 1. MANUFACTURER'S ENGINE SPECIFICATIONS

Displacement, cu. in.	97.5
Maximum horsepower, bhp @ 5,300 rpm	79
Maximum torque, lb-ft @ 3,000 rpm	86
Bore and stroke, in.	3.03 X 3.39
Configuration	in-line upright 4-cylinder
Compression ratio	8.5
Firing order	1-3-4-2
Ignition timing at idle speed, ° @ 850 rpm	0
Block material	cast iron
Head material	cast iron
Number of crankshaft main bearings	5
Number of compression rings/piston	2
Number of oil rings/piston	1
Cam drive type	chain and sprocket
Valve lift:	
Intake, in.	0.375
Exhaust, in.	0.375
Valve timing:	
Intake opens, °BTC	32
Intake closes, °ABC	60
Exhaust opens, °BBC	63
Exhaust closes, °ATC	29
Spark plug gap, inches	0.028 to 0.031
Engine weight, lb	300
Exhaust-gas-recirculation system:	
Valve type	tapered stem
Control signal	ported vacuum
Point of discharge	intake manifold
Crankcase emission control:	
Control method	positive crankcase ventilation
Point of discharge	intake manifold and breather
Air-injection system:	
Pump type	rotary vane
Control signal	ported vacuum
Point of discharge	exhaust manifold
Carburetor type	2V downdraft
Distributor specifications:	
Centrifugal advance, begins at 500 distributor* rpm	0°
Centrifugal advance, full at 3050 distributor rpm	28°
Vacuum advance, begins at 6.69 in. Hg	0°
Vacuum advance, maximum at 15.75 in. Hg	17°
Vacuum retard, begins at 8.66 in. Hg	0°
Vacuum retard, maximum at 11.00 in. Hg	5°
Carburetor number	28-32DIDTA
EGR valve number	K5T50271
Distributor number	T3T04271

*Distributor rpm = ½ engine rpm.

TABLE 2. FUEL SPECIFICATIONS

Fuel No.	7619
Research octane No.	91.5
Motor octane No.	83.5
Specific gravity	0.7160
Reid vapor pressure, psig	9.5
Distillation, °F:	
10 pct evaporated	128
50 pct "	218
95 pct "	404
100 pct "	417
API gravity, deg	66.1
FIA analysis, pct:	
Aromatics	6
Olefins	17
Paraffins	77
Sulfur, pct	0.024
Lead, g/gal	Trace
Hydrogen/carbon ratio	2.040
Oxygen/carbon atomic ratio	0.000

TABLE 3. TEST-NUMBER CROSS-REFERENCE INDEX

Pct Full Load	Engine Speed, rpm										
	850	1,000	1,500	2,000	2,500	3,000	3,600	4,000	4,500	5,300	5,500
0	7.1	16.1 83.1	23.1 87.1	30.1 91.1	37.1 95.1	44.1 99.1	51.1 103.1	58.1 107.1	65.1 116.1	72.1 115.1	
10		15.1	22.1	29.1	36.1	43.1	50.1	57.1	64.1	71.1	
25		14.1 82.1	21.1 86.1	28.1 90.1	35.1 94.1	42.1 98.1	49.1 102.1	56.1 106.1	63.1 110.1	70.1 114.1	
50	8.1	13.1	20.1	27.1	34.1	41.1	48.1	55.1		69.1	
60			85.1	89.1	93.1	97.1	101.1	105.1	109.1	113.1	
75		12.1 81.1	19.1	26.1	33.1	40.1	47.1	54.1	61.1	68.1	
90		11.1 80.1	18.1 84.1	25.1 88.1	32.1 92.1	39.1 96.1	46.1 100.1	53.1 104.1	60.1 108.1	67.1	
100	9.1	10.1	17.1	24.1	31.1	38.1	45.1	52.1	59.1	66.1 112.1	133.1
Motored		156.1	157.1	158.1							

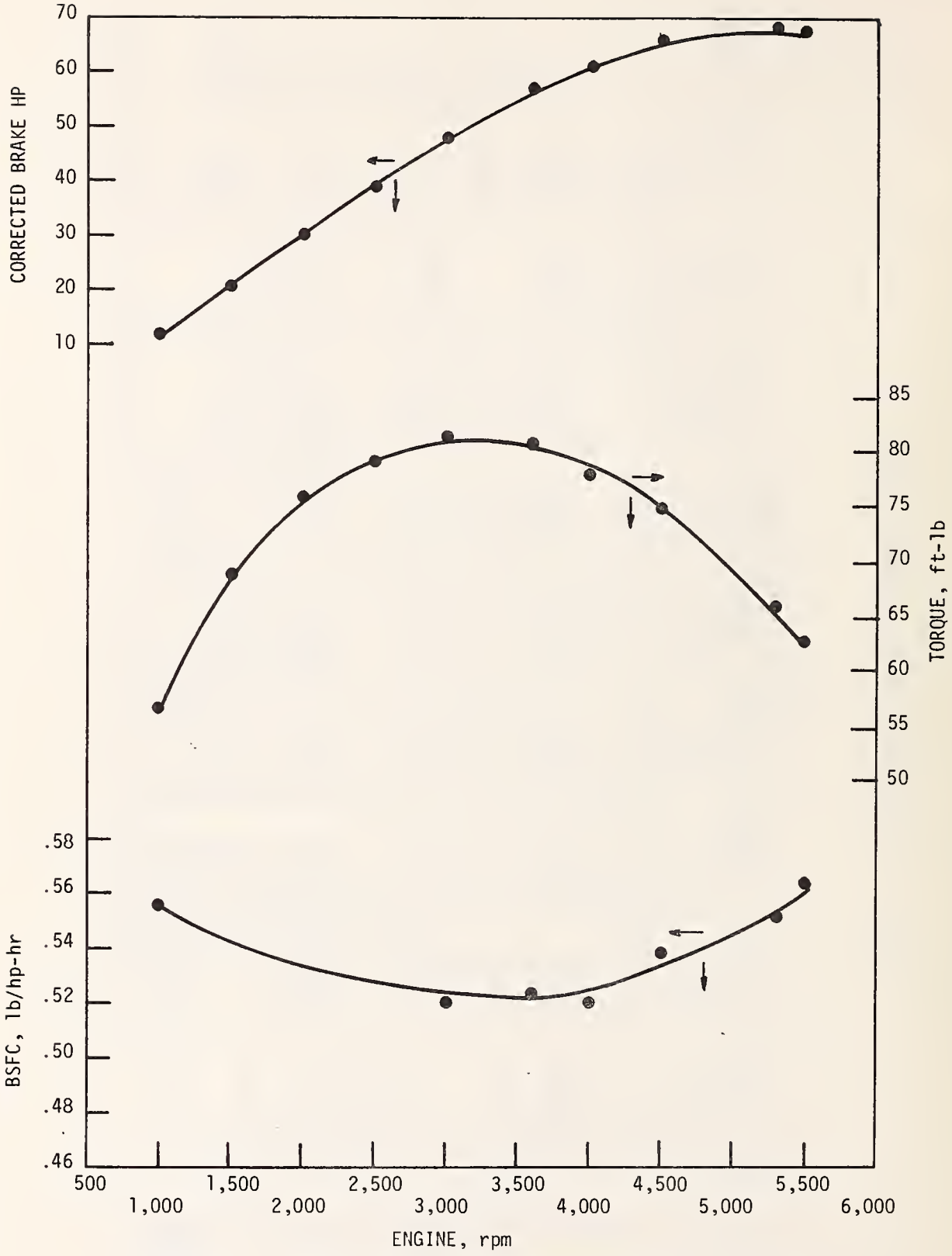


FIGURE 1. Brake Specific Fuel Consumption, Torque, and Brake Horsepower versus Engine rpm at Wide-Open-Throttle--98-CID Colt Engine.

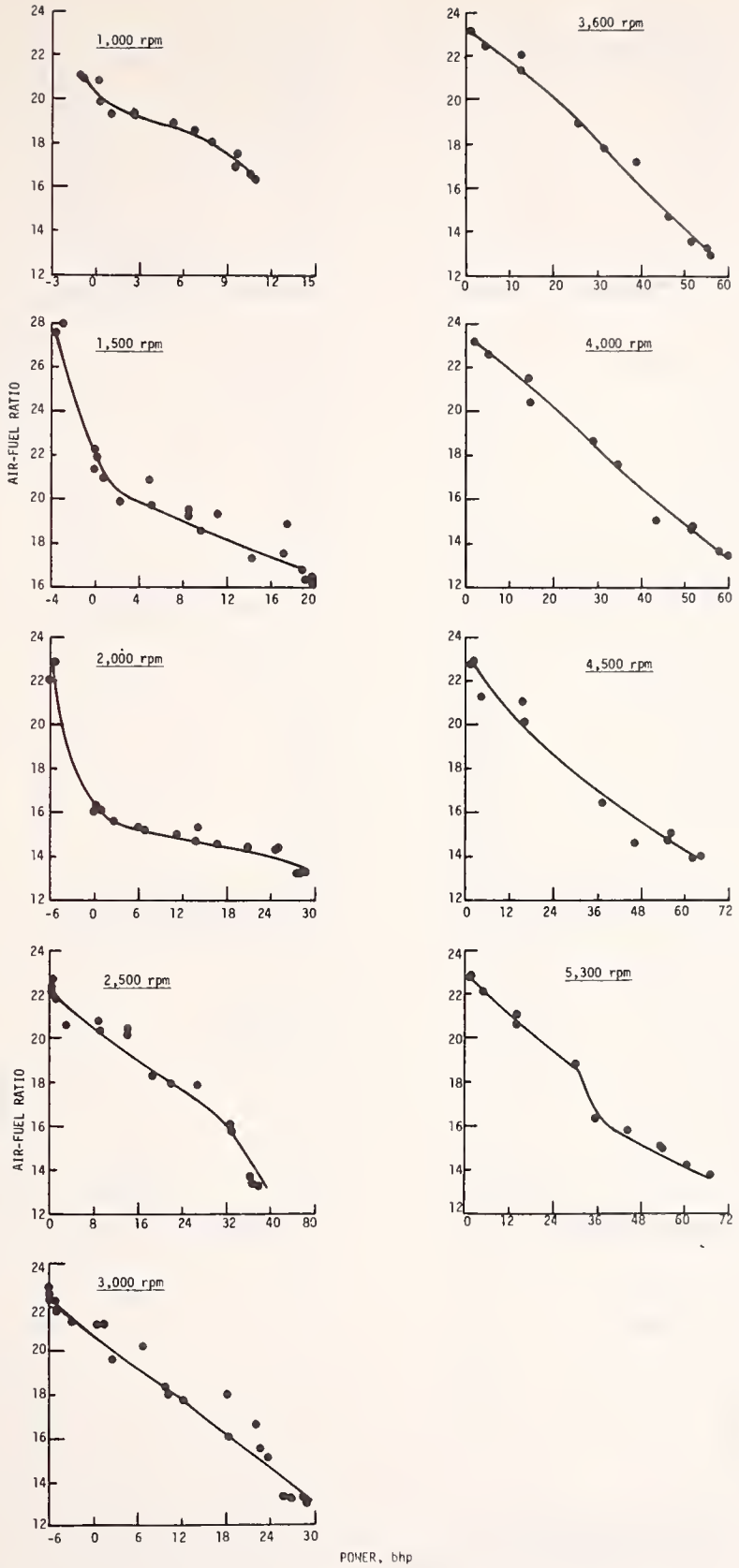


FIGURE 2. Air/Fuel Ratio versus Power at Various Speed and Load Conditions--98-CID Colt Engine.

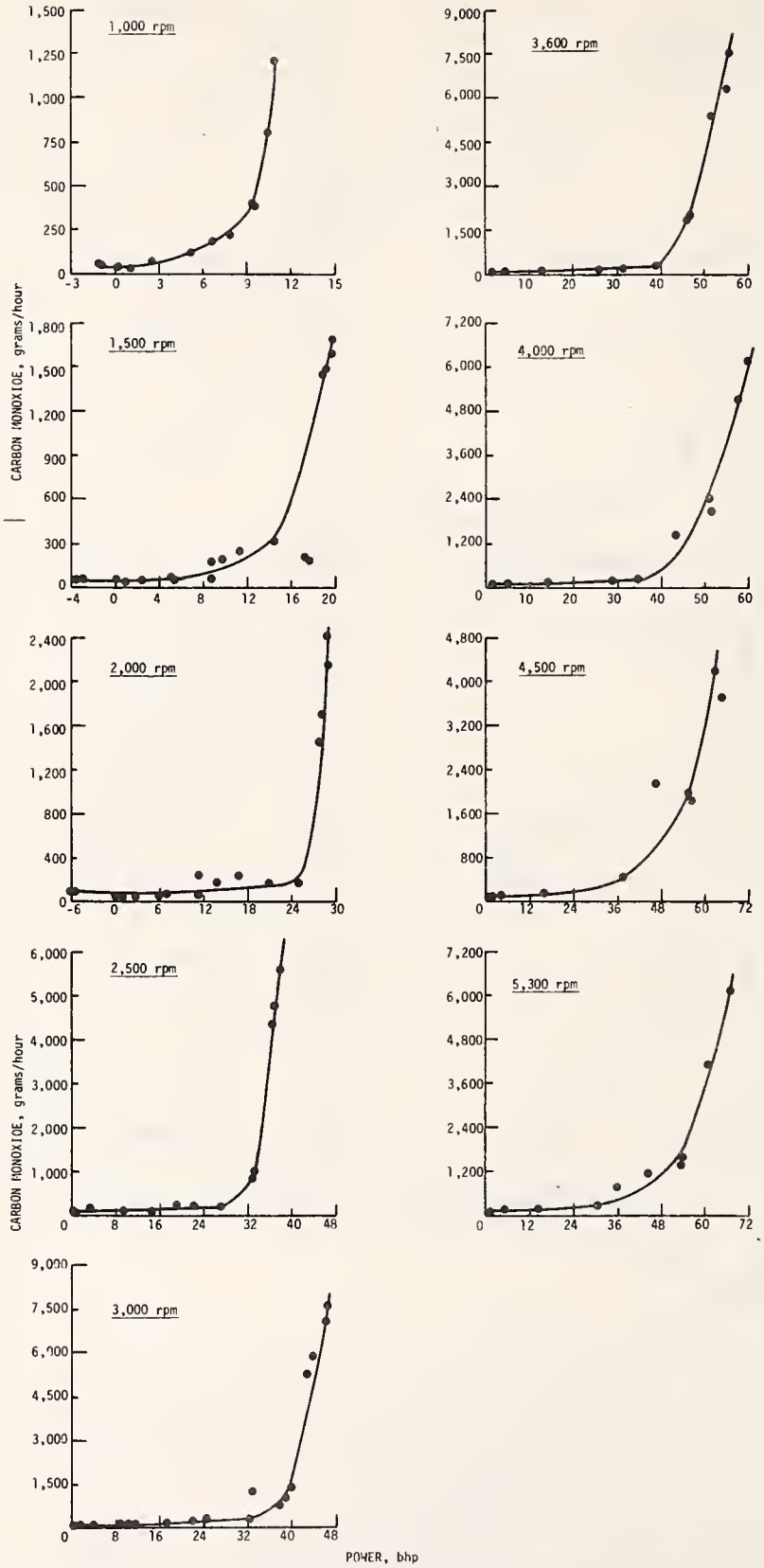


FIGURE 3. Carbon Monoxide Emissions versus power at Various Speed and Load Conditions--98-CID Colt Engine.

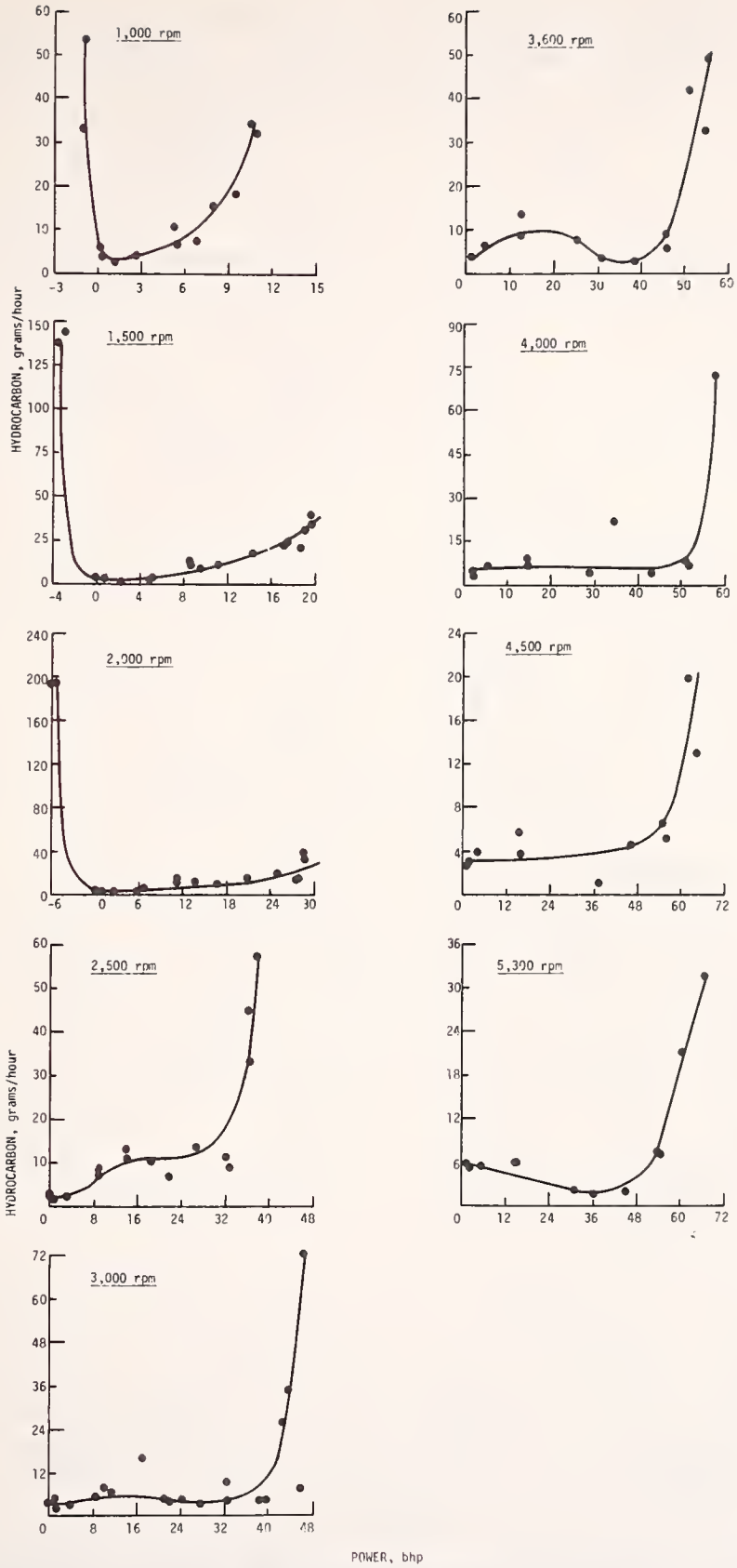


FIGURE 4. Hydrocarbon Emissions versus Power at Various Speed and Load Conditions--98-CID Colt Engine.

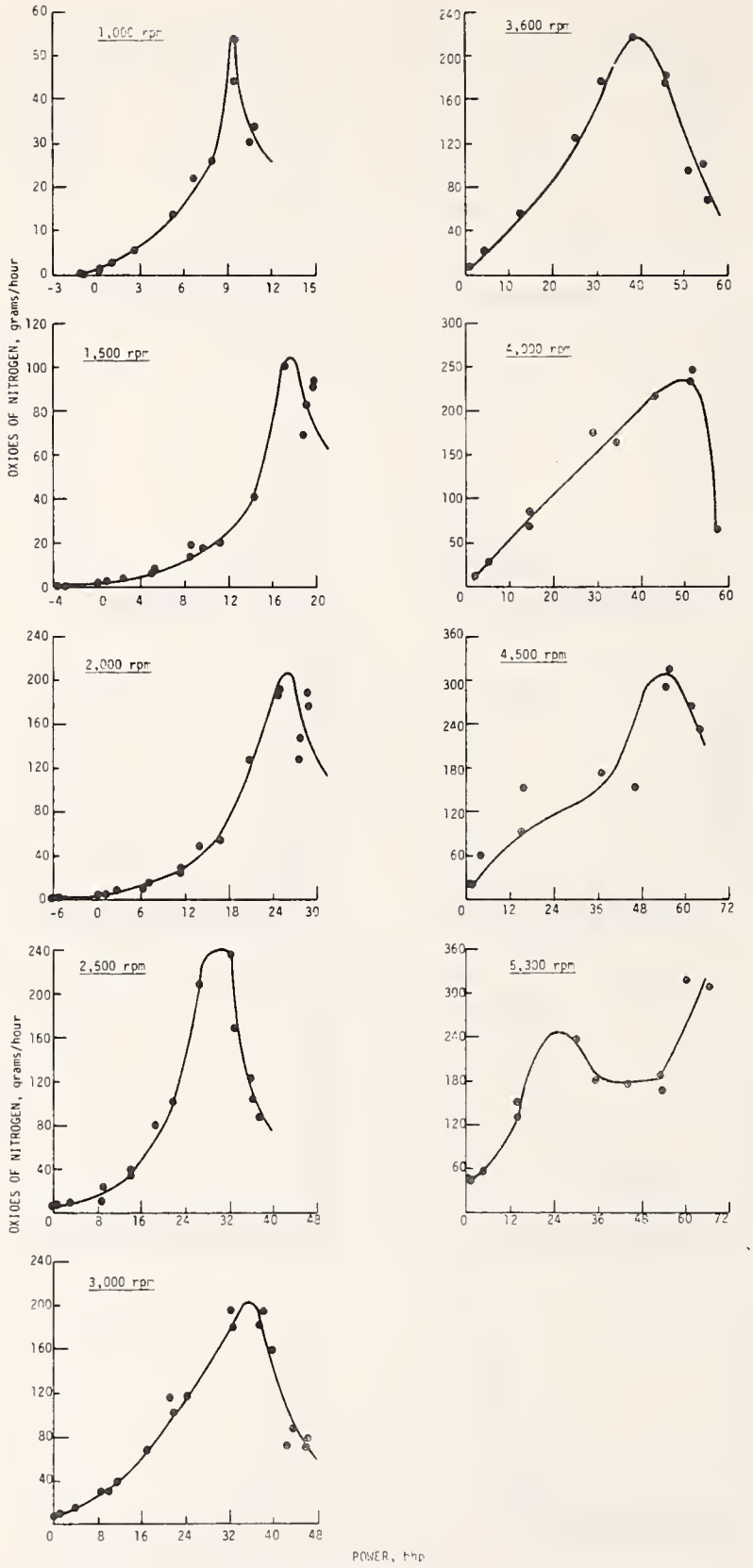


FIGURE 5. Oxides of Nitrogen Emissions versus Power at Various Speed and Load Conditions--98-CID Colt Engine.

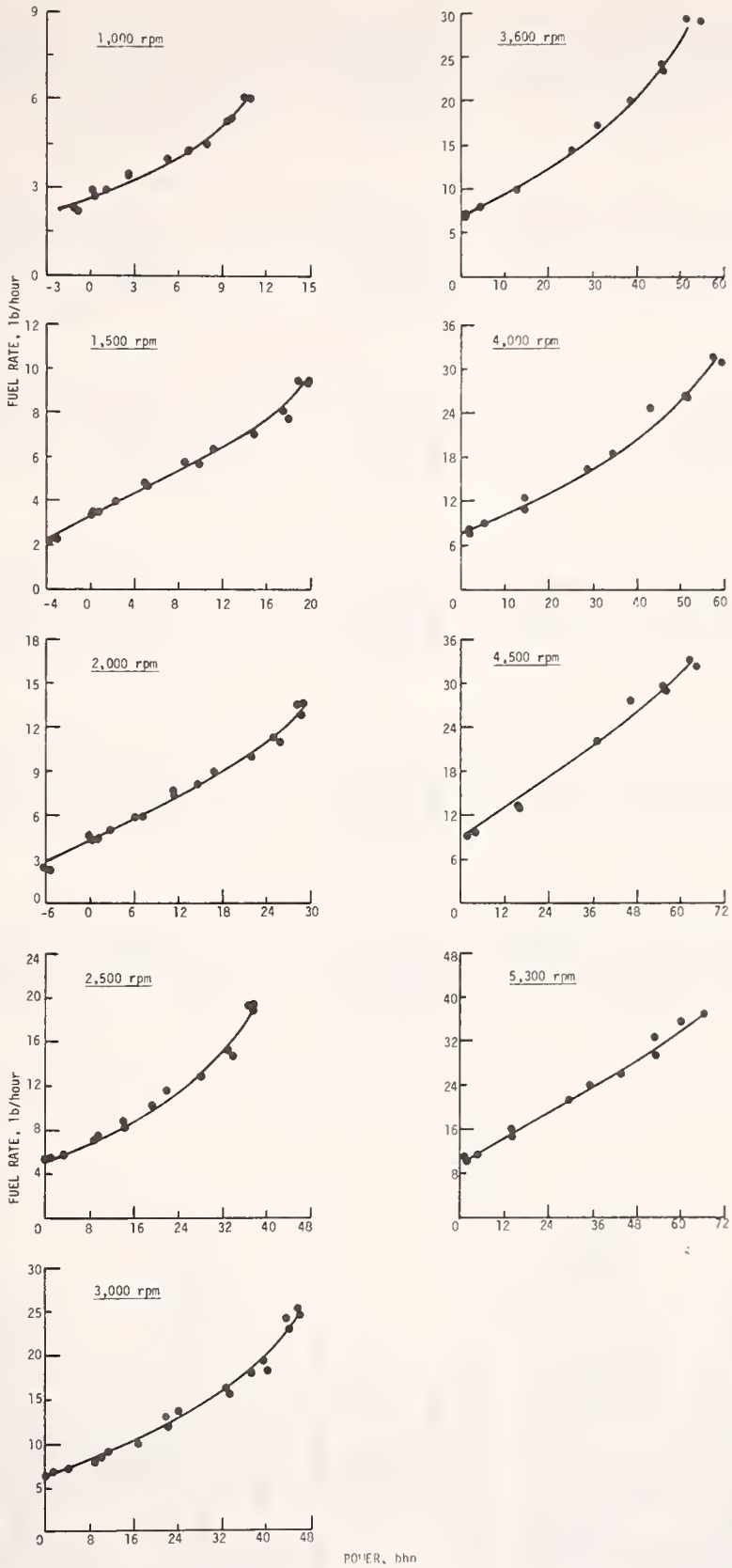


FIGURE 6. Fuel Rate versus Power at Various Speed and Load Conditions--98-CID Colt Engine.

ENGINE CODE COLT98

TEST NUMBER	7.1	8.1	9.1	10.1	11.1	12.1
TEST DATE	7/29/76	7/29/76	7/29/76	7/29/76	7/29/76	7/29/76
FUEL CODE	7619	7619	7619	7619	7619	7619
BAROMETER, MMHG	741.6	741.6	741.6	741.6	741.6	741.6
HUMIDITY, GRAINS/LB	72	72	72	72	72	72
TEMPERATURE, F	96	97	97	102	95	97
ENGINE SPEED, RPM	850	850	850	1000	1000	1000
TORQUE, FT-LB	1.0	16.0	30.0	54.0	48.6	40.5
POWER, BHP*	.2	2.6	5.0	10.5	9.4	7.9
FUEL RATE, LB/HR	2.2	3.1	3.4	6.1	5.3	4.5
IGNITION TIMING, DEG BTDC	-5.0	-4.0	-1.0	2.0	2.0	2.0
MANIFOLD VACUUM, IN HG	13.6	9.9	7.2	.4	3.2	5.7
THROTTLE ANGLE, DEG	.0	5.0	7.0	71.0	19.0	12.0
INTAKE MAN. TEMP., F	182	157	151	131	137	143
CONCENTRATIONS, DRY BASIS						
CO, %	.3598	.5080	.7950	1.8890	1.0780	.6634
CO2, %	10.79	11.33	11.55	10.60	11.55	11.22
O2, %	5.60	4.40	4.10	3.93	3.65	4.60
HC, PPMC	712	615	1123	1624	979	917
NOX, PPM	37	110	205	440	735	480
AIR/FUEL RATIO	19.40	18.09	17.49	16.68	16.98	18.12
EMISSION RATES, G/HR						
CO	63.9	116.5	196.8	799.2	401.3	221.6
HC	6.4	7.1	14.0	34.5	18.3	15.4
NOX+	1.1	4.1	8.2	30.3	44.5	26.1
OIL TEMPERATURE, F	176	178	182	185	188	188
OIL PRESSURE, PSI	16	17	15	20	19	19
COOLANT TEMPERATURE, F	182	184	183	184	184	183
EXHAUST PRESSURE, IN. H2O	.0	.0	.0	8.0	6.0	4.0
EXHAUST TEMPERATURE, F	746	796	784	964	958	858

* CORRECTED SAE J816B
\+ CORRECTED FOR HUMIDITY

ENGINE CODE COLT98

TEST NUMBER	13.1	14.1	15.1	16.1	17.1	18.1
TEST DATE	7/29/76	7/29/76	7/29/76	7/29/76	7/29/76	7/29/76
FUEL CODE	7619	7619	7619	7619	7619	7619
BAROMETER, MMHG	741.6	741.6	746.1	746.1	746.1	746.1
HUMIDITY, GRAINS/LB	72	72	72	72	72	72
TEMPERATURE, F	96	97	97	98	87	87
ENGINE SPEED, RPM	1000	1000	1000	1000	1500	1500
TORQUE, FT-LB	27.0	13.5	5.4	1.2	67.0	60.0
POWER, BHP*	5.2	2.6	1.0	.2	19.2	17.2
FUEL RATE, LB/HR	4.0	3.5	2.9	2.7	9.4	7.8
IGNITION TIMING, DEG BTDC	.0	-3.0	-5.0	-5.0	9.0	9.0
MANIFOLD VACUUM, IN HG	8.0	10.9	12.6	14.0	.9	2.7
THROTTLE ANGLE, DEG	8.5	6.0	3.5	2.0	71.0	29.5
INTAKE MAN. TEMP., F	146	153	162	170	131	140
CONCENTRATIONS, DRY BASIS						
CO, %	.3965	.2584	.1465	.1650	2.3280	.3500
CO2, %	11.01	11.01	11.01	10.60	10.60	11.55
O2, %	5.20	5.30	5.30	5.75	3.75	3.70
HC, PPMC	669	279	223	333	1011	818
NOX, PPM	265	120	75	50	810	1100
AIR/FUEL RATIO	18.96	19.23	19.35	19.89	16.34	17.59
EMISSION RATES, G/HR						
CO	125.4	71.6	34.4	36.6	1480.2	198.8
HC	10.6	3.9	2.6	3.7	32.3	23.3
NOX+	13.6	5.4	2.9	1.8	83.5	101.3
OIL TEMPERATURE, F	187	186	186	185	197	198
OIL PRESSURE, PSI	20	21	20	21	33	31
COOLANT TEMPERATURE, F	182	182	181	181	185	184
EXHAUST PRESSURE, IN. H2O	3.0	3.0	.0	.0	15.0	12.0
EXHAUST TEMPERATURE, F	837	855	848	809	1088	1065

* CORRECTED SAE J816B
\+ CORRECTED FOR HUMIDITY

ENGINE CODE COLT98

TEST NUMBER	19.1	20.1	21.1	22.1	23.1	24.1
TEST DATE	7/29/76	7/29/76	7/29/76	7/29/76	7/29/76	7/29/76
FUEL CODE	7619	7619	7619	7619	7619	7619
BAROMETER, MMHG	746.1	746.1	746.1	746.1	746.1	746.1
HUMIDITY, GRAINS/LB	72	72	72	72	72	72
TEMPERATURE, F	87	87	92	91	91	87
ENGINE SPEED, RPM	1500	1500	1500	1500	1500	2000
TORQUE, FT-LB	50.0	33.5	18.0	8.0	2.8	72.6
POWER, BHP*	14.4	9.6	5.2	2.3	.8	27.8
FUEL RATE, LB/HR	7.1	5.7	4.7	4.0	3.5	12.9
IGNITION TIMING, DEG BTDC	9.0	8.0	6.0	3.0	2.0	13.0
MANIFOLD VACUUM, IN HG	4.7	8.3	12.3	14.8	15.8	1.1
THROTTLE ANGLE, DEG	22.0	15.0	10.5	8.0	6.0	71.0
INTAKE MAN. TEMP., F	144	145	151	162	171	125
CONCENTRATIONS, DRY BASIS						
CO, %	.6125	.4250	.1449	.1430	.1125	1.7935
CO2, %	11.44	10.90	10.40	10.30	9.70	11.78
O2, %	3.65	4.70	5.40	5.50	6.25	1.80
HC, PPMC	728	418	166	94	198	340
NOX, PPM	500	250	138	78	55	975
AIR/FUEL RATIO	17.36	18.58	19.72	19.88	20.95	15.22
EMISSION RATES, G/HR						
CO	311.3	187.7	55.8	46.9	34.2	1457.2
HC	18.6	9.3	3.2	1.5	3.0	13.9
NOX+	41.2	17.9	8.6	4.1	2.7	128.4
OIL TEMPERATURE, F	196	196	194	191	191	191
OIL PRESSURE, PSI	32	33	33	34	34	48
COOLANT TEMPERATURE, F	182	181	183	180	181	181
EXHAUST PRESSURE, IN. H2O	11.0	9.0	8.0	5.0	4.0	21.0
EXHAUST TEMPERATURE, F	1043	996	962	939	918	1212

* CORRECTED SAE J816B
\+ CORRECTED FOR HUMIDITY

ENGINE CODE COLT98

TEST NUMBER	25.1	26.1	27.1	28.1	29.1	30.1
TEST DATE	7/29/76	7/29/76	7/29/76	7/29/76	7/29/76	7/29/76
FUEL CODE	7619	7619	7619	7619	7619	7619
BAROMETER, MMHG	746.1	746.1	746.1	746.1	746.1	746.1
HUMIDITY, GRAINS/LB	72	72	72	72	72	72
TEMPERATURE, F	87	87	87	87	96	89
ENGINE SPEED, RPM	2000	2000	2000	2000	2000	2000
TORQUE, FT-LB	65.7	54.8	36.5	18.3	7.3	2.8
POWER, BHP*	25.2	21.0	14.0	7.0	2.8	1.1
FUEL RATE, LB/HR	11.0	10.0	8.0	5.9	4.9	4.3
IGNITION TIMING, DEG BTDC	13.0	14.0	14.0	14.0	9.0	7.0
MANIFOLD VACUUM, IN HG	2.0	4.2	8.2	13.2	16.1	17.5
THROTTLE ANGLE, DEG	42.0	30.0	21.0	13.5	10.0	9.0
INTAKE MAN. TEMP., F	130	143	150	150	155	163
CONCENTRATIONS, DRY BASIS						
CO, %	.2015	.2375	.3000	.1440	.1013	.1013
CO2, %	12.01	12.01	11.55	11.01	10.30	10.09
O2, %	4.25	4.40	5.00	6.00	6.75	7.75
HC, PPMC	472	388	370	200	83	94
NOX, PPM	1450	1050	500	192	113	76
AIR/FUEL RATIO	18.11	18.19	18.75	19.98	21.11	22.19
EMISSION RATES, G/HR						
CO	165.5	178.3	185.6	69.8	43.4	39.9
HC	19.5	14.6	11.5	4.9	1.8	1.9
NOX+	193.1	127.8	50.1	15.1	7.8	4.9
OIL TEMPERATURE, F	193	203	206	200	199	196
OIL PRESSURE, PSI	48	46	44	47	47	48
COOLANT TEMPERATURE, F	184	183	182	180	182	181
EXHAUST PRESSURE, IN. H2O	20.0	17.0	11.0	8.0	4.0	3.0
EXHAUST TEMPERATURE, F	1143	1179	1111	1037	1014	988

* CORRECTED SAE J816B
\+ CORRECTED FOR HUMIDITY

ENGINE CODE COLT98

TEST NUMBER	31.1	32.1	33.1	34.1	35.1	36.1
TEST DATE	7/29/76	7/29/76	7/29/76	7/30/76	7/30/76	7/30/76
FUEL CODE	7619	7619	7619	7619	7619	7619
BAROMETER, MMHG	746.1	746.1	746.1	741.1	741.1	741.1
HUMIDITY, GRAINS/LB	72	72	72	71	71	71
TEMPERATURE, F	87	87	87	87	87	87
ENGINE SPEED, RPM	2500	2500	2500	2500	2500	2500
TORQUE, FT-LB	76.0	68.4	56.0	39.0	19.0	6.6
POWER, BHP*	36.4	32.7	26.8	18.8	9.2	3.2
FUEL RATE, LB/HR	18.9	14.8	12.9	10.3	7.6	5.9
IGNITION TIMING, DEG BTDC	15.0	15.0	15.0	17.0	19.0	13.0
MANIFOLD VACUUM, IN HG	1.1	2.6	3.7	8.0	13.1	16.2
THROTTLE ANGLE, DEG	71.0	45.0	39.0	23.0	15.0	11.5
INTAKE MAN. TEMP., F	118	133	139	141	153	189
CONCENTRATIONS, DRY BASIS						
CO, %	4.0910	.8805	.2132	.3339	.2011	.3756
CO2, %	11.90	13.01	12.50	11.90	10.70	10.50
O2, %	1.12	2.30	4.07	4.50	6.30	6.70
HC, PPMC	848	228	288	253	267	83
NOX, PPM	710	1500	1363	640	225	108
AIR/FUEL RATIO	13.68	16.04	17.86	18.23	20.32	20.62
EMISSION RATES, G/HR						
CO	4348.4	855.1	201.5	259.3	128.2	189.8
HC	45.3	11.1	13.7	9.9	8.5	2.1
NOX+	122.4	236.2	208.8	80.2	23.1	8.8
OIL TEMPERATURE, F	210	214	214	201	202	206
OIL PRESSURE, PSI	55	53	54	57	58	56
COOLANT TEMPERATURE, F	183	184	183	183	183	182
EXHAUST PRESSURE, IN. H2O	32.0	26.0	24.0	17.0	10.0	8.0
EXHAUST TEMPERATURE, F	1425	1339	1255	1188	1075	1062

* CORRECTED SAE J8168
\+ CORRECTED FOR HUMIDITY

ENGINE CODE COLT98

TEST NUMBER	37.1	38.1	39.1	40.1	41.1	42.1
TEST DATE	7/30/76	7/30/76	7/30/76	7/30/76	7/30/76	7/30/76
FUEL CODE	7619	7619	7619	7619	7619	7619
BAROMETER, MMHG	741.1	741.1	741.1	741.1	741.1	741.1
HUMIDITY, GRAINS/LB	71	71	71	71	71	71
TEMPERATURE, F	95	87	87	87	87	87
ENGINE SPEED, RPM	2500	3000	3000	3000	3000	3000
TORQUE, FT-LB	1.6	74.0	67.0	56.0	37.0	15.0
POWER, BHP*	.8	42.8	38.7	32.4	21.4	8.7
FUEL RATE, LB/HR	5.4	22.9	18.2	15.6	11.9	7.8
IGNITION TIMING, DEG BTDC	10.0	16.0	16.0	16.0	16.0	19.0
MANIFOLD VACUUM, IN HG	17.3	.8	2.5	4.4	6.9	15.5
THROTTLE ANGLE, DEG	9.5	71.0	47.0	42.0	29.0	14.5
INTAKE MAN. TEMP., F	161	117	130	137	142	153
CONCENTRATIONS, DRY BASIS						
CO, %	.1036	4.1800	.8706	.2205	.1682	.1420
CO2, %	9.99	12.25	13.26	11.89	11.78	10.19
O2, %	7.20	.40	1.45	4.00	4.30	6.75
HC, PPMC	66	403	64	157	90	133
NOX, PPM	78	360	1050	1050	800	260
AIR/FUEL RATIO	21.73	13.27	15.44	17.95	18.27	21.12
EMISSION RATES, G/HR						
CO	50.2	5213.2	999.5	254.8	150.7	97.4
HC	1.6	25.2	3.7	9.1	4.0	4.6
NOX+	6.1	72.4	194.5	195.7	115.6	28.8
OIL TEMPERATURE, F	204	192	226	218	223	216
OIL PRESSURE, PSI	57	63	56	61	62	62
COOLANT TEMPERATURE, F	182	187	187	185	184	182
EXHAUST PRESSURE, IN. H2O	6.0	42.0	36.0	28.0	21.0	10.0
EXHAUST TEMPERATURE, F	1054	1570	1456	1307	1279	1086

* CORRECTED SAE J816B
\+ CORRECTED FOR HUMIDITY

ENGINE CODE COLT98

TEST NUMBER	43.1	44.1	45.1	46.1	47.1	48.1
TEST DATE	7/30/76	7/30/76	8/ 2/76	8/ 2/76	8/ 2/76	8/ 2/76
FUEL CODE	7619	7619	7619	7619	7619	7619
BAROMETER, MMHG	741.1	741.1	748.5	748.5	748.5	748.5
HUMIDITY, GRAINS/LB	71	71	64	64	64	64
TEMPERATURE, F	87	87	88	88	89	88
ENGINE SPEED, RPM	3000	3000	3600	3600	3600	3600
TORQUE, FT-LB	7.0	2.4	75.0	67.0	56.4	37.0
POWER, BHP*	4.0	1.4	51.5	46.0	38.7	25.4
FUEL RATE, LB/HR	7.1	7.0	29.5	24.4	20.1	14.5
IGNITION TIMING, DEG BTDC	18.0	19.0	18.0	18.0	18.0	22.0
MANIFOLD VACUUM, IN HG	16.2	17.1	.9	2.9	4.6	8.9
THROTTLE ANGLE, DEG	12.0	11.0	71.0	56.0	45.0	34.0
INTAKE MAN. TEMP., F	164	164	105	118	126	129
CONCENTRATIONS, DRY BASIS						
CO, %	.1325	.1084	3.3040	1.2750	.2132	.1465
CO2, %	10.09	9.99	12.25	13.40	13.01	11.55
O2, %	6.80	7.20	.30	.65	3.22	5.00
HC, PPMC	66	44	516	120	36	134
NOX, PPM	140	90	375	775	1000	713
AIR/FUEL RATIO	21.25	21.73	13.51	14.68	17.13	18.93
EMISSION RATES, G/HR						
CO	82.9	68.6	5422.1	1870.3	300.1	166.0
HC	2.1	1.4	42.5	8.9	2.6	7.6
NOX+	14.1	9.2	96.1	177.6	219.9	126.2
OIL TEMPERATURE, F	214	214	217	231	229	224
OIL PRESSURE, PSI	61	62	61	61	61	62
COOLANT TEMPERATURE, F	183	182	186	184	183	182
EXHAUST PRESSURE, IN. H2O	7.0	7.0	65.0	54.0	40.0	25.0
EXHAUST TEMPERATURE, F	1086	1104	1607	1599	1495	1270

* CORRECTED SAE J816B
\+ CORRECTED FOR HUMIDITY

ENGINE CODE COLT98

TEST NUMBER	49.1	50.1	51.1	52.1	53.1	54.1
TEST DATE	8/ 2/76	8/ 2/76	8/ 2/76	8/ 3/76	8/ 3/76	8/ 3/76
FUEL CODE	7619	7619	7619	7619	7619	7619
BAROMETER, MMHG	748.5	748.5	748.5	751.5	751.5	751.5
HUMIDITY, GRAINS/LB	64	64	64	62	62	62
TEMPERATURE, F	87	87	85	89	91	92
ENGINE SPEED, RPM	3600	3600	3600	4000	4000	4000
TORQUE, FT-LB	18.4	6.2	1.8	76.0	68.0	57.0
POWER, BHP*	12.6	4.3	1.2	57.8	51.8	43.4
FUEL RATE, LB/HR	9.9	8.0	7.3	31.9	26.6	24.9
IGNITION TIMING, DEG BTDC	30.0	28.0	25.0	18.0	18.0	18.0
MANIFOLD VACUUM, IN HG	14.3	16.9	17.6	1.1	2.7	3.6
THROTTLE ANGLE, DEG	26.0	12.0	9.0	71.0	58.0	47.0
INTAKE MAN. TEMP., F	137	145	145	109	118	121
CONCENTRATIONS, DRY BASIS						
CO, %	.1180	.1108	.0844	2.8600	1.2800	.9125
CO2, %	9.89	9.70	9.40	13.14	13.53	13.53
O2, %	7.50	7.75	8.10	.15	.73	.90
HC, PPMC	292	165	99	807	80	51
NOX, PPM	400	190	70	240	1000	920
AIR/FUEL RATIO	22.04	22.46	23.11	13.63	14.74	15.03
EMISSION RATES, G/HR						
CO	107.5	82.7	59.3	5075.4	2052.7	1396.9
HC	13.4	6.2	3.5	71.9	6.5	4.0
NOX+	56.9	22.2	7.7	65.9	248.3	218.1
OIL TEMPERATURE, F	217	215	194	223	237	237
OIL PRESSURE, PSI	63	63	65	62	60	60
COOLANT TEMPERATURE, F	182	181	183	186	185	185
EXHAUST PRESSURE, IN. H2O	13.0	8.0	6.0	82.0	66.0	59.0
EXHAUST TEMPERATURE, F	1097	1068	1035	1669	1633	1616

* CORRECTED SAE J816B
\+ CORRECTED FOR HUMIDITY

ENGINE CODE COLT98

TEST NUMBER	55.1	56.1	57.1	58.1	59.1	60.1
TEST DATE	8/ 3/76	8/ 3/76	8/ 3/76	8/ 3/76	8/ 3/76	8/ 3/76
FUEL CODE	7619	7619	7619	7619	7619	7619
BAROMETER, MMHG	751.5	751.5	751.5	747.8	747.8	747.8
HUMIDITY, GRAINS/LB	62	62	62	60	62	60
TEMPERATURE, F	92	89	89	88	89	93
ENGINE SPEED, RPM	4000	4000	4000	4000	4500	4500
TORQUE, FT-LB	38.0	19.0	7.0	2.4	73.0	64.0
POWER, BHP*	29.0	14.4	5.3	1.8	62.7	55.2
FUEL RATE, LB/HR	16.6	11.0	9.1	8.1	33.4	29.9
IGNITION TIMING, DEG BTDC	20.0	24.0	17.5	18.0	19.5	19.0
MANIFOLD VACUUM, IN HG	8.8	14.2	16.6	17.8	2.0	2.5
THROTTLE ANGLE, DEG	36.0	28.0	17.0	13.0	74.0	66.0
INTAKE MAN. TEMP., F	131	138	146	156	110	118
CONCENTRATIONS, DRY BASIS						
CO, %	.1132	.1084	.0988	.0844	2.1900	1.0880
CO2, %	11.55	9.99	9.50	9.31	13.27	13.67
O2, %	4.60	7.00	7.75	8.10	.20	.63
HC, PPMC	62	176	148	110	207	72
NOX, PPM	890	460	210	95	890	1050
AIR/FUEL RATIO	18.65	21.53	22.64	23.19	13.99	14.77
EMISSION RATES, G/HR						
CO	145.0	106.7	84.9	65.9	4183.7	1959.7
HC	4.0	8.7	6.4	4.3	19.9	6.5
NOX+	176.5	70.1	27.9	11.4	263.7	291.2
OIL TEMPERATURE, F	233	227	224	221	228	237
OIL PRESSURE, PSI	61	62	63	64	62	61
COOLANT TEMPERATURE, F	183	182	184	183	186	183
EXHAUST PRESSURE, IN. H2O	34.0	17.0	10.0	9.0	95.0	86.0
EXHAUST TEMPERATURE, F	1349	1155	1091	1111	1686	1672

* CORRECTED SAE J816B
\+ CORRECTED FOR HUMIDITY

ENGINE CODE COLT98

TEST NUMBER	61.1	63.1	64.1	65.1	66.1	67.1
TEST DATE	8/ 3/76	8/ 3/76	8/ 3/76	8/ 3/76	8/ 4/76	8/ 4/76
FUEL CODE	7619	7619	7619	7619	7619	7619
BAROMETER, MMHG	748.3	747.3	747.3	747.8	747.3	747.3
HUMIDITY, GRAINS/LB	60	60	60	70	67	67
TEMPERATURE, F	91	89	90	110	108	86
ENGINE SPEED, RPM	4500	4500	4500	4500	5300	5300
TORQUE, FT-LB	54.0	18.6	4.8	2.0	59.0	53.0
POWER, BHP*	46.4	16.0	4.1	1.8	60.8	53.6
FUEL RATE, LB/HR	27.8	13.1	9.6	9.1	36.0	33.3
IGNITION TIMING, DEG BTDC	20.0	32.0	34.0	33.0	21.0	20.5
MANIFOLD VACUUM, IN HG	4.3	13.3	17.2	17.8	1.8	4.9
THROTTLE ANGLE, DEG	54.0	35.0	29.0	29.0	72.0	47.0
INTAKE MAN. TEMP., F	128	143	154	158	123	119
CONCENTRATIONS, DRY BASIS						
CO, %	1.2750	.1180	.1156	.0820	1.9700	.6454
CO2, %	13.67	10.50	9.99	9.31	13.27	13.53
O2, %	.55	5.85	6.75	7.80	.35	.75
HC, PPMC	55	66	88	66	201	69
NOX, PPM	600	630	470	150	970	580
AIR/FUEL RATIO	14.62	20.16	21.29	22.89	14.18	15.04
EMISSION RATES, G/HR						
CO	2116.4	129.3	98.2	71.1	4108.2	1324.0
HC	4.6	3.7	3.8	2.9	21.0	7.1
NOX+	153.3	106.3	61.5	20.9	320.6	188.6
OIL TEMPERATURE, F	233	232	228	226	251	208
OIL PRESSURE, PSI	61	62	63	64	70	70
COOLANT TEMPERATURE, F	182	178	176	179	185	184
EXHAUST PRESSURE, IN. H2O	70.0	21.0	11.0	9.0	79.0	64.0
EXHAUST TEMPERATURE, F	1686	1248	1141	1128	1686	1666

* CORRECTED SAE J816B
\+ CORRECTED FOR HUMIDITY

ENGINE CODE COLT98

TEST NUMBER	68.1	69.1	70.1	71.1	72.1	80.1
TEST DATE	8/ 4/76	8/ 4/76	8/ 4/76	8/ 4/76	8/ 4/76	8/ 2/76
FUEL CODE	7619	7619	7619	7619	7619	7619
BAROMETER, MMHG	747.3	747.3	747.3	747.3	747.3	744.8
HUMIDITY, GRAINS/LB	67	67	67	67	67	65
TEMPERATURE, F	88	88	87	86	87	87
ENGINE SPEED, RPM	5300	5300	5300	5300	5300	1000
TORQUE, FT-LB	44.0	30.0	14.0	5.0	1.8	50.0
POWER, BHP*	44.6	30.4	14.2	5.1	1.8	9.6
FUEL RATE, LB/HR	26.6	21.6	16.2	11.7	10.8	5.4
IGNITION TIMING, DEG BTDC	20.5	21.0	22.0	21.5	27.0	1.0
MANIFOLD VACUUM, IN HG	5.9	7.8	9.7	12.6	12.9	3.0
THROTTLE ANGLE, DEG	37.0	32.0	30.0	25.5	24.0	24.0
INTAKE MAN. TEMP., F	128	130	132	138	147	134
CONCENTRATIONS, DRY BASIS						
CO, %	.6276	.1420	.1156	.1084	.0964	.9984
CO2, %	13.00	11.78	10.40	9.50	9.31	11.55
O2, %	1.75	4.85	6.25	7.25	7.75	4.15
HC, PPMC	19	24	89	99	99	337
NOX, PPM	650	900	690	320	255	880
AIR/FUEL RATIO	15.79	18.76	20.59	22.13	22.82	17.51
EMISSION RATES, G/HR						
CO	1079.8	237.5	159.8	117.6	98.9	387.3
HC	1.7	2.0	6.1	5.4	5.1	6.6
NOX+	177.2	238.5	151.1	55.0	41.5	53.8
OIL TEMPERATURE, F	239	230	219	220	224	175
OIL PRESSURE, PSI	70	70	70	70	70	21
COOLANT TEMPERATURE, F	183	183	174	181	181	184
EXHAUST PRESSURE, IN. H2O	60.0	44.0	31.0	22.0	18.0	7.0
EXHAUST TEMPERATURE, F	1646	1450	1214	1135	1132	885

* CORRECTED SAE J816B
\+ CORRECTED FOR HUMIDITY

ENGINE CODE COLT98

TEST NUMBER	81.1	82.1	83.1	84.1	85.1	86.1
TEST DATE	8/ 2/76	8/ 2/76	8/ 4/76	8/ 4/76	8/ 3/76	8/ 4/76
FUEL CODE	7619	7619	7619	7619	7619	7619
BAROMETER, MMHG	744.8	744.8	744.8	744.8	744.8	744.8
HUMIDITY, GRAINS/LB	65	65	65	65	65	65
TEMPERATURE, F	87	87	86	86	86	86
ENGINE SPEED, RPM	1000	1000	1000	1500	1500	1500
TORQUE, FT-LB	35.0	13.6	.4	61.4	39.0	17.0
POWER, BHP*	6.7	2.6	.1	17.6	11.2	4.9
FUEL RATE, LB/HR	4.3	3.4	2.9	8.1	6.4	4.8
IGNITION TIMING, DEG BTDC	1.0	-4.0	-6.0	8.0	8.0	5.0
MANIFOLD VACUUM, IN HG	7.0	11.0	10.5	2.3	5.6	11.8
THROTTLE ANGLE, DEG	15.0	10.0	7.0	34.0	21.0	14.0
INTAKE MAN. TEMP., F	142	151	166	136	148	161
CONCENTRATIONS, DRY BASIS						
CO, %	.5584	.2724	.1420	.2789	.4750	.1560
CO2, %	11.21	11.11	10.09	10.90	10.60	10.09
O2, %	5.05	5.50	6.50	5.00	5.50	6.50
HC, PPMC	436	301	464	779	467	128
NOX, PPM	420	128	22	430	250	100
AIR/FUEL RATIO	18.66	19.35	20.86	18.92	19.33	20.91
EMISSION RATES, G/HR						
CO	186.6	74.4	35.5	178.2	244.9	64.8
HC	7.3	4.1	5.8	25.0	12.1	2.7
NOX+	22.1	5.5	.9	43.3	20.3	6.5
OIL TEMPERATURE, F	182	180	182	185	194	190
OIL PRESSURE, PSI	20	21	21	30	30	31
COOLANT TEMPERATURE, F	182	181	175	180	178	179
EXHAUST PRESSURE, IN. H2O	5.0	4.0	1.0	10.0	8.0	5.0
EXHAUST TEMPERATURE, F	798	812	814	1032	984	927

* CORRECTED SAE J8168
\+ CORRECTED FOR HUMIDITY

ENGINE CODE COLT98

TEST NUMBER	87.1	88.1	89.1	90.1	91.1	92.1
TEST DATE	8/ 4/76	8/ 4/76	8/ 4/76	8/ 4/76	8/ 4/76	8/ 4/76
FUEL CODE	7619	7619	7619	7619	7619	7619
BAROMETER, MMHG	744.8	742.8	742.8	742.8	742.8	742.5
HUMIDITY, GRAINS/LB	65	67	67	66	66	66
TEMPERATURE, F	86	86	86	86	86	86
ENGINE SPEED, RPM	1500	2000	2000	2000	2000	2500
TORQUE, FT-LB	.6	65.0	44.0	16.0	.8	69.0
POWER, BHP*	.2	25.0	16.9	6.1	.3	33.1
FUEL RATE, LB/HR	3.5	11.3	9.0	5.8	4.3	15.4
IGNITION TIMING, DEG BTDC	1.0	11.0	12.0	12.0	11.0	14.0
MANIFOLD VACUUM, IN HG	16.4	2.1	6.2	13.2	17.3	2.5
THROTTLE ANGLE, DEG	9.0	41.0	26.0	16.0	11.0	44.0
INTAKE MAN. TEMP., F	181	129	143	160	179	126
CONCENTRATIONS, DRY BASIS						
CO, %	.1672	.2015	.3500	.1232	.1013	1.0160
CO2, %	9.31	11.66	11.22	10.50	9.31	12.75
O2, %	7.00	3.85	4.50	6.00	7.75	2.00
HC, PPMC	126	459	262	155	131	176
NOX, PPM	23	1425	500	120	45	1075
AIR/FUEL RATIO	21.92	17.87	18.41	20.25	22.79	15.76
EMISSION RATES, G/HR						
CO	53.5	167.7	240.0	60.3	41.9	1010.8
HC	2.0	19.2	9.0	3.8	2.7	8.8
NOX+	1.2	188.4	54.5	9.3	2.9	168.7
OIL TEMPERATURE, F	188	199	202	199	196	197
OIL PRESSURE, PSI	28	42	42	44	45	55
COOLANT TEMPERATURE, F	177	181	180	178	177	183
EXHAUST PRESSURE, IN. H2O	3.0	18.0	13.0	5.0	2.0	27.0
EXHAUST TEMPERATURE, F	873	1162	1142	1018	971	1330

* CORRECTED SAE J816B
\+ CORRECTED FOR HUMIDITY

ENGINE CODE COLT98

TEST NUMBER	93.1	94.1	95.1	96.1	97.1	98.1
TEST DATE	8/ 4/76	8/ 4/76	8/ 4/76	8/ 4/76	8/ 4/76	8/ 4/76
FUEL CODE	7619	7619	7619	7619	7619	7619
BAROMETER, MMHG	742.5	742.5	742.5	742.5	742.5	742.5
HUMIDITY, GRAINS/LB	66	66	66	66	66	66
TEMPERATURE, F	87	86	86	87	87	86
ENGINE SPEED, RPM	2500	2500	2500	3000	3000	3000
TORQUE, FT-LB	45.8	18.6	.8	65.6	42.4	17.6
POWER, BHP*	22.0	8.9	.4	37.8	24.4	10.1
FUEL RATE, LB/HR	11.6	7.3	5.4	17.9	13.5	8.4
IGNITION TIMING, DEG BTDC	14.0	19.0	10.0	15.0	15.0	22.0
MANIFOLD VACUUM, IN HG	5.8	13.0	17.2	3.0	6.6	13.7
THROTTLE ANGLE, DEG	32.0	19.0	14.0	45.0	32.0	16.0
INTAKE MAN. TEMP., F	139	158	172	132	140	153
CONCENTRATIONS, DRY BASIS						
CO, %	.2750	.1785	.0900	.6125	.2750	.1560
CO2, %	11.78	10.30	9.50	13.01	12.01	10.09
O2, %	4.00	6.50	7.75	2.75	3.75	6.75
HC, PPMC	151	210	88	45	84	188
NOX, PPM	750	100	50	950	750	260
AIR/FUEL RATIO	17.93	20.75	22.66	16.52	17.68	21.15
EMISSION RATES, G/HR						
CO	236.3	111.8	46.1	741.7	271.3	115.2
HC	6.5	6.6	2.3	2.8	4.2	7.0
NOX+	101.6	9.9	4.0	181.4	116.7	30.3
OIL TEMPERATURE, F	208	201	196	215	211	207
OIL PRESSURE, PSI	51	57	57	59	60	61
COOLANT TEMPERATURE, F	181	179	177	182	182	179
EXHAUST PRESSURE, IN. H2O	20.0	10.0	4.0	31.0	23.0	11.0
EXHAUST TEMPERATURE, F	1243	1050	1001	1432	1279	1068

* CORRECTED SAE J816B
\+ CORRECTED FOR HUMIDITY

ENGINE CODE COLT98

TEST NUMBER	99.1	100.1	101.1	102.1	103.1	104.1
TEST DATE	8/ 4/76	8/ 5/76	8/ 5/76	8/ 5/76	8/ 5/76	8/ 5/76
FUEL CODE	7619	7619	7619	7619	7619	7619
BAROMETER, MMHG	742.5	741.6	741.6	741.6	741.6	741.6
HUMIDITY, GRAINS/LB	66	67	67	67	67	67
TEMPERATURE, F	86	86	89	87	86	88
ENGINE SPEED, RPM	3000	3600	3600	3600	3600	4000
TORQUE, FT-LB	.6	67.0	45.0	18.0	1.4	66.4
POWER, BHP*	.3	46.4	31.2	12.5	1.0	51.2
FUEL RATE, LB/HR	6.5	23.6	17.3	10.1	7.0	26.7
IGNITION TIMING, DEG BTDC	16.0	17.0	19.5	30.0	31.0	18.0
MANIFOLD VACUUM, IN HG	16.6	2.9	5.1	14.7	16.6	2.5
THROTTLE ANGLE, DEG	14.0	40.0	32.0	18.0	16.0	49.0
INTAKE MAN. TEMP., F	171	121	138	153	174	126
CONCENTRATIONS, DRY BASIS						
CO, %	.0900	1.4200	.1769	.1277	.0892	1.4900
CO2, %	9.50	13.67	12.26	10.30	9.50	13.66
O2, %	7.60	.60	3.80	7.00	8.20	.70
HC, PPMC	104	80	51	188	110	95
NOX, PPM	54	825	890	400	80	930
AIR/FUEL RATIO	22.50	14.59	17.74	21.30	23.12	14.63
EMISSION RATES, G/HR						
CO	55.2	1994.6	223.0	114.2	60.5	2377.4
HC	3.2	5.7	3.2	8.4	3.7	7.6
NOX+	5.2	184.2	178.3	56.9	8.6	235.9
OIL TEMPERATURE, F	201	197	224	219	212	226
OIL PRESSURE, PSI	62	65	60	61	64	61
COOLANT TEMPERATURE, F	180	184	183	179	179	185
EXHAUST PRESSURE, IN. H2O	8.0	45.0	35.0	11.0	6.0	65.0
EXHAUST TEMPERATURE, F	1065	1545	1389	1135	1080	1626

* CORRECTED SAE J8168
\+ CORRECTED FOR HUMIDITY

ENGINE CODE COLT98

TEST NUMBER	105.1	106.1	107.1	108.1	109.1	110.1
TEST DATE	8/ 5/76	8/ 5/76	8/ 5/76	8/ 5/76	8/ 5/76	8/ 5/76
FUEL CODE	7619	7619	7619	7619	7619	7619
BAROMETER, MMHG	741.6	741.6	741.6	741.6	741.6	741.6
HUMIDITY, GRAINS/LB	67	67	67	67	67	67
TEMPERATURE, F	89	88	88	89	91	88
ENGINE SPEED, RPM	4000	4000	4000	4500	4500	4500
TORQUE, FT-LB	45.0	19.0	2.6	65.0	43.0	18.0
POWER, BHP*	34.7	14.6	2.0	56.4	37.4	15.6
FUEL RATE, LB/HR	18.7	12.5	7.9	29.2	22.2	13.2
IGNITION TIMING, DEG BTDC	18.0	23.0	25.0	20.0	20.0	23.0
MANIFOLD VACUUM, IN HG	5.8	11.8	17.4	2.3	6.1	12.9
THROTTLE ANGLE, DEG	38.0	36.0	21.0	53.0	41.0	27.0
INTAKE MAN. TEMP., F	141	138	167	123	138	146
CONCENTRATIONS, DRY BASIS						
CO, %	.1465	.1325	.0820	1.0100	.2875	.1180
CO2, %	12.40	10.70	9.40	13.53	13.14	10.40
O2, %	3.65	6.30	8.10	1.05	2.40	6.75
HC, PPMC	316	131	93	57	14	100
NOX, PPM	770	510	95	1100	725	510
AIR/FUEL RATIO	17.58	20.44	23.12	15.09	16.45	21.04
EMISSION RATES, G/HR						
CO	198.3	139.9	62.4	1820.7	431.0	135.6
HC	21.5	6.9	3.6	5.2	1.0	5.7
NOX+	165.7	85.6	11.5	315.2	172.8	93.2
OIL TEMPERATURE, F	231	201	221	226	239	216
OIL PRESSURE, PSI	60	65	63	62	60	64
COOLANT TEMPERATURE, F	183	182	181	185	182	183
EXHAUST PRESSURE, IN. H2O	42.0	19.0	8.0	80.0	55.0	22.0
EXHAUST TEMPERATURE, F	1467	1165	1111	1622	1568	1242

* CORRECTED SAE J8168
\+ CORRECTED FOR HUMIDITY

ENGINE CODE COLT98

TEST NUMBER	112.1	113.1	114.1	115.1	133.1	156.1
TEST DATE	8/ 5/76	8/ 5/76	8/ 5/76	8/ 5/76	8/24/76	10/ 8/76
FUEL CODE	7619	7619	7619	7619	7619	7619
BAROMETER, MMHG	741.6	741.6	741.6	741.6	745.0	750.0
HUMIDITY, GRAINS/LB	67	67	67	67	59	48
TEMPERATURE, F	90	91	91	91	88	82
ENGINE SPEED, RPM	5300	5300	5300	5300	5500	1000
TORQUE, FT-LB	53.0	35.0	14.0	1.2	63.0	-6.0
POWER, BHP*	54.2	35.8	14.3	1.2	66.3	1.1
FUEL RATE, LB/HR	29.8	24.4	15.0	11.0	37.6	2.3
IGNITION TIMING, DEG BTDC	22.0	23.5	25.0	26.0	24.0	-6.0
MANIFOLD VACUUM, IN HG	2.4	7.4	12.6	16.4	3.0	16.0
THROTTLE ANGLE, DEG	56.0	42.0	33.0	26.0	71.0	.0
INTAKE MAN. TEMP., F	121	134	143	149	121	188
CONCENTRATIONS, DRY BASIS						
CO, %	.8514	.4608	.1084	.0940	3.1500	.2480
CO2, %	13.53	12.88	10.30	9.50	13.26	9.70
O2, %	.77	2.30	6.75	7.90	.10	7.25
HC, PPMC	74	17	88	104	312	3302
NOX, PPM	580	700	630	260	1000	10
AIR/FUEL RATIO	14.96	16.30	21.12	22.81	13.57	21.10
EMISSION RATES, G/HR						
CO	1552.1	753.5	142.4	98.8	6550.6	49.9
HC	6.8	1.4	5.8	5.5	32.6	33.4
NOX+	168.1	182.0	131.6	43.5	318.9	.3
OIL TEMPERATURE, F	224	235	244	231	245	167
OIL PRESSURE, PSI	64	60	60	62	58	25
COOLANT TEMPERATURE, F	186	186	172	183	187	172
EXHAUST PRESSURE, IN. H2O	96.0	64.0	30.0	16.0	109.0	3.0
EXHAUST TEMPERATURE, F	1624	1578	1271	1150	1678	740

* CORRECTED SAE J816B
\+ CORRECTED FOR HUMIDITY

ENGINE CODE COLT98

TEST NUMBER	157.1	158.1
TEST DATE	10/ 8/76	10/ 8/76
FUEL CODE	7619	7619
BAROMETER, MMHG	750.0	750.0
HUMIDITY, GRAINS/LB	48	48
TEMPERATURE, F	82	82
ENGINE SPEED, RPM	1500	2000
TORQUE, FT-LB	-13.0	-16.5
POWER, BHP*	3.7	6.2
FUEL RATE, LB/HR	2.2	2.3
IGNITION TIMING, DEG BTDC	1.0	4.0
MANIFOLD VACUUM, IN HG	20.2	22.5
THROTTLE ANGLE, DEG	.0	.0
INTAKE MAN. TEMP., F	195	178
CONCENTRATIONS, DRY BASIS		
CO, %	.2205	.2635
CO2, %	6.98	4.40
O2, %	12.50	14.70
HC, PPMC	10727	10466
NOX, PPM	10	7
AIR/FUEL RATIO	27.54	37.05
EMISSION RATES, G/HR		
CO	57.2	97.6
HC	139.9	194.6
NOX+	.4	.4
OIL TEMPERATURE, F	177	181
OIL PRESSURE, PSI	39	54
COOLANT TEMPERATURE, F	179	178
EXHAUST PRESSURE, IN. H2O	2.0	3.0
EXHAUST TEMPERATURE, F	685	567

* CORRECTED SAE J816B
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