REPORT NO. DOT-TSC-OST-77-51

MASTER

PERFORMANCE CHARACTERISTICS OF
AUTOMOTIVE ENGINES IN THE UNITED STATES :

Report No. 11-- Chrysler (1975) 318-CID 2-bbl Engine

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PREFACE

This report, prepared by the Energy Research and Development Administration, 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 United States. The engine used in this work is one of a series of 23 engines to be tested in the current program.

Mr. Ralph G. Colello, Department of Transportation, is the technical monitor for this project.

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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
m ²	square meters	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

This report presents data acquired from a 1975 Chrysler 318-CID, 2-bbl engine. Chrysler uses this engine in a variety of its intermediate and full size vehicles. The test results are sufficient to establish steady-state maps for fuel consumption and emission levels over the entire operating range of the engine.

The objective of this program is to obtain 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 Chrysler 318-CID, 2V engine are listed in table 1. The engine breakin and tests were run using a single batch of unleaded regular fuel; the fuel analysis is given in table 2.

The engine was mounted on a test stand and coupled to an eddy-current dynamometer. Engine cooling was provided through the use of a cooling tower instead of a radiator, and the fan was not included in the test setup. The engine was equipped with an alternator, but it was not wired into the engine's electrical circuit. The operative emission control systems included exhaust-gas recirculation (EGR) and a catalytic converter.

The engine was operated at various speeds and loads designed to approximate road-load conditions over a 50 hour period for breakin. Details of the breakin schedule are given in table 3. The engine tests began on Nov. 20, 1975, and ended on Dec. 13, 1975, yielding a total engine operating time of approximately 120 hours. The engine was tested while operating at the following steady-state modes:

Low engine speeds: 1,200; 1,500; 2,000 rpm

Low engine speed loads: 0, 5, 10, 25, 40, 60, 75, 90, 100 pct
of full load (repeated at each load
except 100 pct)

High engine speed: 2,500, 3,000; 3,500, 4,000 rpm

High engine speed loads: 0, 5, 10, 25, 40, 60, 75, 90, 100 pct
of full load (repeated at 0, 5, 10,
25, 40, and 60 pct of full load except
for 4,000 rpm)

Idle-speed loads: 0, 2, 3, 4 bhp (repeated at 0 bhp)

Total number of test modes.....	69
Repeats.....	43
Total number of tests.....	112.

The following data were recorded for each test:

Test number
Date
Barometric pressure, mm Hg
Dew point, °F
Inlet air temperature, °F

Speed, rpm
 Torque, lb-ft -- BLH starin gauge load cell; Daytronics indicator
 Fuel rate, lb/hr -- Fluidyne positive displacement fuel flow meter
 Ignition timing, °BTC
 Manifold vacuum, in. Hg
 Throttle angle, degrees
 CO, pct -- Beckman NDIR
 CO₂, pct -- Beckman NDIR
 O₂, pct -- Beckman polarographic detector
 HC, ppmC -- Custom-built, heated, flame-ionization detector
 NO_x, ppm -- Thermo-Electron chemiluminescent detector
 Oil temperature, °F
 Oil pressure, psig
 Coolant temperature, °F
 Exhaust temperature, °F
 Exhaust pressure, in. H₂O
 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_x) in grams/hour. The following equations were applied in the computations:

$$W = \exp \left[12.02 \left(\frac{D - 1.4}{D + 212} \right) \right] , \quad (1)$$

$$H = \frac{4348 W}{B - W} , \quad (2)$$

$$P = \left(\frac{N \times T}{5252} \right) \left(\frac{736.6}{B - W} \right) \left(\frac{t + 460}{545} \right)^{0.5} , \quad (3)$$

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

The equation for A/F is based on:

1. Fuel = CH_{2.099}
2. Water-gas-shift equilibrium constant = $\frac{(CO) (H_2O)}{(CO_2) (H_2)} = 3$
3. HC was determined on a raw exhaust, wet basis, all other species were measured on a dry basis.
4. All NO_x is NO.

$$\text{Mass CO} = (\text{Exhaust flow rate}) \times (\text{CO}) \times \frac{\text{Mol. wt CO}}{\text{Mol. wt exhaust}}$$

x correction for water removal,

$$\text{Mass CO} = 4.383 (F) (A/F + 1) (\text{CO}) \left[\frac{1}{1 + 0.03148(\text{CO}_2) \left(\frac{\text{CO} + \text{CO}_2}{\text{CO} + 3\text{CO}_2} \right)} \right] , \quad (5)$$

$$\text{Mass HC} = 0.0002207 (F) (A/F + 1) (\text{HC}) , \quad (6)$$

$$\text{Mass NO}_x = 0.0007201 (F) (A/F + 1) (\text{NO}_x) \left[\frac{1}{1 + 0.03148(\text{CO}_2) \left(\frac{\text{CO} + \text{CO}_2}{\text{CO} + 3\text{CO}_2} \right)} \right] \times K_H , \quad (7)$$

$$K_H = \frac{1}{1 - 0.0047 (H - 75)} , \quad (8)$$

where A/F = air-fuel ratio

B = barometric pressure, mm Hg

CO = carbon monoxide concentration, pct, vol

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

HC = unburned hydrocarbon concentration, ppmC, vol

K_H = humidity correction factor

N = engine speed, rpm

NO = nitric oxide concentration, ppm, vol

NO_x = nitrogen oxides concentration, ppm, vol

O_2 = concentration, vol pct

P = corrected power, brake horsepower

t = intake air temperature, °F

T = torque, ft-lb

W = water vapor pressure, mm Hg.

TABLE 1. - GENERAL ENGINE SPECIFICATIONS

Displacement, cubic inches.....	318
Maximum brake horsepower, bhp @ 4,000 rpm.....	150
Maximum torque, lb-ft @ 1,600 rpm.....	255
Bore and stroke, inches.....	3.91 x 3.31
Configuration.....	90° V, 8 cylinder
Compression ratio.....	8.6
Firing order.....	1-8-4-3-6-5-7-2
Ignition timing at idle speed, °BTC at 750 rpm.....	2
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.....	Chain
Valve port size:	
Intake, inches.....	1.78
Exhaust, inches.....	1.50
Valve timing:	
Intake opens, °BTC.....	10
Intake closes, °ABC.....	50
Exhaust opens, °BBC.....	52
Exhaust closes, °ATC.....	16
Valve lift (zero lash):	
Intake, inches.....	0.373
Exhaust, inches.....	0.400
Spark plug gap, inches.....	0.033
Engine weight, lb.....	630
Exhaust-gas recirculation system:	
Valve type.....	Poppet
Control signal.....	Ported manifold vacuum
Point of discharge.....	Intake manifold
Crankcase emission control:	
Control method.....	Positive crankcase ventilation
Point of discharge.....	Breather
Carburetor type.....	2V, downdraft
Distributor specifications:	
Centrifugal advance, begins, ° @ 550 rpm.....	3.5
Centrifugal advance, intermediate, ° @ 700 rpm...	6.75
Centrifugal advance, maximum, ° @ 2,200 rpm.....	12.75
Vacuum advance, begins, ° @ 7 in. Hg.....	1.50
Vacuum advance, maximum, ° @ 12 in. Hg.....	11
Carburetor number.....	1565581
EGR valve number.....	3769191
Distributor number.....	3874090

TABLE 2. - FUEL SPECIFICATIONS

Fuel No.....	7516
Research octane No.....	91.0
Motor octane No.....	83.5
Reid vapor pressure, psig.....	9.86
(by micro vapor pressure test)	
Distillation, °F:	
10 pct.....	125
50 pct.....	212
95 pct.....	390
100 pct.....	416
API gravity, degrees.....	66.1
FIA analysis, pct:	
Aromatics.....	11
Olefins.....	15
Paraffins.....	74
Sulfur, pct.....	0.0288
Lead, grams per gallon.....	Trace

TABLE 3. - ENGINE BREAKIN SCHEDULE

Simulated vehicle speed, mph	Engine speed, rpm	Manifold vacuum, in. Hg	Fraction of time in mode, hr
20	900	13.5	1/8
30	1,300	14.0	"
40	1,475	15.0	"
50	1,850	15.5	"
25	1,050	15.0	"
35	1,550	13.5	"
45	1,800	12.5	"
55	2,250	10.0	"

Time per cycle = 2 hours.

Mileage per cycle = 75 miles.

Total mileage accumulated after the 50 hour breakin period = 1,500 miles.

3. DISCUSSION OF TEST RESULTS

Engine performance, emission, and fuel consumption data show good repeatability. Wide-open throttle (WOT) performance (figure 1) results show peak, brake horsepower, and torque values in excess of those quoted in table 1. The minimum brake specific fuel consumption (bsfc) values at WOT are found at nearly the same engine speed as the maximum torque. Air-fuel ratio was maintained at nearly a constant value except near WOT conditions (figure 2). Emissions of carbon monoxide (CO) and unburned hydrocarbons (HC) were well-controlled at all modes associated with slightly lean air-fuel ratio operation as a result of the catalytic reactor (figures 3 and 4). Maximum levels of nitric oxides emission occurred typically at 90 pct of full load; this could be associated with the deactivation of the EGR system and an air-fuel ratio near stoichiometric (figure 5). Fuel consumption was found to be nearly a linear function of power except for low engine speeds (figure 6).

4. CONCLUSIONS

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

FIGURE 1. - BRAKE SPECIFIC FUEL CONSUMPTION, TORQUE AND BRAKE HORSEPOWER VERSUS ENGINE RPM AT WIDE-OPEN-THROTTLE--CHRYSLER 318-CID, 2-BBL ENGINE.

FIGURE 2. - AIR-FUEL RATIO VERSUS POWER AT SEVERAL SPEEDS--CHRYSLER 318-CID ENGINE.

FIGURE 3. - CARBON MONOXIDE EMISSIONS VERSUS POWER AT SEVERAL SPEEDS--CHRYSLER 318-CID ENGINE.

FIGURE 4. - HYDROCARBON EMISSIONS VERSUS POWER AT SEVERAL SPEEDS--CHRYSLER 318-CID ENGINE.

FIGURE 5. - OXIDES OF NITROGEN EMISSIONS VERSUS POWER AT SEVERAL SPEEDS--CHRYSLER 318-CID ENGINE.

FIGURE 6. - FUEL RATE VERSUS POWER AT SEVERAL SPEEDS--CHRYSLER 318-CID ENGINE.

Engine..... Chrysler 318-CID
 Fuel..... 7516

Test Number.....	1	2	3	4	5
Test Date.....	12/13/75	12/13/75	12/13/75	11/20/75	12/ 6/75
Barometer, mm Hg.....	744.8	744.8	744.8	742.0	755.9
Humidity, grains/lb.....	57	57	57	62	50
Temperature, F.....	62	62	62	59	39
Engine speed, rpm.....	750	650	650	650	1200
Torque, lb-ft.....	0.0	18.0	25.0	32.0	201.0
Power, bhp*.....	0.0	2.2	3.0	3.9	45.2
Fuel rate, lb/hr.....	4.6	4.3	4.6	5.2	20.2
Ignition timing, deg BTC....	2.0	2.0	2.0	2.0	19.0
Manifold vacuum, in Hg.....	19.8	18.0	17.0	15.4	2.0
Throttle angle, deg.....	0.0	0.0	0.0	0.0	17.0
<u>Before Catalyst</u>					
Concentrations, dry basis:					
CO, %.....	.4100	.4100	.5550	.7250	.0530
CO2, %.....	13.95	13.00	12.35	12.70	13.30
O2, %.....	1.10	2.50	2.35	2.00	2.27
HC, ppmC.....	1207	1025	1309	1309	1168
NOx, ppm.....	62	75	38	155	4850
Air-fuel ratio.....	15.36	16.43	16.58	16.60	16.60
Emission rates, g/hr:					
CO.....	117.7	118.1	171.5	254.0	72.5
HC.....	17.5	14.9	20.4	23.1	30.6
NOx**.....	2.7	3.3	4.1	8.4	898.6
Oil temperature, F.....	204	211	211	214	234
Oil pressure, psi.....	37	30	29	30	43
Coolant temperature, F.....	189	189	188	189	190
Exhaust temperature, F.....	604	558	537	642	996
Exhaust pressure, in H2O....	1.6	1.3	1.5	1.5	45.0
<u>After Catalyst</u>					
Concentrations, dry basis:					
CO, %.....	.3750	.4100	.4100	.0223	.0050
CO2, %.....	13.95	12.35	12.70	13.60	13.30
O2, %.....	1.15	2.50	2.75	2.70	2.15
HC, ppmC.....	1206	1081	1136	137	108
NOx, ppm.....	65	92	103	140	4550
Air-fuel ratio.....	15.41	16.44	16.63	16.85	16.66
Emission rates, g/hr:					
CO.....	103.0	118.3	127.4	7.9	6.9
HC.....	17.5	15.7	17.3	2.4	7.5
NOx**.....	2.8	4.0	5.1	7.7	846.3
Exhaust temperature, F.....	554	444	425	650	913
Exhaust pressure, in H2O....	.5	1.0	1.0	1.0	10.0

* Corrected - SAE J815b

** Corrected for humidity.

Engine..... Chrysler 318-CID
 Fuel..... 7516

Test Number.....	6	7	8	9	10
Test Date.....	12/ 6/75	12/ 6/75	12/ 6/75	12/ 6/75	12/ 6/75
Barometer, mm Hg.....	755.9	755.9	755.9	755.9	755.9
Humidity, grains/lb.....	30	30	30	30	30
Temperature, F.....	89	93	92	93	94
Engine speed, rpm.....	1200	1200	1200	1200	1200
Torque, lb-ft.....	180.0	155.0	90.0	45.0	23.0
Power, bhp*.....	40.5	30.5	20.3	10.2	5.2
Fuel rate, lb/hr.....	18.4	14.5	10.7	7.4	6.4
Ignition timing, deg BTC....	19.0	26.0	42.0	42.0	21.0
Manifold vacuum, in Hg.....	3.0	3.0	14.0	19.2	20.5
Throttle angle, deg.....	14.0	8.0	4.0	2.0	1.5
<u>Before Catalyst</u>					
Concentrations, dry basis:					
CO, %.....	.6050	.0630	.0600	.3970	.3400
CO2, %.....	12.85	12.70	13.00	13.60	13.30
O2, %.....	2.82	2.87	2.45	1.30	1.83
HC, ppmC.....	1048	1275	1563	1718	959
NOx, ppm.....	3200	1813	3400	2025	295
Air-fuel ratio.....	16.67	17.00	16.66	15.53	15.97
Emission rates, g/hr:					
CO.....	755.0	63.7	43.8	185.0	142.7
HC.....	65.9	65.0	57.5	40.4	20.3
NOx**.....	540.9	248.3	336.4	127.8	16.8
Oil temperature, F.....	236	233	232	232	229
Oil pressure, psi.....	41	44	44	47	50
Coolant temperature, F.....	90	188	188	186	186
Exhaust temperature, F.....	1006	945	830	750	725
Exhaust pressure, in H2O....	39.0	27.0	8.0	4.0	3.0
<u>After Catalyst</u>					
Concentrations, dry basis:					
CO, %.....	.0046	.0044	.0041	.0129	.0089
CO2, %.....	13.00	13.00	13.15	14.25	13.75
O2, %.....	2.77	2.70	2.18	.83	1.55
HC, ppmC.....	89	93	105	121	79
NOx, ppm.....	3000	1650	3000	1588	330
Air-fuel ratio.....	17.11	17.01	16.65	15.53	16.03
Emission rates, g/hr:					
CO.....	5.9	4.4	3.0	6.0	3.7
HC.....	5.8	4.7	3.8	2.8	1.7
NOx**.....	521.0	225.7	296.2	99.9	18.8
Exhaust temperature, F.....	916	851	749	708	639
Exhaust pressure, in H2O....	5.0	2.2	.6	.2	.1

* Corrected - SAE J816b

** Corrected for humidity.

Engine..... Chrysler 313-CID
 Fuel..... 7516

Test Number.....	11	12	13	14	15
Test Date.....	12/ 6/75	12/ 6/75	12/ 6/75	12/ 6/75	12/ 6/75
Barometer, mm Hg.....	755.9	755.9	755.9	755.9	755.9
Humidity, grains/lb.....	30	30	30	30	30
Temperature, F.....	95	102	57	58	58
Engine speed, rpm.....	1200	1200	1200	1200	1200
Torque, lb-ft.....	11.0	0.0	200.0	180.0	135.0
Power, bhp*.....	2.5	0.0	43.7	39.3	29.5
Fuel rate, lb/hr.....	5.6	5.3	19.7	18.4	15.9
Ignition timing, deg BTC....	18.0	18.0	17.0	17.0	24.0
Manifold vacuum, in Hg.....	21.0	22.0	4.0	5.0	8.0
Throttle angle, deg.....	1.0	.5	15.8	15.0	8.5
<u>Before Catalyst</u>					
Concentrations, dry basis:					
CO, %.....	.2750	.2530	.0565	.0630	.0585
CO2, %.....	13.38	13.45	13.00	12.70	12.70
O2, %.....	1.85	1.90	2.77	3.05	3.25
HC, ppmC.....	322	800	1080	1100	1247
NOx, ppm.....	175	103	3900	2900	1488
Air-fuel ratio.....	16.05	16.07	16.98	17.20	17.28
Emission rates, g/hr:					
CO.....	101.1	38.1	77.2	81.4	65.8
HC.....	15.2	14.0	74.3	71.6	70.7
NOx**.....	8.7	4.8	721.3	507.6	226.7
Oil temperature, F.....	225	225	230	228	225
Oil pressure, psi.....	53	55	43	43	50
Coolant temperature, F.....	186	186	187	186	188
Exhaust temperature, F.....	717	715	1008	1017	932
Exhaust pressure, in H2O....	2.4	1.6	40.0	27.0	11.0
<u>After Catalyst</u>					
Concentrations, dry basis:					
CO, %.....	.0082	.0075	.0440	.0440	.0032
CO2, %.....	13.60	13.75	13.00	12.85	12.70
O2, %.....	1.65	1.60	2.67	2.85	3.15
HC, ppmC.....	74	69	96	84	86
NOx, ppm.....	161	113	3700	2700	1400
Air-fuel ratio.....	16.11	16.06	17.04	17.16	17.40
Emission rates, g/hr:					
CO.....	3.0	2.6	60.3	56.7	3.6
HC.....	1.4	1.2	6.6	5.5	4.9
NOx**.....	8.1	5.3	386.4	471.0	214.8
Exhaust temperature, F.....	617	606	922	928	829
Exhaust pressure, in H2O....	0.0	0.0	3.5	2.9	.8

* Corrected - SAE J816b

** Corrected for humidity.

Engine..... Chrysler 318- CID
 Fuel..... 7516

Test Number.....	16	17	18	19	20
Test Date.....	12/ 6/75	12/ 6/75	12/ 6/75	12/ 6/75	12/ 6/75
Barometer, mm Hg.....	755.9	755.9	755.9	755.9	755.9
Humidity, grains/lb.....	30	30	30	30	30
Temperature, F.....	60	59	59	59	59
Engine speed, rpm.....	1200	1200	1200	1200	1200
Torque, lb-ft.....	90.0	45.0	25.0	11.0	0.0
Power, bhp*.....	19.7	9.8	5.0	2.4	0.0
Fuel rate, lb/hr.....	11.4	8.0	6.8	6.4	5.4
Ignition timing, deg BTC....	40.0	42.0	25.0	19.0	19.0
Manifold vacuum, in Hg.....	13.0	18.8	21.0	22.0	20.2
Throttle angle, deg.....	4.0	2.2	1.2	1.0	.5
<u>Before Catalyst</u>					
Concentrations, dry basis:					
CO, %.....	.0570	.1100	.4300	.6950	.2770
CO2, %.....	12.85	13.15	13.75	13.75	13.45
O2, %.....	2.95	2.37	1.25	1.00	1.97
HC, ppmC.....	1589	2562	1147	977	1429
NOx, ppm.....	2425	2225	380	209	110
Air-fuel ratio.....	17.02	16.39	15.48	15.19	16.04
Emission rates, g/hr:					
CO.....	45.0	58.7	184.1	274.0	97.3
HC.....	63.2	68.9	24.8	19.4	25.3
NOx**.....	259.3	160.9	22.0	11.2	5.2
Oil temperature, F.....	227	226	225	223	222
Oil pressure, psi.....	45	50	55	59	56
Coolant temperature, F.....	186	185	184	184	183
Exhaust temperature, F.....	863	779	742	742	732
Exhaust pressure, in H2O....	6.6	4.5	3.2	2.6	2.2
<u>After Catalyst</u>					
Concentrations, dry basis:					
CO, %.....	.0032	.0041	.0098	.0140	.0065
CO2, %.....	13.00	13.60	14.25	14.43	13.95
O2, %.....	2.67	2.00	.87	.77	1.57
HC, ppmC.....	97	160	98	86	115
NOx, ppm.....	2213	1825	420	170	130
Air-fuel ratio.....	17.01	16.41	15.53	15.44	16.02
Emission rates, g/hr:					
CO.....	2.5	2.2	4.2	5.6	2.3
HC.....	5.8	4.3	2.1	1.7	2.0
NOx**.....	236.2	131.7	24.4	9.2	6.2
Exhaust temperature, F.....	794	724	667	674	656
Exhaust pressure, in H2O....	0.0	0.0	0.0	0.0	0.0

* Corrected - SAE J816b

** Corrected for humidity.

Engine..... Chrysler 318-CID
 Fuel..... 7516

Test Number.....	21	22	23	24	25
Test Date.....	12/ 6/75	12/ 6/75	12/ 6/75	12/ 6/75	12/ 6/75
Barometer, mm Hg.....	755.9	755.9	755.9	755.9	755.9
Humidity, grains/lb.....	30	30	30	30	30
Temperature, F.....	61	59	58	69	73
Engine speed, rpm.....	1500	1500	1500	1500	1500
Torque, lb-ft.....	203.0	180.0	105.0	90.0	45.0
Power, bhp*.....	55.6	49.7	37.2	24.3	12.5
Fuel rate, lb/hr.....	32.1	25.2	19.0	14.3	9.3
Ignition timing, deg BTC....	19.5	19.0	22.0	38.0	42.0
Manifold vacuum, in Hg.....	3.0	4.0	6.2	12.2	13.8
Throttle angle, deg.....	26.0	20.2	12.5	6.0	3.0
<u>Before Catalyst</u>					
Concentrations, dry basis:					
CO, %.....	.0585	.0665	.0740	.0650	.0830
CO2, %.....	13.45	13.00	12.70	13.00	13.00
O2, %.....	2.10	2.85	3.35	2.85	2.75
HC, ppmC.....	970	921	850	1364	1990
NOx, ppm.....	4600	3350	1725	1925	1722
Air-fuel ratio.....	16.47	17.06	17.41	16.93	16.75
Emission rates, g/hr:					
CO.....	125.9	116.4	100.1	62.3	52.7
HC.....	105.2	81.2	58.0	63.0	63.7
NOx**.....	1340.4	936.2	316.1	257.9	148.1
Oil temperature, F.....	232	231	226	223	225
Oil pressure, psi.....	56	47	47	53	56
Coolant temperature, F.....	188	186	185	187	184
Exhaust temperature, F.....	1126	1130	1074	967	865
Exhaust pressure, in H2O....	58.0	50.0	44.0	27.0	5.2
<u>After Catalyst</u>					
Concentrations, dry basis:					
CO, %.....	.0037	.0032	.0034	.0030	.0035
CO2, %.....	13.60	13.00	12.70	13.15	13.30
O2, %.....	1.90	2.73	3.25	2.65	2.50
HC, ppmC.....	81	69	64	82	97
NOx, ppm.....	4700	3350	1600	1875	1775
Air-fuel ratio.....	16.45	17.12	17.48	16.96	16.82
Emission rates, g/hr:					
CO.....	7.9	5.6	4.6	3.0	2.2
HC.....	8.8	6.1	4.4	4.1	3.1
NOx**.....	1366.8	915.9	294.5	251.3	152.8
Exhaust temperature, F.....	1029	1041	982	390	787
Exhaust pressure, in H2O....	14.0	10.0	6.0	2.7	1.0

* Corrected - SAE J616b

** Corrected for humidity.

Engine..... Chrysler 318-CID
 Fuel..... 7516

Test Number.....	26	27	28	30	32
Test Date.....	12/ 6/75	12/ 6/75	12/ 6/75	12/ 6/75	12/ 6/75
Barometer, mm Hg.....	755.9	755.9	755.9	755.9	755.9
Humidity, grains/lb.....	30	30	30	30	30
Temperature, F.....	76	75	85	96	89
Engine speed, rpm.....	1500	1500	1500	1500	1500
Torque, lb-ft.....	23.0	11.0	0.0	180.0	90.0
Power, bhp*.....	6.4	3.1	0.0	50.9	25.3
Fuel rate, lb/hr.....	8.0	7.3	6.8	24.5	15.2
Ignition timing, deg BTC....	42.5	42.0	25.0	19.0	42.0
Manifold vacuum, in Hg.....	21.0	22.0	22.6	4.0	13.6
Throttle angle, deg.....	2.5	2.0	1.5	19.5	6.0
<u>Before Catalyst</u>					
Concentrations, dry basis:					
CO, %.....	.1750	.3570	.5300	.0580	.0670
CO2, %.....	13.30	13.15	13.95	13.30	12.85
O2, %.....	2.55	2.65	1.00	2.33	2.83
HC, ppmC.....	3422	8554	460	980	1391
NOx, ppm.....	850	470	148	4400	1488
Air-fuel ratio.....	16.31	15.70	15.29	16.65	16.91
Emission rates, g/hr:					
CO.....	93.1	167.4	244.3	96.5	70.5
HC.....	91.7	202.2	9.8	82.2	73.7
NOx**.....	61.2	29.9	8.4	991.5	212.1
Oil temperature, F.....	226	226	226	243	204
Oil pressure, psi.....	59	60	60	43	64
Coolant temperature, F.....	184	184	184	188	178
Exhaust temperature, F.....	797	740	784	1109	813
Exhaust pressure, in H2O....	3.5	3.0	2.4	50.0	11.0
<u>After Catalyst</u>					
Concentrations, dry basis:					
CO, %.....	.0053	.0093	.0405	.0056	.0034
CO2, %.....	13.60	13.95	14.60	13.45	13.00
O2, %.....	1.87	1.35	.65	2.13	2.73
HC, ppmC.....	200	378	87	37	114
NOx, ppm.....	850	470	163	4600	1150
Air-fuel ratio.....	16.28	15.84	15.34	16.64	17.01
Emission rates, g/hr:					
CO.....	2.8	4.4	17.1	9.3	3.6
HC.....	5.3	9.0	1.8	3.1	6.1
NOx**.....	61.0	30.0	9.3	1035.0	164.6
Exhaust temperature, F.....	735	778	738	1015	667
Exhaust pressure, in H2O....	.4	0.0	0.0	10.0	3.7

* Corrected - SAE J316b

** Corrected for humidity.

Engine..... Chrysler 318-CID
 Fuel..... 7516

Test Number.....	33	34	35	36	37
Test Date.....	12/ 6/75	12/ 6/75	12/ 6/75	12/ 6/75	12/ 6/75
Barometer, mm Hg.....	755.9	755.9	755.9	755.9	755.9
Humidity, grains/lb.....	30	30	30	30	30
Temperature, F.....	95	95	95	95	97
Engine speed, rpm.....	1500	1500	1500	1500	2000
Torque, lb-ft.....	45.0	23.0	11.0	0.0	202.0
Power, bhp*.....	12.7	6.5	3.1	0.0	76.3
Fuel rate, lb/hr.....	9.3	7.8	6.9	6.9	34.7
Ignition timing, deg BTC....	41.0	42.0	29.0	27.0	21.0
Manifold vacuum, in Hg.....	19.0	21.0	22.0	22.4	4.0
Throttle angle, deg.....	3.0	2.0	1.0	.5	27.5
<u>Before Catalyst</u>					
Concentrations, dry basis:					
CO, %.....	.0870	.1750	.5200	.5200	.0740
CO2, %.....	13.00	13.30	13.75	13.75	13.30
O2, %.....	2.65	2.25	1.15	1.17	2.30
HC, ppmC.....	1194	3422	976	861	644
NOx, ppm.....	1825	830	260	145	3800
Air-fuel ratio.....	16.78	16.10	15.38	15.40	16.63
Emission rates, g/hr:					
CO.....	58.2	89.1	225.0	224.0	173.9
HC.....	40.3	87.8	21.5	18.7	76.3
NOx**.....	165.4	57.2	15.2	8.5	1209.6
Oil temperature, F.....	228	231	230	232	242
Oil pressure, psi.....	60	60	60	60	60
Coolant temperature, F.....	185	185	186	188	188
Exhaust temperature, F.....	860	788	775	797	1209
Exhaust pressure, in H2O....	7.3	5.2	4.0	3.7	51.0
<u>After Catalyst</u>					
Concentrations, dry basis:					
CO, %.....	.0036	.0050	.0180	.0220	.0039
CO2, %.....	13.15	13.60	14.25	14.25	13.45
O2, %.....	2.45	1.75	.73	.70	2.10
HC, ppmC.....	83	229	86	86	63
NOx, ppm.....	1600	850	230	153	3800
Air-fuel ratio.....	16.80	16.19	15.42	15.39	16.59
Emission rates, g/hr:					
CO.....	2.4	2.6	7.8	9.5	9.1
HC.....	2.3	5.9	1.9	1.9	7.4
NOx**.....	145.0	58.8	13.5	8.9	1205.0
Exhaust temperature, F.....	775	735	700	699	1104
Exhaust pressure, in H2O....	2.2	.9	.4	.2	31.0

* Corrected - SAE J816b

** Corrected for humidity.

Engine..... Chrysler 318-CID
 Fuel..... 7515

Test Number.....	38	39	40	41	42
Test Date.....	12/ 6/75	12/ 6/75	12/ 6/75	12/ 6/75	12/ 6/75
Barometer, mm Hg.....	755.9	755.9	755.9	755.9	755.9
Humidity, grains/lb.....	30	30	30	30	30
Temperature, F.....	102	103	104	107	107
Engine speed, rpm.....	2000	2000	2000	2000	2000
Torque, lb-ft.....	180.0	155.0	90.0	45.0	23.0
Power, bhp*.....	68.3	51.3	34.2	17.1	8.8
Fuel rate, lb/hr.....	32.8	25.1	18.5	13.5	10.8
Ignition timing, deg BTC....	19.0	29.0	43.0	45.0	45.0
Manifold vacuum, in Hg.....	4.6	8.2	13.4	17.2	19.8
Throttle angle, deg.....	24.0	14.0	8.0	4.0	5.0
<u>Before Catalyst</u>					
Concentrations, dry basis:					
CO, %.....	.0840	.0805	.0770	.1305	.1455
CO2, %.....	13.30	13.00	13.00	13.00	12.70
O2, %.....	2.40	2.75	2.75	2.83	3.13
HC, ppmC.....	513	767	1046	1706	2269
NOx, ppm.....	3100	2650	2125	590	400
Air-fuel ratio.....	16.69	16.95	16.89	16.78	16.95
Emission rates, g/hr:					
CO.....	187.1	159.8	98.4	119.0	108.7
HC.....	57.6	67.2	67.3	78.4	85.4
NOx**.....	935.4	625.5	367.7	72.9	40.5
Oil temperature, F.....	239	235	235	233	232
Oil pressure, psi.....	59	58	58	60	62
Coolant temperature, F.....	191	188	186	186	186
Exhaust temperature, F.....	1252	1162	1076	1007	955
Exhaust pressure, in H2O....	45.0	31.0	27.0	12.2	9.0
<u>After Catalyst</u>					
Concentrations, dry basis:					
CO, %.....	.0034	.0035	.0029	.0048	.0050
CO2, %.....	13.60	13.00	13.15	13.15	13.00
O2, %.....	2.33	2.75	2.50	2.60	2.67
HC, ppmC.....	42	60	67	80	142
NOx, ppm.....	2950	2550	2175	565	435
Air-fuel ratio.....	16.70	17.09	16.86	16.87	16.93
Emission rates, g/hr:					
CO.....	7.6	6.1	3.7	4.4	3.7
HC.....	4.7	5.3	4.3	3.7	5.3
NOx**.....	888.7	604.9	375.3	70.1	43.9
Exhaust temperature, F.....	1150	1069	981	895	864
Exhaust pressure, in H2O....	25.0	11.0	5.8	2.0	1.1

* Corrected - SAE J816b

** Corrected for humidity.

Engine..... Chrysler 318-CID
 Fuel..... 7516

Test Number.....	43	44	45	46	47
Test Date.....	12/ 6/75	12/ 6/75	12/ 6/75	12/ 6/75	12/ 6/75
Barometer, mm Hg.....	755.9	755.9	753.6	753.6	753.6
Humidity, grains/lb.....	30	30	24	24	24
Temperature, F.....	60	59	62	61	61
Engine speed, rpm.....	2000	2000	2000	2000	2000
Torque, lb-ft.....	11.0	0.0	202.0	180.0	135.0
Power, bhp*.....	4.0	0.0	74.0	65.9	49.4
Fuel rate, lb/hr.....	8.9	8.7	36.1	31.8	25.1
Ignition timing, deg BTC....	45.0	45.0	23.0	21.0	29.0
Manifold vacuum, in Hg.....	21.6	22.2	3.8	4.4	8.2
Throttle angle, deg.....	2.5	2.0	30.0	24.5	14.5
<u>Before Catalyst</u>					
Concentrations, dry basis:					
CO, %.....	.1550	.1780	.0850	.0880	.0930
CO2, %.....	12.55	11.95	13.00	12.70	12.40
O2, %.....	3.40	4.25	3.05	3.30	3.65
HC, ppmC.....	3059	6197	460	431	622
NOx, ppm.....	400	213	3050	2400	1925
Air-fuel ratio.....	17.07	17.38	17.22	17.44	17.73
Emission rates, g/hr:					
CO.....	96.0	110.0	215.5	199.1	169.0
HC.....	95.5	193.0	58.8	49.1	57.0
NOx**.....	33.6	17.8	1024.8	719.5	463.6
Oil temperature, F.....	232	233	240	234	231
Oil pressure, psi.....	62	62	59	58	58
Coolant temperature, F.....	186	186	190	188	186
Exhaust temperature, F.....	877	857	1260	1240	1167
Exhaust pressure, in H2O....	6.5	6.0	47.0	44.0	40.0
<u>After Catalyst</u>					
Concentrations, dry basis:					
CO, %.....	.0055	.0053	.0046	.0034	.0035
CO2, %.....	12.40	12.70	13.00	12.85	12.55
O2, %.....	3.00	3.25	2.80	3.20	3.57
HC, ppmC.....	203	340	47	35	51
NOx, ppm.....	365	260	3450	2400	1750
Air-fuel ratio.....	17.28	17.39	17.16	17.45	17.77
Emission rates, g/hr:					
CO.....	3.5	3.3	11.6	7.7	6.4
HC.....	6.4	10.5	5.9	4.0	4.7
NOx**.....	31.0	21.7	1155.8	719.2	422.1
Exhaust temperature, F.....	813	857	1162	1140	1079
Exhaust pressure, in H2O....	.3	.1	34.0	26.0	16.0

* Corrected - SAE J816b

** Corrected for humidity.

Engine..... Chrysler 318-CID
 Fuel..... 7516

Test Number.....	48	49	50	51	52
Test Date.....	12/ 6/75	12/ 6/75	12/ 6/75	12/ 6/75	12/ 6/75
Barometer, mm Hg.....	753.6	753.6	753.6	753.6	753.6
Humidity, grains/lb.....	24	24	24	24	24
Temperature, F.....	60	59	58	57	57
Engine speed, rpm.....	2000	2000	2000	2000	2000
Torque, lb-ft.....	90.0	45.0	25.0	11.0	0.0
Power, bhp*.....	32.9	16.4	8.4	4.0	0.0
Fuel rate, lb/hr.....	18.3	13.7	10.1	9.3	8.7
Ignition timing, deg BTC....	42.0	42.0	43.0	42.0	42.0
Manifold vacuum, in Hg.....	12.6	16.8	20.8	21.8	22.2
Throttle angle, deg.....	8.0	4.0	2.5	2.2	2.0
<u>Before Catalyst</u>					
Concentrations, dry basis:					
CO, %.....	.0840	.1305	.1190	.1370	.1750
CO2, %.....	12.70	12.70	12.70	12.40	12.10
O2, %.....	3.20	3.20	3.27	3.65	4.00
HC, ppmC.....	998	1701	1418	1697	5641
NOx, ppm.....	1575	500	570	330	225
Air-fuel ratio.....	17.26	17.10	17.20	17.48	17.24
Emission rates, g/hr:					
CO.....	108.5	124.8	84.8	91.2	107.6
HC.....	65.0	82.0	50.9	56.9	174.8
NOx**.....	269.7	63.4	53.8	29.1	18.3
Oil temperature, F.....	231	233	232	232	232
Oil pressure, psi.....	58	60	61	61	61
Coolant temperature, F.....	187	186	186	185	185
Exhaust temperature, F.....	1076	1023	942	896	865
Exhaust pressure, in H2O....	38.0	13.3	7.8	6.2	5.6
<u>After Catalyst</u>					
Concentrations, dry basis:					
CO, %.....	.0030	.0039	.0034	.0046	.0050
CO2, %.....	12.85	12.70	12.85	12.70	13.00
O2, %.....	3.05	3.00	3.05	3.25	3.00
HC, ppmC.....	57	85	79	198	284
NOx, ppm.....	1650	400	610	350	280
Air-fuel ratio.....	17.31	17.24	17.26	17.42	17.16
Emission rates, g/hr:					
CO.....	3.9	3.8	2.4	3.0	3.0
HC.....	3.7	4.1	2.9	6.6	8.7
NOx**.....	283.0	51.2	57.8	30.7	22.5
Exhaust temperature, F.....	985	914	843	806	842
Exhaust pressure, in H2O....	8.0	3.5	.7	.2	0.0

* Corrected - SAE J816b

** Corrected for humidity.

Engine..... Chrysler 318-CID
 Fuel..... 7516

Test Number.....	53	54	55	56	57
Test Date.....	12/ 8/75	12/ 8/75	12/ 8/75	12/ 8/75	12/ 8/75
Barometer, mm Hg.....	746.2	746.2	746.2	746.2	746.2
Humidity, grains/lb.....	28	28	28	28	28
Temperature, F.....	68	67	69	68	67
Engine speed, rpm.....	2500	2500	2500	2500	2500
Torque, lb-ft.....	200.0	178.0	133.0	89.0	44.0
Power, bhp*.....	93.1	82.8	62.0	41.4	20.5
Fuel rate, lb/hr.....	43.4	40.7	30.1	23.4	16.4
Ignition timing, deg BTC....	24.0	23.0	35.0	48.0	49.0
Manifold vacuum, in Hg.....	4.0	5.0	8.8	13.4	17.2
Throttle angle, deg.....	34.0	29.5	28.0	13.0	8.2
<u>Before Catalyst</u>					
Concentrations, dry basis:					
CO, %.....	.0850	.0895	.0980	.1050	.1340
CO2, %.....	13.60	13.30	13.15	13.00	13.00
O2, %.....	2.17	2.70	2.90	3.08	2.87
HC, ppmC.....	292	251	626	768	694
NOx, ppm.....	3600	2500	2700	2300	710
Air-fuel ratio.....	16.53	16.92	17.04	17.16	16.94
Emission rates, g/hr:					
CO.....	247.6	250.7	204.7	168.6	151.8
HC.....	42.8	35.4	65.9	63.3	39.6
NOx**.....	1409.2	940.8	757.8	505.7	108.1
Oil temperature, F.....	244	239	245	244	246
Oil pressure, psi.....	63	61	59	59	60
Coolant temperature, F.....	192	192	191	191	189
Exhaust temperature, F.....	1272	1287	1251	1160	1101
Exhaust pressure, in H2O....	90.0	84.0	70.0	62.0	32.0
<u>After Catalyst</u>					
Concentrations, dry basis:					
CO, %.....	.0050	.0050	.0046	.0046	.0050
CO2, %.....	13.45	13.45	13.30	13.15	13.30
O2, %.....	2.20	2.63	2.80	2.95	2.70
HC, ppmC.....	39	27	43	50	46
NOx, ppm.....	3450	2800	2750	2138	790
Air-fuel ratio.....	16.65	16.94	17.08	17.19	16.94
Emission rates, g/hr:					
CO.....	14.7	14.0	9.6	7.5	5.7
HC.....	5.7	3.9	4.5	4.1	2.6
NOx**.....	1361.8	1053.9	772.9	470.4	120.0
Exhaust temperature, F.....	1164	1180	1152	1061	993
Exhaust pressure, in H2O....	51.0	48.0	25.0	11.0	7.0

* Corrected - SAE J816b

** Corrected for humidity.

Engine..... Chrysler 318-CID
 Fuel..... 7516

Test Number.....	58	59	60	61	62
Test Date.....	12/ 8/75	12/ 8/75	12/ 8/75	12/ 8/75	12/ 8/75
Barometer, mm Hg.....	746.2	746.2	746.2	746.2	746.2
Humidity, grains/lb.....	28	28	28	28	28
Temperature, F.....	65	65	64	63	68
Engine speed, rpm.....	2500	2500	2500	2500	2500
Torque, lb-ft.....	22.0	11.0	0.0	133.0	89.0
Power, bhp*.....	10.2	5.1	0.0	61.9	41.4
Fuel rate, lb/hr.....	13.8	12.5	11.1	32.8	24.3
Ignition timing, deg BTC....	48.0	48.0	48.0	36.0	49.0
Manifold vacuum, in Hg.....	19.0	19.8	20.8	8.4	13.0
Throttle angle, deg.....	6.5	5.9	5.0	20.0	13.5
<u>Before Catalyst</u>					
Concentrations, dry basis:					
CO, %.....	.1700	.1880	.2080	.1030	.0048
CO2, %.....	13.00	12.70	11.70	12.85	12.85
O2, %.....	3.10	3.45	4.80	3.25	3.18
HC, ppmC.....	1706	3007	9837	443	692
NOx, ppm.....	335	218	183	2375	2250
Air-fuel ratio.....	16.94	17.06	17.33	17.36	17.34
Emission rates, g/hr:					
CO.....	161.5	163.2	165.6	239.1	8.2
HC.....	81.7	131.6	394.6	51.8	59.9
NOx**.....	42.8	25.4	19.5	740.7	519.1
Oil temperature, F.....	243	243	243	246	250
Oil pressure, psi.....	61	61	62	61	60
Coolant temperature, F.....	189	190	189	191	191
Exhaust temperature, F.....	1070	1042	976	1164	1179
Exhaust pressure, in H2O....	14.5	12.0	10.2	64.0	60.0
<u>After Catalyst</u>					
Concentrations, dry basis:					
CO, %.....	.0058	.0064	.0084	.0050	.1050
CO2, %.....	13.30	13.15	12.85	12.85	12.70
O2, %.....	2.80	2.85	3.20	3.25	3.28
HC, ppmC.....	85	171	454	42	5
NOx, ppm.....	330	270	235	2200	2075
Air-fuel ratio.....	16.99	17.03	17.31	17.48	17.46
Emission rates, g/hr:					
CO.....	5.5	5.5	6.6	11.7	181.6
HC.....	4.1	7.4	18.0	4.9	.4
NOx**.....	42.2	31.4	24.9	690.9	482.2
Exhaust temperature, F.....	947	960	973	1060	1086
Exhaust pressure, in H2O....	2.8	1.4	.8	26.0	18.0

* Corrected - SAE J816b

** Corrected for humidity.

Engine..... Chrysler 318-CID
 Fuel..... 7516

Test Number.....	63	64	65	67	68
Test Date.....	12/ 8/75	12/ 8/75	12/ 8/75	12/ 8/75	12/ 8/75
Barometer, mm Hg.....	746.2	746.2	746.2	746.2	746.2
Humidity, grains/lb.....	28	28	28	28	28
Temperature, F.....	66	65	64	67	71
Engine speed, rpm.....	2500	2500	2500	3000	3000
Torque, lb-ft.....	44.0	22.0	11.0	185.0	165.0
Power, bhp*.....	20.4	10.2	5.1	103.2	92.4
Fuel rate, lb/hr.....	16.4	13.6	12.1	51.9	47.2
Ignition timing, deg BTC....	48.0	49.0	48.0	28.0	27.0
Manifold vacuum, in Hg.....	17.4	19.0	19.8	4.6	7.0
Throttle angle, deg.....	8.5	6.5	5.5	39.0	33.9
<u>Before Catalyst</u>					
Concentrations, dry basis:					
CO, %.....	.1420	.1780	.1950	.0805	.0750
CO2, %.....	12.70	12.55	12.25	13.95	13.60
O2, %.....	3.05	3.38	4.00	1.83	2.32
HC, ppmC.....	681	2832	5650	186	146
NOx, ppm.....	635	315	206	3450	2850
Air-fuel ratio.....	17.11	17.07	17.20	16.27	16.64
Emission rates, g/hr:					
CO.....	162.5	168.6	166.8	275.3	239.5
HC.....	39.3	135.2	243.6	32.1	23.5
NOx**.....	97.7	40.1	23.7	1585.4	1222.6
Oil temperature, F.....	247	243	241	254	252
Oil pressure, psi.....	60	61	61	60	59
Coolant temperature, F.....	189	190	189	192	192
Exhaust temperature, F.....	1111	1063	1015	1369	1409
Exhaust pressure, in H2O....	40.0	15.0	12.5	124.0	110.0
<u>After Catalyst</u>					
Concentrations, dry basis:					
CO, %.....	.0051	.0064	.0071	.0056	.0053
CO2, %.....	13.00	13.00	13.00	13.95	13.60
O2, %.....	2.85	3.00	3.10	1.85	2.32
HC, ppmC.....	386	153	318	264	18
NOx, ppm.....	740	325	260	3400	2850
Air-fuel ratio.....	17.05	17.18	17.23	16.31	16.70
Emission rates, g/hr:					
CO.....	5.8	6.1	6.0	19.2	17.0
HC.....	22.2	7.3	13.7	45.6	2.9
NOx**.....	113.2	41.5	29.8	1567.2	1227.1
Exhaust temperature, F.....	1000	962	976	1255	1302
Exhaust pressure, in H2O....	5.6	2.4	1.0	86.0	70.0

* Corrected - SAE J816b

** Corrected for humidity.

Engine..... Chrysler 318-CID
 Fuel..... 7516

Test Number.....	69	70	71	72	73
Test Date.....	12/ 8/75	12/ 8/75	12/ 8/75	12/ 8/75	12/ 8/75
Barometer, mm Hg.....	746.2	746.2	746.2	746.2	746.2
Humidity, grains/lb.....	28	28	28	28	28
Temperature, F.....	71	68	67	65	64
Engine speed, rpm.....	3000	3000	3000	3000	3000
Torque, lb-ft.....	124.0	32.0	41.0	21.0	10.0
Power, bhp*.....	69.5	45.8	22.9	11.7	5.6
Fuel rate, lb/hr.....	33.7	27.0	19.7	16.7	15.5
Ignition timing, deg BTC....	34.0	48.0	50.0	50.0	50.0
Manifold vacuum, in Hg.....	8.8	13.4	15.4	19.0	19.6
Throttle angle, deg.....	20.5	15.0	10.5	8.5	7.5
<u>Before Catalyst</u>					
Concentrations, dry basis:					
CO, %.....	.0513	.1180	.1370	.1430	.1700
CO2, %.....	12.85	12.85	13.00	13.00	12.85
O2, %.....	3.40	3.27	3.18	3.05	3.27
HC, ppmC.....	239	420	279	227	1306
NOx, ppm.....	2388	2225	730	455	335
Air-fuel ratio.....	17.55	17.36	17.22	17.12	17.14
Emission rates, g/hr:					
CO.....	75.4	226.0	189.6	167.0	183.9
HC.....	35.1	40.6	19.4	13.4	71.2
NOx**.....	772.8	572.6	135.7	71.4	48.7
Oil temperature, F.....	247	247	250	249	250
Oil pressure, psi.....	59	59	60	61	61
Coolant temperature, F.....	191	190	191	191	190
Exhaust temperature, F.....	1306	1223	1178	1151	1128
Exhaust pressure, in H2O....	90.0	60.0	38.0	32.0	28.0
<u>After Catalyst</u>					
Concentrations, dry basis:					
CO, %.....	.0053	.0055	.0053	.0058	.0062
CO2, %.....	12.85	13.00	13.15	13.15	13.15
O2, %.....	3.25	3.17	3.00	2.93	2.90
HC, ppmC.....	23	87	12	15	57
NOx, ppm.....	2500	2225	800	465	370
Air-fuel ratio.....	17.49	17.38	17.19	17.12	17.09
Emission rates, g/hr:					
CO.....	12.7	10.5	7.3	6.8	6.7
HC.....	2.7	8.4	.8	.9	3.1
NOx**.....	807.0	572.8	148.4	72.9	53.5
Exhaust temperature, F.....	1220	1124	1053	1009	1009
Exhaust pressure, in H2O....	40.0	22.0	9.0	4.9	2.0

* Corrected - SAE J816b

** Corrected for humidity.

Engine..... Chrysler 318-CID
 Fuel..... 7516

Test Number.....	74	75	76	77	78
Test Date.....	12/ 8/75	12/ 8/75	12/ 8/75	12/ 8/75	12/ 8/75
Barometer, mm Hg.....	746.2	746.2	746.2	746.2	746.2
Humidity, grains/lb.....	28	28	28	28	28
Temperature, F.....	64	61	62	60	59
Engine speed, rpm.....	3000	3000	3000	3000	3000
Torque, lb-ft.....	0.0	124.0	82.0	41.0	21.0
Power, bhp*.....	0.0	68.8	45.5	22.7	11.6
Fuel rate, lb/hr.....	13.9	37.3	25.7	19.8	16.4
Ignition timing, deg BTC....	50.0	40.0	50.0	50.0	50.0
Manifold vacuum, in Hg.....	20.2	9.0	13.4	17.5	19.2
Throttle angle, deg.....	6.9	22.5	14.8	10.0	8.0
<u>Before Catalyst</u>					
Concentrations, dry basis:					
CO, %.....	.2200	.1010	.1190	.1530	.1500
CO2, %.....	12.40	12.85	12.85	13.00	13.30
O2, %.....	4.00	3.35	3.38	3.10	3.10
HC, ppmC.....	4187	292	400	432	855
NOx, ppm.....	225	2025	1950	675	410
Air-fuel ratio.....	17.35	17.45	17.44	17.14	17.02
Emission rates, g/hr:					
CO.....	217.6	268.0	226.3	183.7	170.2
HC.....	208.7	39.1	38.4	30.1	48.9
NOx**.....	29.9	722.0	498.2	125.2	62.5
Oil temperature, F.....	251	254	257	256	253
Oil pressure, psi.....	61	61	60	61	61
Coolant temperature, F.....	191	192	191	190	189
Exhaust temperature, F.....	1085	1228	1205	1177	1145
Exhaust pressure, in H2O....	25.0	93.0	62.0	40.0	33.0
<u>After Catalyst</u>					
Concentrations, dry basis:					
CO, %.....	.0087	.0058	.0055	.0055	.0062
CO2, %.....	13.00	13.00	13.00	13.30	13.15
O2, %.....	3.20	3.38	3.25	2.95	2.95
HC, ppmC.....	244	142	31	14	46
NOx, ppm.....	270	2200	191	735	435
Air-fuel ratio.....	17.31	17.53	17.38	17.12	17.13
Emission rates, g/hr:					
CO.....	8.6	15.5	10.4	7.6	7.1
HC.....	12.1	19.1	2.9	1.0	2.6
NOx**.....	35.7	787.4	48.7	136.0	66.9
Exhaust temperature, F.....	1026	1117	1107	1049	1007
Exhaust pressure, in H2O....	1.0	42.0	22.0	11.0	4.9

* Corrected - SAE J316b

** Corrected for humidity.

Engine..... Chrysler 318-CID
 Fuel..... 7516

Test Number.....	79	80	81	82	83
Test Date.....	12/ 8/75	12/ 8/75	12/11/75	12/11/75	12/11/75
Barometer, mm Hg.....	756.2	756.2	741.7	741.7	741.7
Humidity, grains/lb.....	27	27	105	105	105
Temperature, F.....	58	57	79	91	82
Engine speed, rpm.....	3000	3000	3500	3500	3500
Torque, lb-ft.....	10.0	0.0	180.0	160.0	120.0
Power, bhp*.....	5.5	0.0	121.3	109.0	81.1
Fuel rate, lb/hr.....	15.0	14.2	58.1	50.0	41.1
Ignition timing, deg BTC....	50.0	50.0	29.0	29.0	39.0
Manifold vacuum, in Hg.....	20.0	20.4	4.5	5.2	8.2
Throttle angle, deg.....	7.0	6.5	41.0	34.5	24.9
<u>Before Catalyst</u>					
Concentrations, dry basis:					
CO, %.....	.1900	.2000	.1750	.0750	.0950
CO2, %.....	12.40	12.25	14.90	14.25	13.30
O2, %.....	3.67	3.90	1.05	1.85	3.00
HC, ppmC.....	3621	4520	232	144	52
NOx, ppm.....	310	270	3550	3000	2700
Air-fuel ratio.....	17.20	17.27	15.62	16.24	17.17
Emission rates, g/hr:					
CO.....	200.3	200.6	640.0	246.5	272.3
HC.....	192.4	228.5	42.7	23.8	7.5
NOx**.....	43.9	36.3	2478.9	1882.5	1478.0
Oil temperature, F.....	252	253	261	259	255
Oil pressure, psi.....	61	61	60	60	60
Coolant temperature, F.....	190	191	191	190	190
Exhaust temperature, F.....	1082	1043	1464	1434	1340
Exhaust pressure, in H2O....	29.0	26.0	138.0	125.0	115.0
<u>After Catalyst</u>					
Concentrations, dry basis:					
CO, %.....	.0075	.0085	.0093	.0056	.0056
CO2, %.....	13.30	13.30	14.90	14.25	13.30
O2, %.....	3.00	2.73	1.05	1.87	2.92
HC, ppmC.....	205	319	30	18	22
NOx, ppm.....	360	330	3600	2950	2750
Air-fuel ratio.....	17.12	16.90	15.73	16.31	17.17
Emission rates, g/hr:					
CO.....	7.8	8.3	34.3	18.5	16.1
HC.....	10.8	15.7	5.6	3.0	3.1
NOx**.....	50.3	43.2	2532.1	1858.9	1506.7
Exhaust temperature, F.....	1024	1041	1348	1311	1226
Exhaust pressure, in H2O....	2.2	1.2	98.0	79.0	54.0

* Corrected - SAE J 816b

** Corrected for humidity.

Engine..... Chrysler 318-CID
 Fuel..... 7516

Test Number.....	84	85	86	87	88
Test Date.....	12/11/75	12/11/75	12/11/75	12/11/75	12/11/75
Barometer, mm Hg.....	741.7	741.7	741.7	741.7	741.7
Humidity, grains/lb.....	105	105	105	105	105
Temperature, F.....	76	75	72	72	71
Engine speed, rpm.....	3500	3500	3500	3500	3500
Torque, lb-ft.....	80.0	40.0	20.0	10.0	0.0
Power, bhp*.....	53.8	26.9	13.4	6.7	0.0
Fuel rate, lb/hr.....	30.9	22.8	18.6	17.2	16.0
Ignition timing, deg BTC....	53.0	52.0	51.0	51.0	52.0
Manifold vacuum, in Hg.....	13.0	15.0	18.3	19.6	20.0
Throttle angle, deg.....	17.0	12.0	9.5	8.5	7.9
<u>Before Catalyst</u>					
Concentrations, dry basis:					
CO, %.....	.1125	.1180	.1160	.1250	.1390
CO2, %.....	13.15	13.30	13.30	13.15	13.00
O2, %.....	3.00	2.77	2.82	3.00	3.12
HC, ppmC.....	268	245	188	797	1137
NOx, ppm.....	2650	865	385	275	2275
Air-fuel ratio.....	17.15	16.89	16.92	16.99	17.12
Emission rates, g/hr:					
CO.....	242.8	184.8	148.7	148.6	155.0
HC.....	29.1	19.4	12.2	47.8	63.9
NOx**.....	1092.2	258.7	94.2	62.4	484.5
Oil temperature, F.....	256	257	255	254	254
Oil pressure, psi.....	60	60	61	63	63
Coolant temperature, F.....	189	189	189	188	188
Exhaust temperature, F.....	1248	1212	1177	1161	1138
Exhaust pressure, in H2O....	69.0	49.0	33.0	30.0	28.0
<u>After Catalyst</u>					
Concentrations, dry basis:					
CO, %.....	.0056	.0050	.0053	.0053	.0060
CO2, %.....	13.30	13.30	13.30	13.30	13.30
O2, %.....	2.95	2.70	2.78	2.80	2.85
HC, ppmC.....	30	15	137	34	97
NOx, ppm.....	2600	910	405	305	265
Air-fuel ratio.....	17.19	16.94	16.97	16.99	17.02
Emission rates, g/hr:					
CO.....	12.1	7.9	6.8	6.3	6.6
HC.....	3.3	1.2	8.9	2.0	5.4
NOx**.....	1073.1	273.1	99.5	69.2	56.0
Exhaust temperature, F.....	1126	1065	1012	994	984
Exhaust pressure, in H2O....	30.0	17.0	8.5	5.6	3.7

* Corrected - SAE J816b
 ** Corrected for humidity.

Engine..... Chrysler 318-CID
 Fuel..... 7516

Test Number.....	89	90	91	92	93
Test Date.....	12/11/75	12/11/75	12/11/75	12/11/75	12/11/75
Barometer, mm Hg.....	741.7	741.7	741.7	741.7	741.7
Humidity, grains/lb.....	105	105	105	105	105
Temperature, F.....	73	77	76	74	70
Engine speed, rpm.....	3500	3500	3500	3500	3500
Torque, lb-ft.....	120.0	80.0	40.0	20.0	10.0
Power, bhp*.....	30.4	53.8	26.9	13.4	6.7
Fuel rate, lb/hr.....	41.1	31.4	25.1	18.6	18.0
Ignition timing, deg BTC....	40.0	47.0	47.0	47.0	48.0
Manifold vacuum, in Hg.....	8.8	13.8	17.0	18.8	19.2
Throttle angle, deg.....	24.5	16.5	12.0	9.5	9.0
<u>Before Catalyst</u>					
Concentrations, dry basis:					
CO, %.....	.0930	.1080	.1080	.1105	.0990
CO2, %.....	13.15	13.30	13.30	13.30	13.30
O2, %.....	3.00	2.70	2.77	2.33	2.90
HC, ppmC.....	216	371	211	182	114
NOx, ppm.....	2600	1925	745	370	260
Air-fuel ratio.....	17.17	16.87	16.90	16.93	16.99
Emission rates, g/hr:					
CO.....	267.1	232.7	171.8	141.2	123.2
HC.....	31.3	40.2	16.9	11.8	7.2
NOx**.....	1425.7	791.9	226.3	90.3	61.8
Oil temperature, F.....	258	257	259	256	253
Oil pressure, psi.....	61	61	63	61	63
Coolant temperature, F.....	189	190	189	189	189
Exhaust temperature, F.....	1284	1222	1217	1191	1177
Exhaust pressure, in H2O....	97.0	56.0	47.0	30.0	28.0
<u>After Catalyst</u>					
Concentrations, dry basis:					
CO, %.....	.0058	.0060	.0053	.0056	.0051
CO2, %.....	13.15	13.45	13.45	13.30	13.30
O2, %.....	3.07	2.60	2.60	2.87	2.35
HC, ppmC.....	24	26	13	13	8
NOx, ppm.....	2450	2000	800	370	285
Air-fuel ratio.....	17.30	16.89	16.85	17.05	17.03
Emission rates, g/hr:					
CO.....	15.8	12.9	3.4	7.2	6.4
HC.....	3.6	2.8	1.0	.8	.5
NOx**.....	1353.8	322.8	242.1	91.0	67.9
Exhaust temperature, F.....	1162	1089	1061	1023	996
Exhaust pressure, in H2O....	51.0	25.0	17.0	10.0	6.0

* Corrected - SAE J816b

** Corrected for humidity.

Engine..... Chrysler 318-CID
 Fuel..... 7516

Test Number.....	94	95	96	97	98
Test Date.....	12/11/75	12/11/75	12/11/75	12/11/75	12/11/75
Barometer, mm Hg.....	741.7	741.7	741.7	741.7	741.7
Humidity, grains/lb.....	105	105	105	105	105
Temperature, F.....	69	73	30	79	79
Engine speed, rpm.....	3500	4000	4000	4000	4000
Torque, lb-ft.....	0.0	156.0	138.0	104.0	69.0
Power, bhp*.....	0.0	119.5	106.4	80.1	53.2
Fuel rate, lb/hr.....	16.1	61.4	56.6	45.3	33.7
Ignition timing, deg BTC....	47.0	27.0	27.0	37.5	49.0
Manifold vacuum, in Hg.....	20.0	5.0	5.8	8.6	13.0
Throttle angle, deg.....	8.0	39.5	37.0	26.8	18.5
<u>Before Catalyst</u>					
Concentrations, dry basis:					
CO, %.....	.1250	.2300	.0610	.0705	.1000
CO2, %.....	13.00	14.90	14.60	13.43	13.30
O2, %.....	3.15	.80	1.45	2.75	2.85
HC, ppmC.....	569	151	55	82	188
NOx, ppm.....	208	2363	2263	2225	2225
Air-fuel ratio.....	17.15	15.41	15.94	16.96	17.02
Emission rates, g/hr:					
CO.....	140.8	876.9	222.1	219.9	233.5
HC.....	32.3	28.9	10.2	12.9	22.1
NOx**.....	44.6	1719.9	1573.3	1325.2	992.1
Oil temperature, F.....	255	265	267	262	263
Oil pressure, psi.....	63	60	59	58	59
Coolant temperature, F.....	189	191	191	190	190
Exhaust temperature, F.....	1166	1496	1535	1435	1339
Exhaust pressure, in H2O....	26.0	138.0	133.0	97.0	61.0
<u>After Catalyst</u>					
Concentrations, dry basis:					
CO, %.....	.0060	.0111	.0053	.0051	.0053
CO2, %.....	13.30	14.90	14.43	13.45	13.30
O2, %.....	3.02	.85	1.47	2.70	2.85
HC, ppmC.....	34	14	8	10	16
NOx, ppm.....	228	2250	2300	2350	2225
Air-fuel ratio.....	17.15	15.55	16.00	16.97	17.10
Emission rates, g/hr:					
CO.....	6.7	42.8	19.4	15.9	12.4
HC.....	1.9	2.8	1.5	1.6	1.9
NOx**.....	48.9	1654.9	1608.2	1401.2	997.3
Exhaust temperature, F.....	999	1372	1400	1307	1206
Exhaust pressure, in H2O....	5.1	105.0	100.0	70.0	39.0

* Corrected - SAE J816b
 ** Corrected for humidity.

Engine..... Chrysler 318-CID
 Fuel..... 7516

Test Number.....	99	100	101	102	103
Test Date.....	12/11/75	12/11/75	12/11/75	12/11/75	12/12/75
Barometer, mm Hg.....	741.7	741.7	741.7	741.7	744.7
Humidity, grains/lb.....	105	105	105	105	47
Temperature, F.....	75	72	72	72	91
Engine speed, rpm.....	4000	4000	4000	4000	1200
Torque, lb-ft.....	35.0	18.0	9.0	0.0	264.0
Power, bhp*.....	26.9	13.8	6.9	0.0	60.6
Fuel rate, lb/hr.....	25.9	22.4	21.1	18.6	29.7
Ignition timing, deg BTC....	50.0	50.0	49.0	50.0	15.0
Manifold vacuum, in Hg.....	16.8	19.2	19.0	19.8	1.0
Throttle angle, deg.....	13.9	11.8	11.0	9.5	61.9
<u>Before Catalyst</u>					
Concentrations, dry basis:					
CO, %.....	.0940	.0860	.0805	.0840	6.2700
CO2, %.....	13.30	13.30	13.30	13.30	11.00
O2, %.....	2.75	2.67	2.65	2.77	.35
HC, ppmC.....	137	86	68	63	2333
NOx, ppm.....	938	515	375	265	1163
Air-fuel ratio.....	16.91	16.85	16.83	16.92	12.39
Emission rates, g/hr:					
CO.....	167.5	132.3	116.4	107.4	9489.8
HC.....	12.3	6.6	5.0	4.0	178.0
NOx**.....	319.0	151.2	103.5	64.7	255.7
Oil temperature, F.....	263	263	264	265	224
Oil pressure, psi.....	60	61	61	61	45
Coolant temperature, F.....	189	189	190	189	193
Exhaust temperature, F.....	1295	1265	1253	1226	1115
Exhaust pressure, in H2O....	50.0	33.0	29.0	27.0	1.1
<u>After Catalyst</u>					
Concentrations, dry basis:					
CO, %.....	.0048	.0046	.0044	.0050	6.3500
CO2, %.....	13.45	13.30	13.30	13.30	10.85
O2, %.....	2.67	2.67	2.63	2.70	.35
HC, ppmC.....	8	5	4	5	2331
NOx, ppm.....	1000	510	395	285	1100
Air-fuel ratio.....	16.90	16.91	16.88	16.92	12.35
Emission rates, g/hr:					
CO.....	8.5	7.1	6.4	6.4	9586.2
HC.....	.7	.4	.3	.3	177.3
NOx**.....	339.8	150.4	109.4	69.6	241.2
Exhaust temperature, F.....	1134	1089	1071	1050	1014
Exhaust pressure, in H2O....	21.0	11.0	9.0	7.0	.7

* Corrected - SAE J816b

** Corrected for humidity.

Engine..... Chrysler 318-CID
 Fuel..... 7516

Test Number.....	104	105	106	107	108
Test Date.....	12/12/75	12/12/75	12/12/75	12/12/75	12/12/75
Barometer, mm Hg.....	744.7	744.7	744.7	744.7	744.7
Humidity, grains/lb.....	47	47	47	47	47
Temperature, F.....	90	89	91	89	77
Engine speed, rpm.....	1500	2000	2500	3000	3500
Torque, lb-ft.....	270.0	270.0	265.0	250.0	230.0
Power, bhp*.....	77.5	103.2	126.8	143.3	152.1
Fuel rate, lb/hr.....	37.4	48.7	59.1	68.1	75.7
Ignition timing, deg BTC....	16.0	18.0	19.0	21.0	23.0
Manifold vacuum, in Hg.....	1.5	1.8	2.3	2.8	3.4
Throttle angle, deg.....	62.0	62.1	62.5	63.0	61.0
<u>Before Catalyst</u>					
Concentrations, dry basis:					
CO, %.....	5.5000	5.1700	4.3500	3.7000	3.7000
CO2, %.....	11.40	11.80	12.25	12.55	12.70
O2, %.....	.32	.25	.23	.25	.20
HC, ppmC.....	1931	1675	1358	1155	1128
NOx, ppm.....	1375	1425	1775	1900	1862
Air-fuel ratio.....	12.70	12.84	13.18	13.47	13.45
Emission rates, g/hr:					
CO.....	10723.1	13205.3	13823.5	13826.3	15328.4
HC.....	189.7	215.6	217.5	217.6	235.5
NOx**.....	389.4	528.7	819.3	1031.3	1120.5
Oil temperature, F.....	234	236	241	253	270
Oil pressure, psi.....	52	56	58	58	60
Coolant temperature, F.....	189	193	191	192	194
Exhaust temperature, F.....	1193	1285	1387	1513	1431
Exhaust pressure, in H2O....	1.8	3.1	4.8	6.4	7.6
<u>After Catalyst</u>					
Concentrations, dry basis:					
CO, %.....	5.5500	4.9000	4.2000	3.7000	3.6000
CO2, %.....	11.40	11.95	12.25	12.55	12.70
O2, %.....	.25	.13	.10	.12	.10
HC, ppmC.....	1730	1502	1242	1069	971
NOx, ppm.....	1338	1413	1675	1813	1775
Air-fuel ratio.....	12.66	12.89	13.16	13.39	13.44
Emission rates, g/hr:					
CO.....	10785.3	12557.1	13337.4	13756.3	14906.5
HC.....	169.4	194.0	198.7	200.2	202.7
NOx**.....	377.7	526.0	772.6	979.1	1067.6
Exhaust temperature, F.....	1085	1173	1278	1401	1317
Exhaust pressure, in H2O....	1.1	2.1	3.3	4.6	5.3

* Corrected - SAE J816b

** Corrected for humidity.

Engine..... Chrysler 318-CID
 Fuel..... 7516

Test Number.....	109	110	111	112	
Test Date.....	12/12/75	11/20/75	12/12/75	12/12/75	
Barometer, mm Hg.....	744.7	742.0	744.7	744.7	
Humidity, grains/lb.....	47	66	47	47	
Temperature, F.....	84	50	39	85	
Engine speed, rpm.....	4000	750	1600	4300	
Torque, lb-ft.....	205.0	0.0	272.0	135.0	
Power, bhp*.....	156.0	0.0	87.2	151.4	
Fuel rate, lb/hr.....	30.9	5.3	40.0	32.8	
Ignition timing, deg BTC....	24.5	4.0	15.5	26.0	
Manifold vacuum, in Hg.....	3.6	17.0	1.5	3.8	
Throttle angle, deg.....	62.5	0.0	62.1	62.1	
<u>Before Catalyst</u>					
Concentrations, dry basis:					
CO, %.....	4.2000	.4500	5.6000	4.2500	
CO2, %.....	12.40	13.60	11.48	12.40	
O2, %.....	.18	1.40	.30	.17	
HC, ppmC.....	1157	1018	1789	1128	
NOx, ppm.....	1575	91	1375	1425	
Air-fuel ratio.....	13.23	15.58	12.63	13.20	
Emission rates, g/hr:					
CO.....	18319.5	150.1	11625.7	18921.0	
HC.....	254.2	17.1	187.2	253.0	
NOx**.....	997.8	4.8	414.6	921.5	
Oil temperature, F.....	230	212	227	284	
Oil pressure, psi.....	58	37	50	55	
Coolant temperature, F.....	194	191	190	195	
Exhaust temperature, F.....	1486	666	1170	1508	
Exhaust pressure, in H2O....	8.3	20.0	2.1	8.7	
<u>After Catalyst</u>					
Concentrations, dry basis:					
CO, %.....	4.2000	.0111	5.5000	4.2000	
CO2, %.....	12.40	13.95	11.55	12.40	
O2, %.....	.10	.90	.25	.10	
HC, ppmC.....	1012	95	1732	937	
NOx, ppm.....	1500	92	1375	1413	
Air-fuel ratio.....	13.19	15.55	12.70	13.19	
Emission rates, g/hr:					
CO.....	18271.1	3.7	11429.1	18690.2	
HC.....	221.9	1.6	131.3	210.1	
NOx**.....	947.8	4.3	415.0	913.3	
Exhaust temperature, F.....	1367	784	1039	1385	
Exhaust pressure, in H2O....	5.6	4.0	1.4	6.0	

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** Corrected for humidity.