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# Baseline Fuel Economy and Emissions Tests of a Chrysler 1978, 225 CID Engine

(U.S.) Transportation Systems Center
Cambridge, MA

Prepared for

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# BASELINE
# FUEL ECONOMY AND EMISSIONS TESTS
# OF A
# CHRYSLER 1978, 225CID ENGINE

G. GAGNE, M. BELL, AND R. WALTER

U.S. DEPARTMENT OF TRANSPORTATION
RESEARCH AND SPECIAL PROGRAMS ADMINISTRATION
TRANSPORTATION SYSTEMS CENTER
CAMBRIDGE MA 02142

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16. Abstract

This document reports on baseline engine tests of a Chrysler 1978, 225 CID, six-cylinder engine. The tests were conducted in the Automotive Research Laboratory at the Transportation Systems Center. Test results presented herein are also filed on computer-based tapes (9-track ASC II) and are available from the National Technical Information Services (NTIS).

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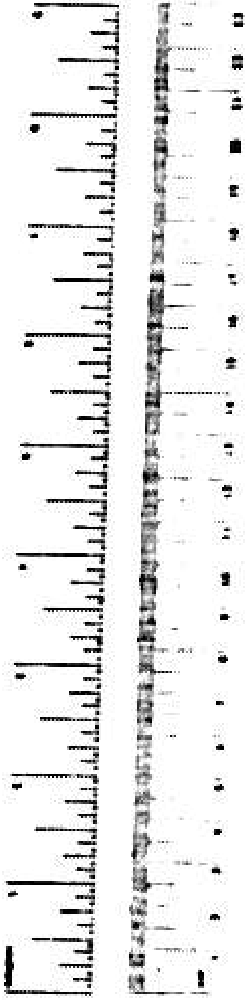
# PREFACE

This report presents the baseline, steady-state test results of a 1978 Chrysler 225 CID engine. This work was performed in the Automotive Research Laboratory at the Transportation Systems Center of the U.S. Department of Transportation. This work is in support of the Automotive Fuel Economy Research and Analysis Support Program for NHTSA's Technology Assessment Division, Office of Passenger Vehicle Research. The authors gratefully acknowledge the technical support of Ralph Colello, Dr. Thomas Trella, Russell Zub, and Norman Deserres.

# METRIC CONVERSION FACTORS

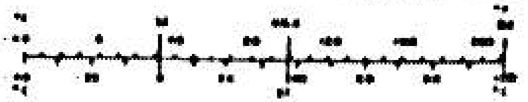
## Approximate Conversions to Metric Measures

| 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** | | |
| in² | square inches | 6.5 | square centimeters | cm² |
| ft² | square feet | 0.09 | square meters | m² |
| yd² | square yards | 0.8 | square meters | m² |
| mi² | square miles | 2.6 | square kilometers | km² |
| | 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 |
| ft³ | cubic feet | 0.03 | cubic meters | m³ |
| yd³ | cubic yards | 0.76 | cubic meters | m³ |
| | | **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** | | |
| cm² | square centimeters | 0.16 | square inches | in² |
| m² | square meters | 1.2 | square yards | yd² |
| km² | square kilometers | 0.4 | square miles | mi² |
| ha | hectares (10,000 m²) | 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 |
| m³ | cubic meters | 35 | cubic feet | ft³ |
| m³ | cubic meters | 1.3 | cubic yards | yd³ |
| | | **TEMPERATURE (exact)** | | |
| °C | Celsius temperature | 9/5 (then add 32) | Fahrenheit temperature | °F |



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# 1. INTRODUCTION

The work reported details the results of baseline, steady-state testing of a 1978 Chrysler, 6-cylinder, 225 CID engine. These tests measured the fuel rate and gaseous emissions while the engine was operated on a dynamometer at 57 speed/load points.

The objectives of this engine test are as follows:

- Characterize the fuel economy and emissions of present and prototype automotive engines;
- Provide an independent data base for vehicle performance modeling and fuel economy assessment.

## 2. EXPERIMENTAL DESIGN

This section briefly reviews the test design and highlights salient features of the Chrysler 225 CID baseline testing.

### 2.1 ENGINE

The manufacturers specifications for the Chrysler 225 CID engine are given in Table 1.

TABLE 1. ENGINE CHARACTERISTICS

| | |
|---|---|
| Model Year | 1978 |
| Manufacturer | Chrysler Corp. |
| No. of cylinders | 6 |
| Displacement | 225 CID (3.7L) |
| Bore | 3.40 inches (86 mm) |
| Stroke | 4.125 inches (105 mm) |
| Compression ratio | 8.4 to 1 |
| Max. Rated HP | 109 @ 3600 rpm |
| Max. Rated Torque | 182 @ 2000 rpm |
| Calibration | 49 State, automatic |
| Transmission type | automatic |
| Engine weight* | 564 lbs (256 kg ) |

This mean-tolerance engine was broken-in with the test schedule shown in Table 2. The engine came equipped with an oxidation catalyst and Exhaust Gas Recirculation (EGR) for emissions control. The engine was equipped with a manual transmission flywheel for mounting to the dynamometer.

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*Includes starter, alternator, fan, manual transmission flywheel, bell housing, wire harness, battery cables, vacuum lines, air inlet system. Does not include radiator, water hoses, exhaust pipes, muffler, engine coolant, oil.

TABLE 2. CHRYSLER 225 CID ENGINE BREAK-IN SCHEDULE

| Period (hr) | Speed (rpm) | Torque (lb-ft) |
|---|---|---|
| 1 | 1200 | 64.0 |
| 1 | 1600 | 94.5 |
| 1 | 2000 | 108.5 |
| 2 | 2400 | 122.5 |
| 2 | 2800 | 133.0 |
| 2 | 3200 | 136.5 |
| 2 | 3600 | 138.3(1) |
| 2 | 4000 | WOT (1) |
| 1/2 | 4400 | WOT (2) |

(1) Cycle 4 min. at load, 1 min. at 1600 rpm no load
(2) Check wide-open throttle (WOT) friction from 4400 rpm down

A single batch of unleaded Indolene test fuel was used for engine break-in and testing. The gasoline specifications are shown in Table 3.

TABLE 3. FUEL SPECIFICATIONS

Amoco Unleaded Indolene
Specific Gravity ... 0.7455@60°F
Percent Carbon... 83.39
Percent Hydrogen... 12.93
H/C Atomic ratio... 1.85
Upper heating value... 19,733 BTU/lb

## 2.2 TEST CONFIGURATION

The engine was installed in the Automotive Research Laboratory test cell No. 2. This cell has a DC, programmable dynamometer for power absorption and motoring tests. Figures 1 and 2 show the electronic and fluid - flow configurations for the engine mounted in the cell for testing. Figure 3 is an illustration of the engine installed in the cell.

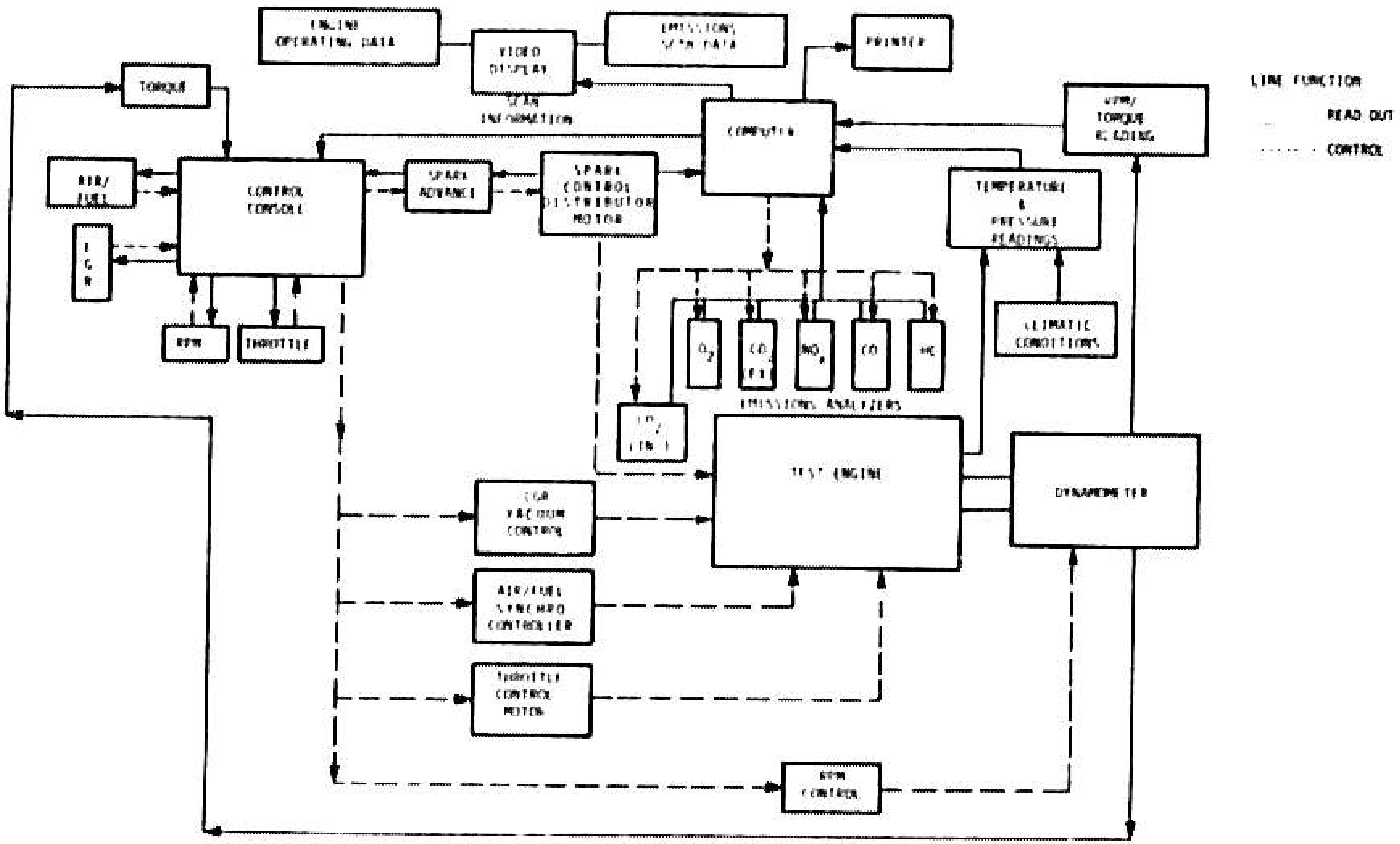

FIGURE 1. ELECTRONIC FLOW DIAGRAM

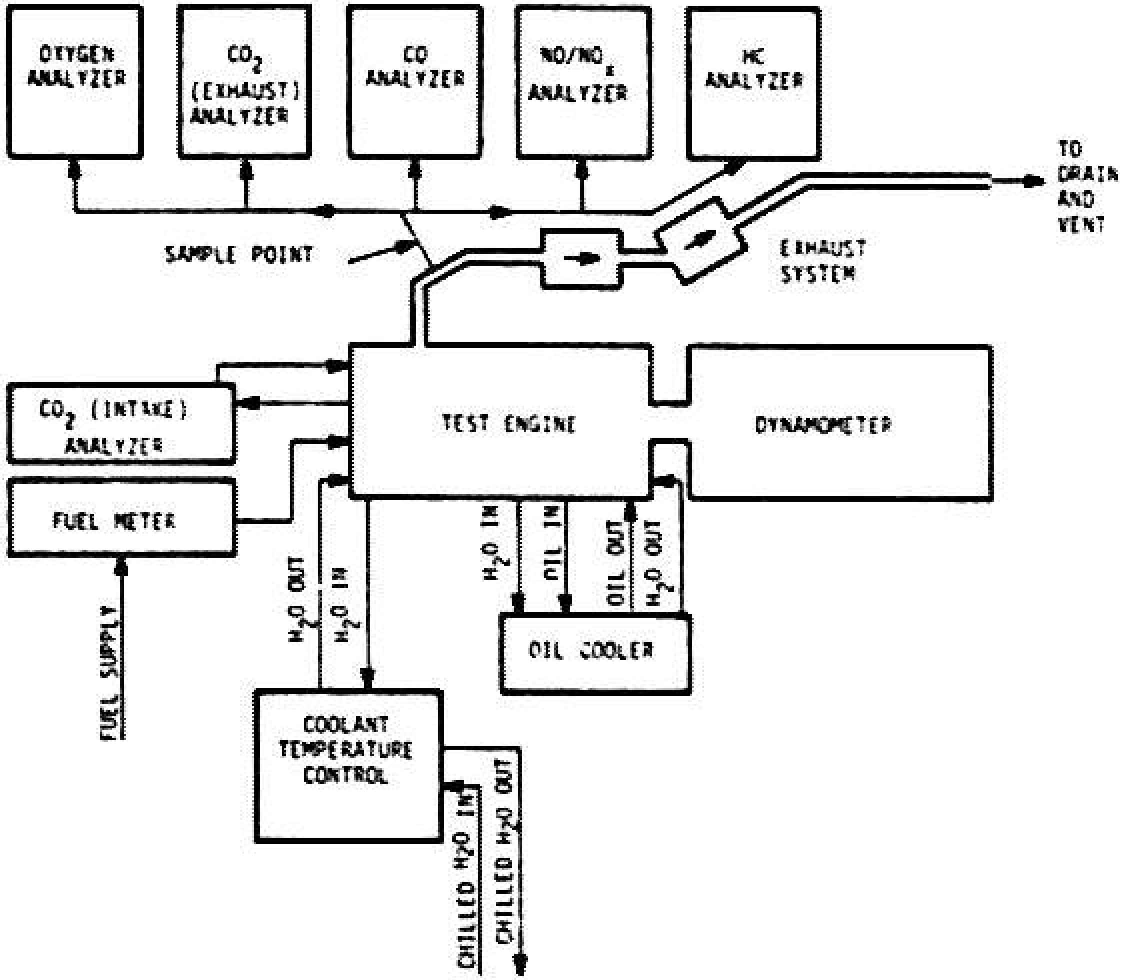

FIGURE 2. CELL NO. 2 TEST ENGINE FLUID FLOW

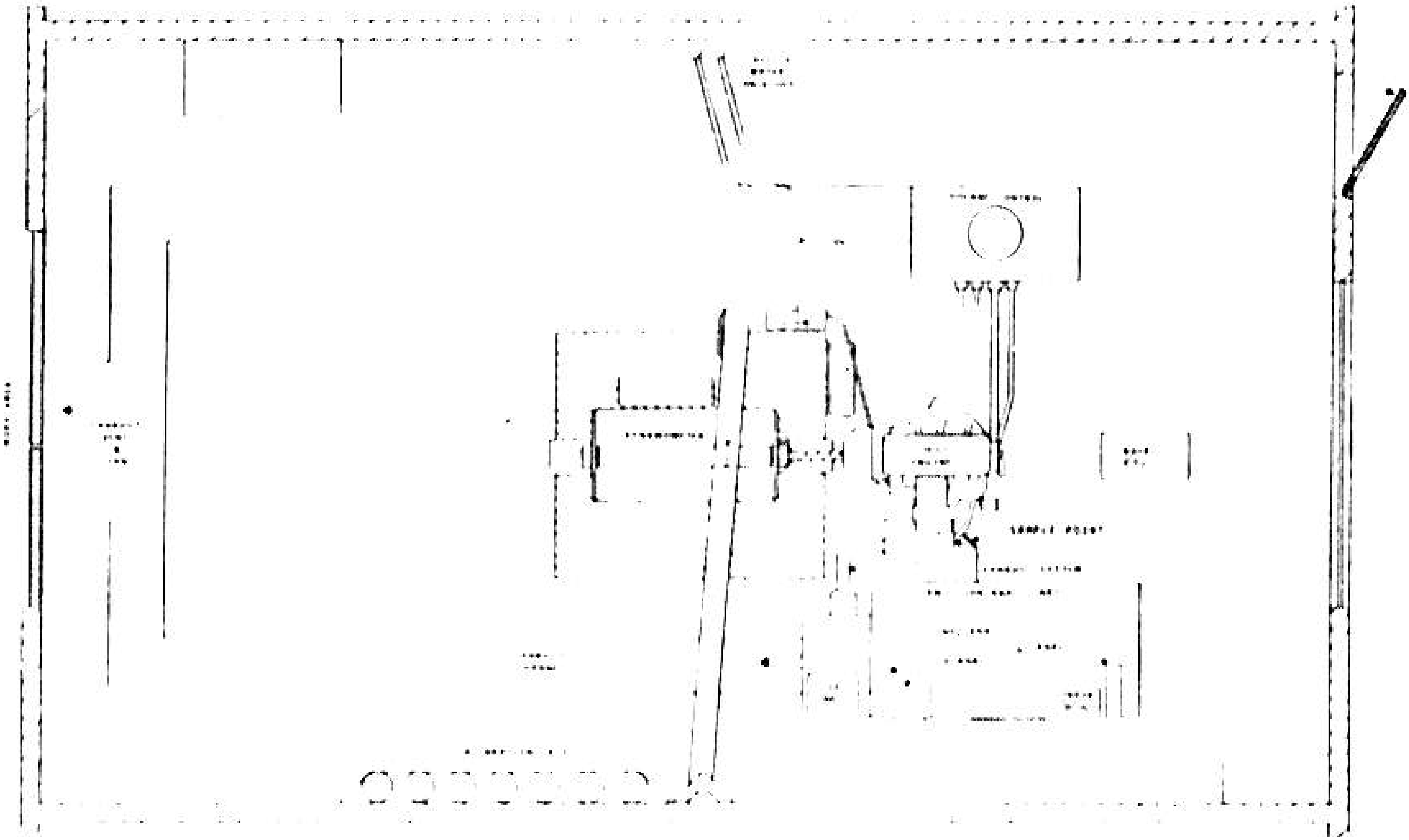

FIGURE 3. TEST CELL NO. 2 LAYOUT

Instead of the standard air cleaner, air induction was directed through a laminar-flow element connected by 4-inch ID plastic tubing to the carburetor. All engine vents (valve cover, carburetor, charcoal canister) were connected to the air-inlet system. Engine coolant and oil temperatures were maintained at 185°F ± 2°F by external heat exchangers. Although all emissions measurements were made before the catalyst, it, as well as a muffler, were installed in the exhaust system in order to duplicate the normal engine back-pressure.

### 2.2.1 Instrumentation

Real-time measurements of emissions and engine performance were accomplished by the analog instrumentation shown in Table 4.

### 2.2.2 Data Acquisition

The data acquisition system was Hewlett-Packard 21MX mini-computer with a 45kHz A/D converter and multiplexer. Analog signals from the instrumentation shown in Table 4 were routed, along with digital speed and torque signals, to this computer. The data was continuously updated on a video display and line printer. Data was stored on a disc for subsequent reduction.

## 2.3 BASELINE TEXT MATRIX

The baseline data for this engine was collected by operating the engine in the steady-state mode with the factory calibrations of air-to-fuel ratio (A-F), spark advance (SA), and exhaust gas recirculation (EGR). The spark timing, distributor advance characteristics are shown in Figure 4. Figure 5 gives the EGR valve displacement versus actuation pressure. During these baseline tests the A-F varied between 13.2 and 19.8, spark advance from 10° to 24° BTDC, and EGR from 0.6% to 16.8%.

The test matrix consisted of 57 speed/load points from 750 rpm to 3600 rpm, as shown in Table 5. In general, these points correspond to 0%, 25%, 50%, 75%, and 100% of maximum positive torque and 25% and 75% of maximum negative torque. (Negative torque is obtained by motoring the powered engine with the dynamometer, thus simulating deceleration.

## TABLE 4. ANALOG INSTRUMENTATION

| MEASURED VARIABLE | INSTRUMENT TYPE |
|---|---|
| Oil temp. | OMEGA type K thermocouple; CJ compensator |
| Ambient temp. | YSI Model 46T6 Tele-thermometer |
| Inlet air flow | MERRIAM 50MC2-4 Laminar flow element |
| Inlet air diff. press. | MKS Baratron type 77 |
| Air inlet temp. | OMEGA type K thermocouple; CJ compensator |
| Fuel inlet temp. | OMEGA type K thermocouple; CJ compensator |
| Coolant inlet temp. | OMEGA type K thermocouple; CJ compensator |
| Relative/Humidity | WEATHERMEASURE Model HM111 |
| Exhaust CO | BECKMAN 864 Infrared Analyzer |
| Exhaust $CO_2$ | BECKMAN 864 Infrared Analyzer |
| Exhaust HC | BECKMAN 402 Hydrocarbon Analyzer |
| Exhaust NOx | BECKMAN 951 Chemiluminescent Analyzer |
| Exhaust $O_2$ | BECKMAN 14330 Paramagnetic Analyzer |
| Intake $CO_2$ | BECKMAN 864 Infrared Analyzer |
| Manifold vacuum | TYCO type AB 15 PSI transducer |
| Coolant exhaust temp. | OMEGA type K thermocouple; CJ compensator |
| Spark timing | 1.8K precision potentiometer |
| Peak cylinder press. | KISTLER 538A/601B1 Piezoelectric |
| Exhaust temp. AC | OMEGA type K thermocouple; CJ compensator |
| Exhaust temp. BC | OMEGA type K thermocouple; CJ compensator |
| Exhaust press. AC | TYCO type AB 6 PSI transducer |
| Exhaust press. BC | TYCO type AB 6 PSI transducer |

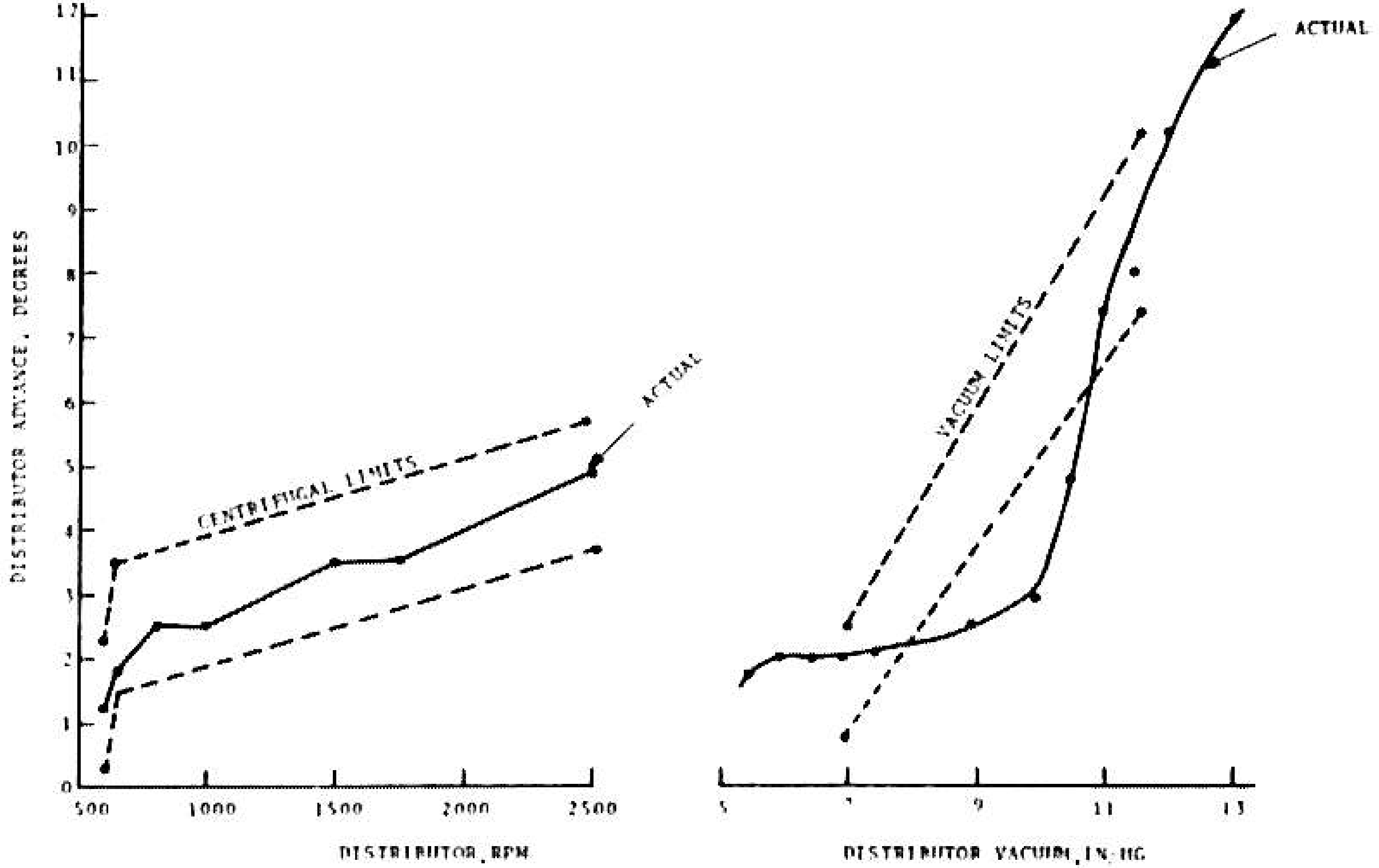

FIGURE 4. DISTRIBUTOR ADVANCE CHARACTERISTICS

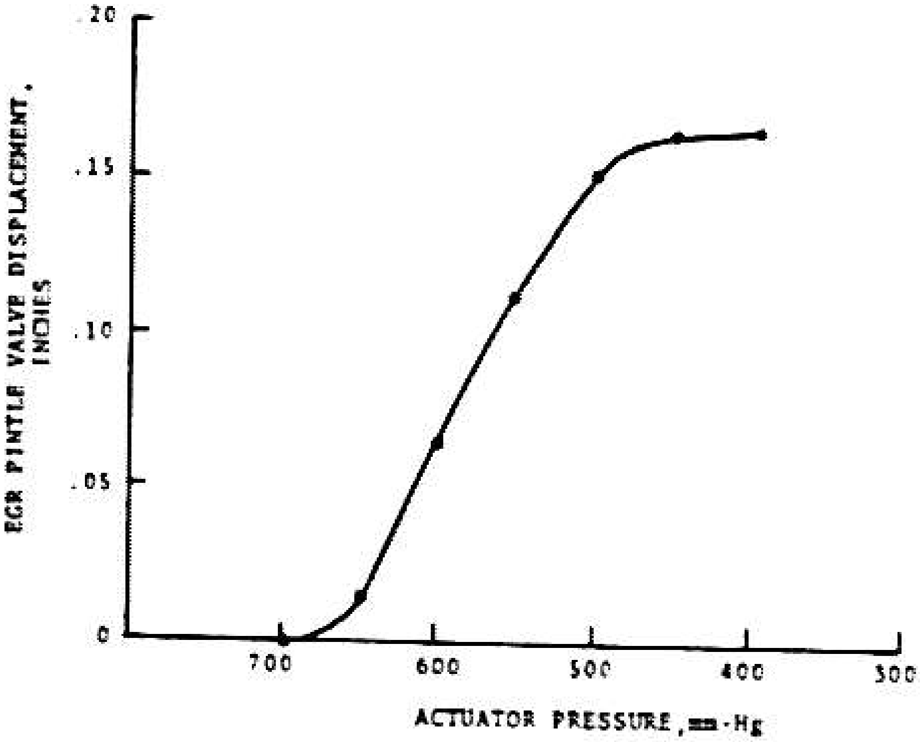

FIGURE 5. MEASURED VACUUM ACTUATOR

TABLE 5. STEADY-STATE BASELINE MAPPING SPEED-TORQUE VALUES

| ENGINE SPEED, (RPM) | TORQUE, (LB-FT) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 750 | -7, | 0, | 40 | | | | | | |
| 880 | -10, | -2, | 0, | 40, | 80, | 120, | 160 | | |
| 1000 | -15, | -10, | -5, | 0, | 40, | 80, | 120, | 160 | |
| 1500 | -25, | -10, | -5, | 0, | 40, | 80, | 120, | 160 | |
| 2000 | -32, | - 7, | 0, | 40, | 80, | 120, | 160 | | |
| 2500 | -30, | -10, | 0, | 40, | 80, | 120, | 160 | | |
| 3000 | -40, | -30, | -10, | 0, | 40, | 60, | 80, | 120, | 160 |
| 3600 | -48, | -36, | -12, | 0, | 35, | 70, | 105, | 140 | |

## 3. TEST PROCEDURES

All instrumentation was periodically checked and calibrated. Emissions instrumentation was calibrated before and after data collection at each power point, or every 30 minutes whichever came first. At each baseline test point, sufficient time was allowed for the operating temperatures and pressures to stabilize (typically 5 to 45 minutes) before data was collected. Each data channel was sampled 30 times in approximately 5 seconds and the data averaged.

## 4. DATA REDUCTION

The data acquisition system sampled the signals from the analog instrumentation shown in Table 4. All samples in each data set (speed/load point)were averaged and stored on the HP-21MX disc. Test variables were also displayed to the operator by video display and line-printer. The stored disc-data was subsequently transferred to magnetic tape for further reduction on a PDP-10 computer. All corrections to the test data and mass emissions and fuel-flow calculations were performed on the PDP-10 using the equations shown in Appendix A.

All corrected data was printed out in the format of Table B-1. The data includes Engine Speed (RPM), Load (torque) (lb-ft), the % EGR, the Air-Fuel Ratio (A/F) from exhaust and fuel-flow calculations, the exhaust concentrations (ppm or %), various temperatures and pressures, measured air flow to the engine (airflo), the humidity (grains/pound), and fuel flow (grams/second).

## 5. TEST RESULTS

Figure 6 gives the corrected bhp, torque, and BSFC at wide-open throttle (WOT) for this engine. The maximum horsepower and torque are within manufacturer's specifications. The BSFC is at a minimum at 1500 rpm. Figure 7 shows the fuel rate in lb/hr for all speed-load points. Figures 8 and 9 show the A-F ratio and EGR for all positive horsepower points. Distributor advance is shown in Figure 4, while CO, HC, and NOx mass emission rates as a functions of speed and load are given in Figures 10, 11, and 12.

At low power a lean mixture resulted in relatively low levels of CO and HC. At higher speeds and loads, with richer mixtures, CO and HC increased substantially. As expected, NOx increased at higher power points. In general, the results from this engine are typical of those obtained with a modern production engine. Attached as Appendix B is the test and reduced data for all positive and negative speed/load points.

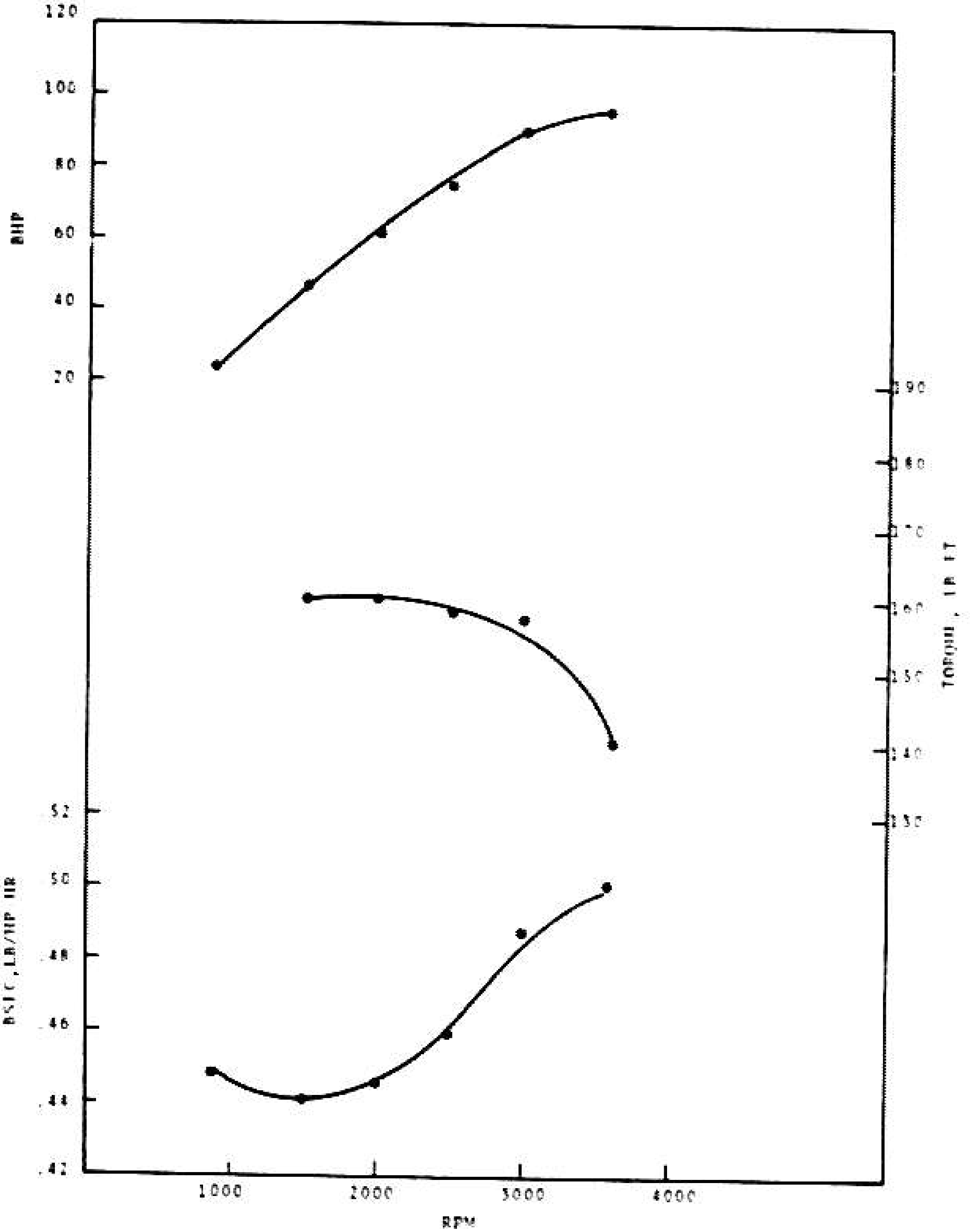

FIGURE 6. CORRECTED BHP,TORQUE, AND BSFC VS WIDE-OPEN THROTTLE

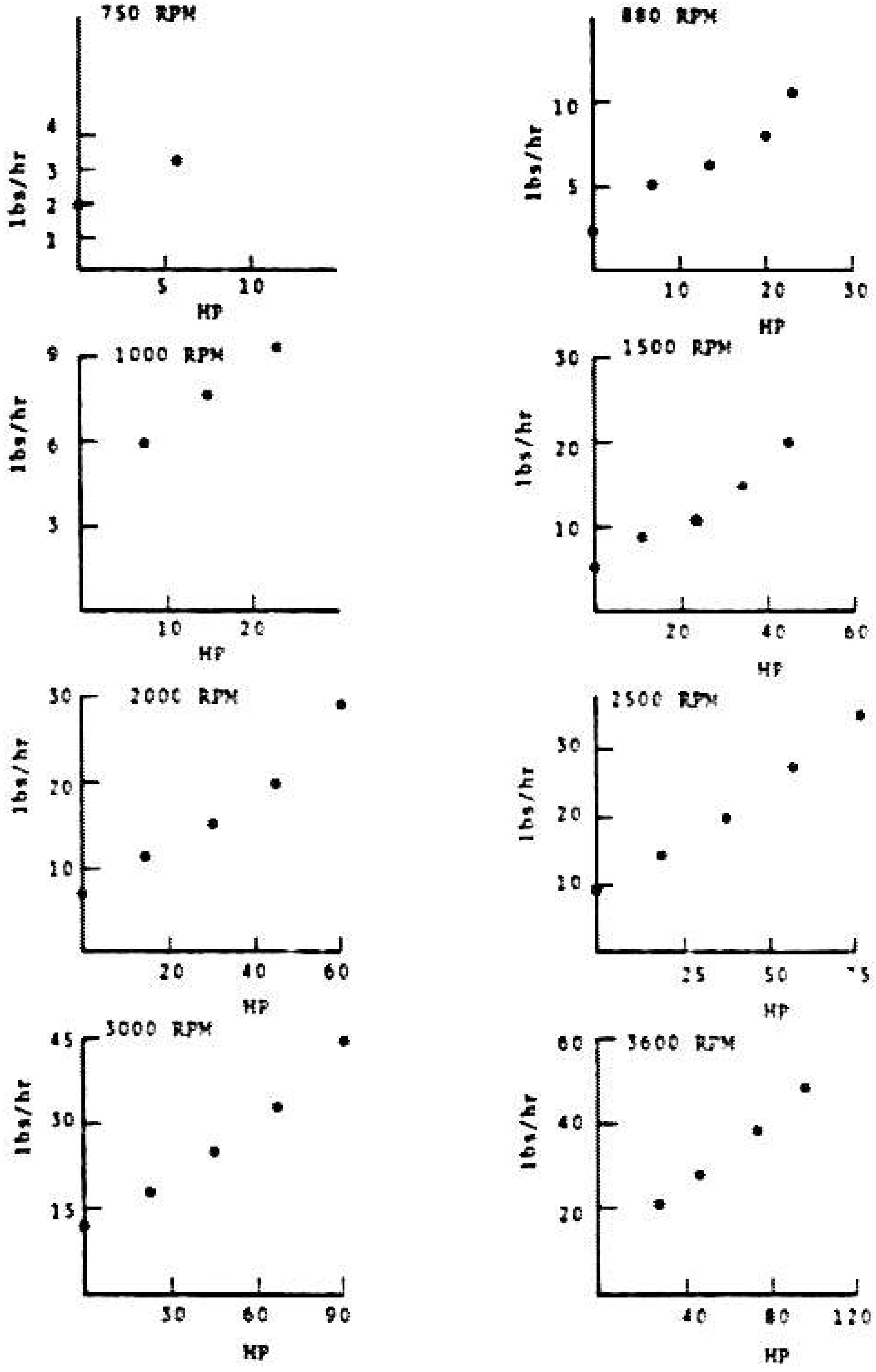

FIGURE 7. FUEL CONSUMPTION VS POWER

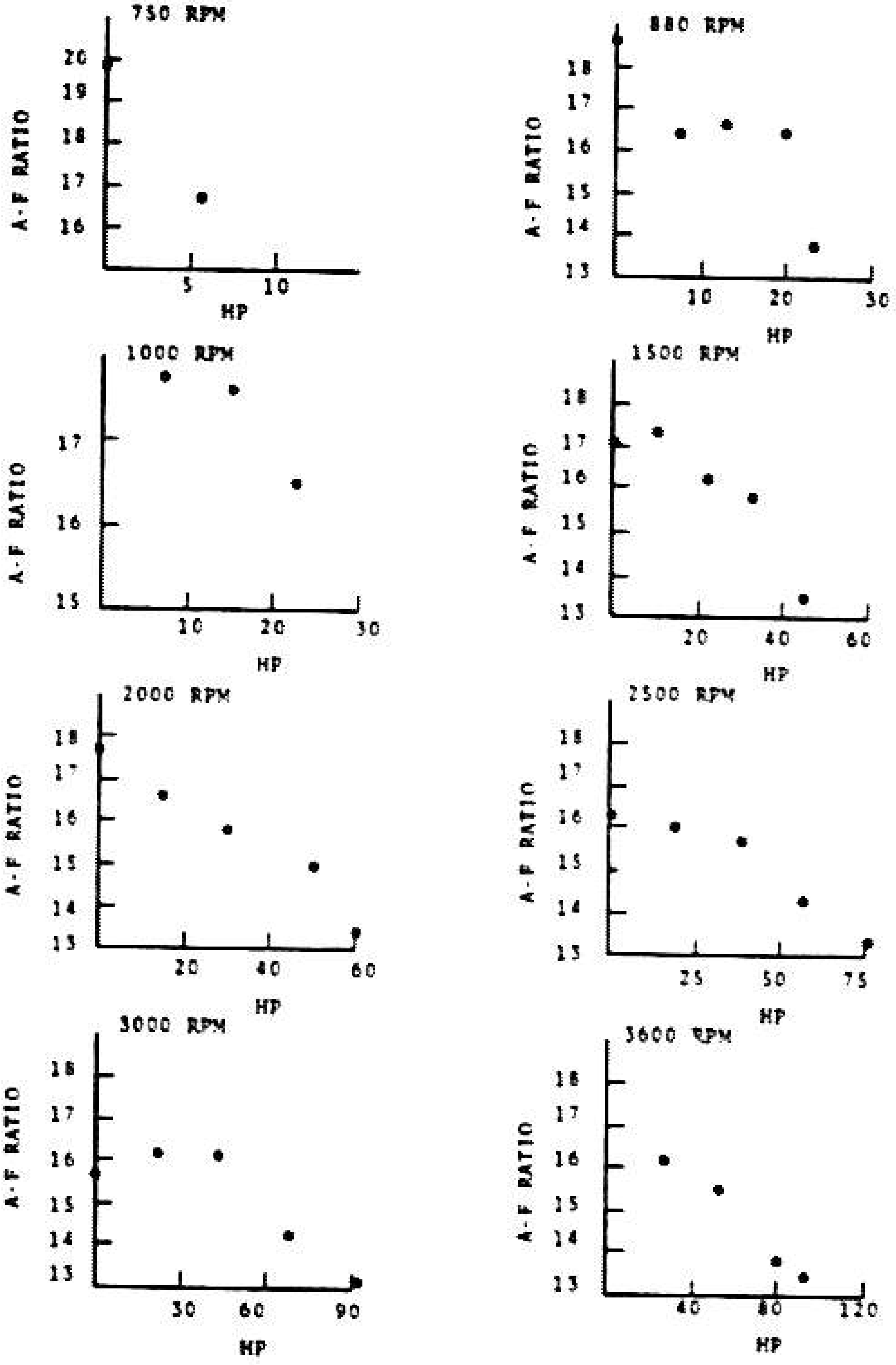

FIGURE 8. AIR-FUEL RATIO VS POWER

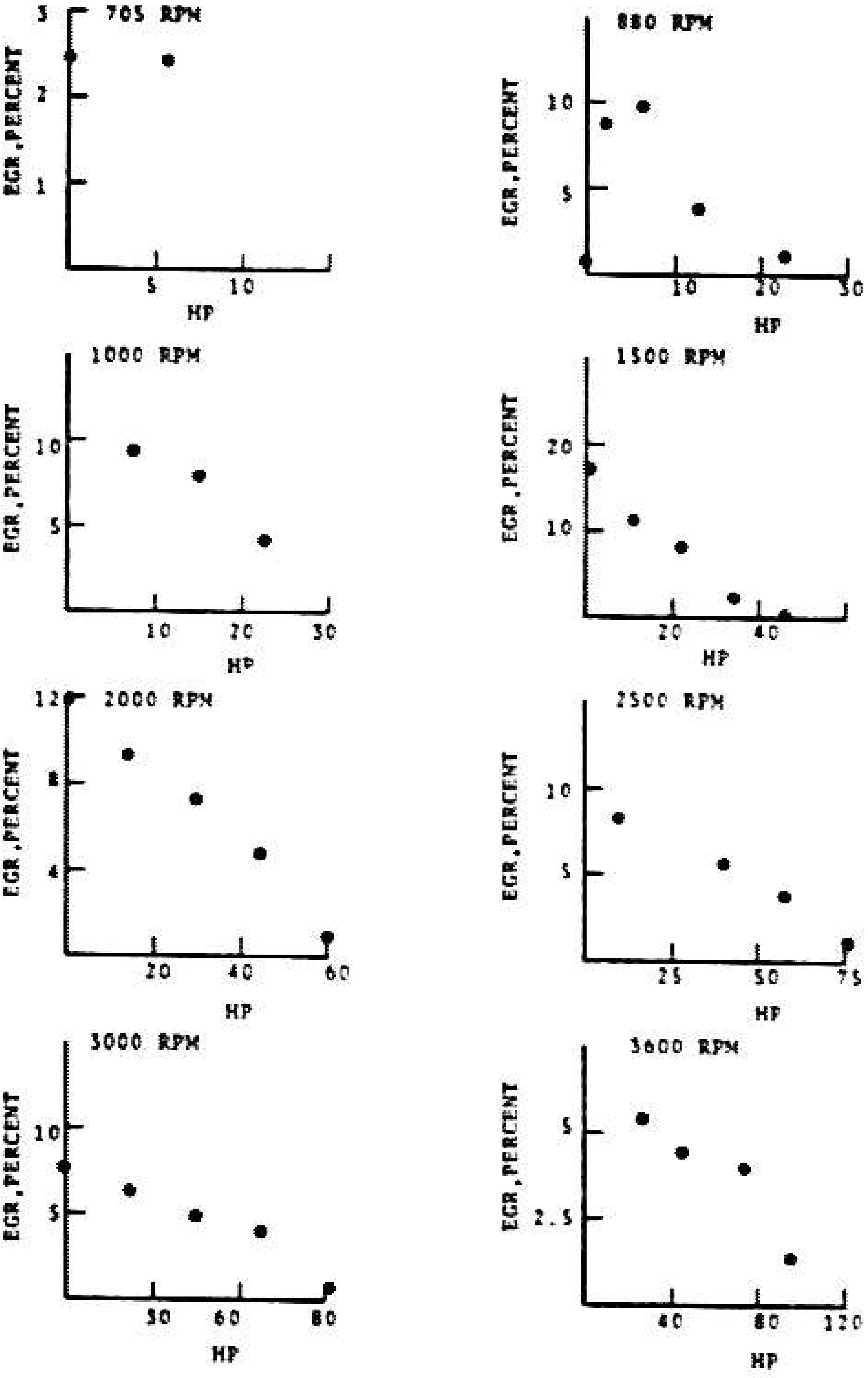

FIGURE 9. EGR VS POWER

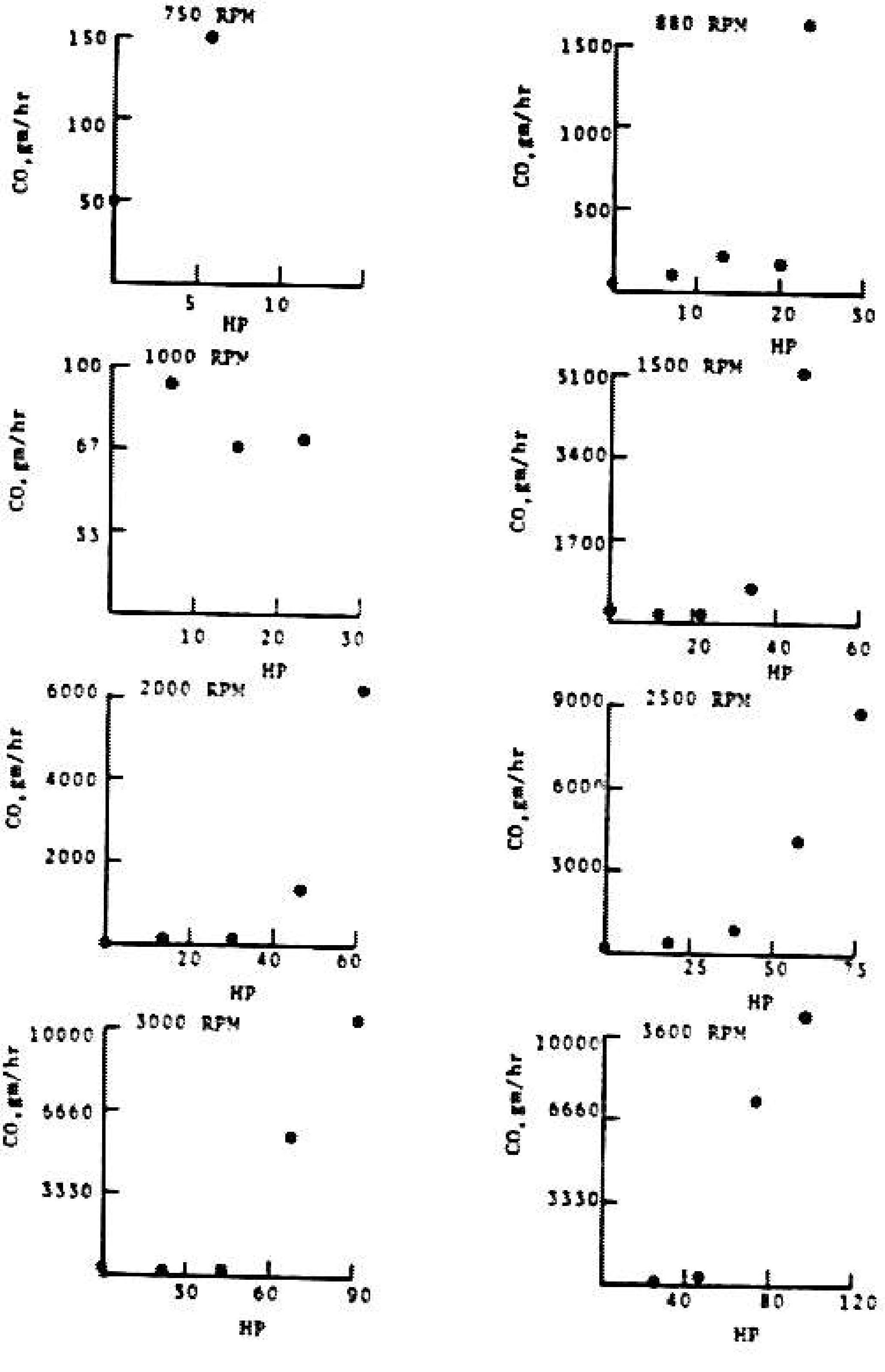

FIGURE 10. CO VS POWER

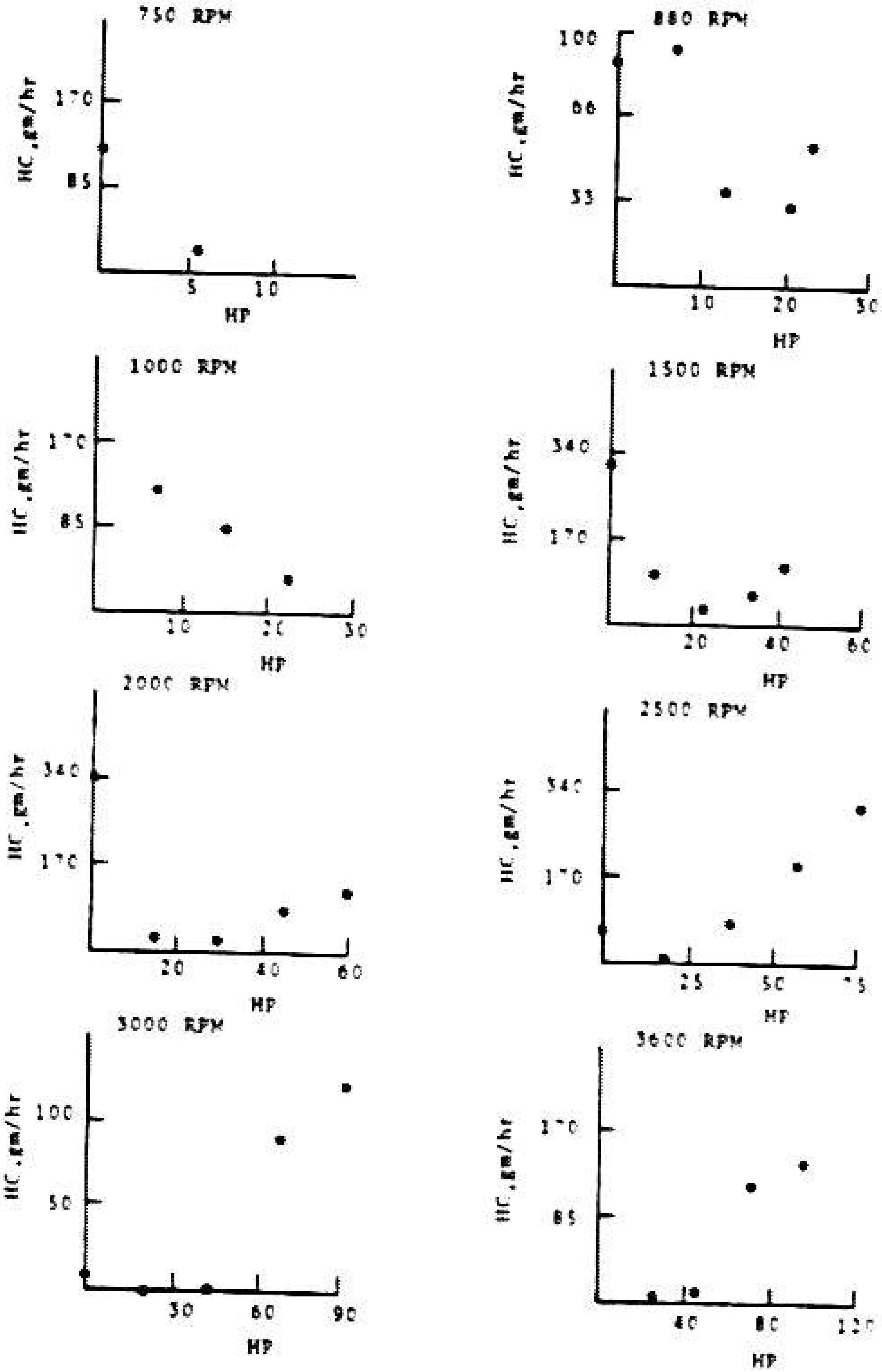

FIGURE 11. HC VS POWER

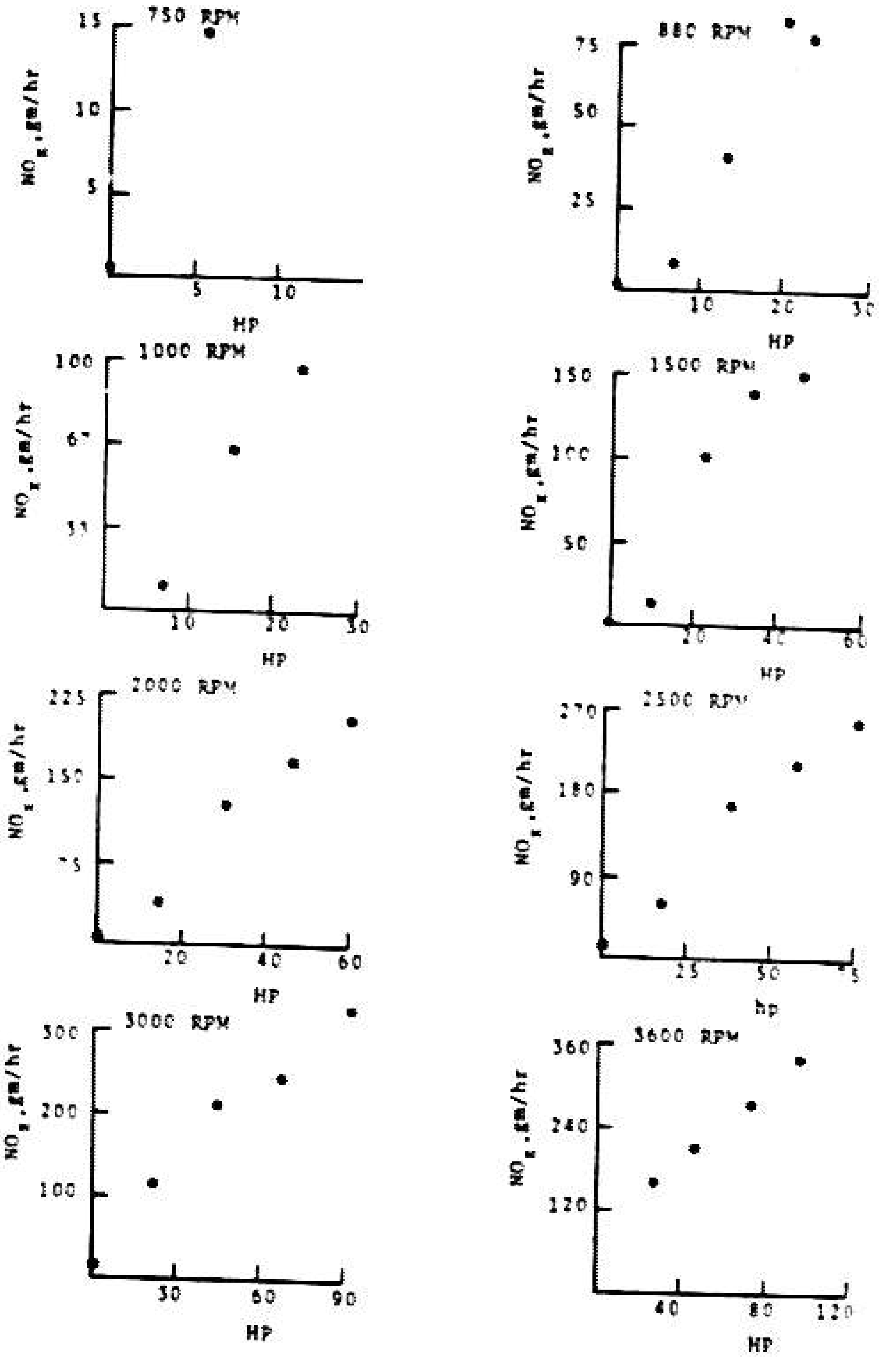

FIGURE 12. NOx VS POWER

# APPENDIX A

# DATA REDUCTION EQUATIONS

**CORRECTED TORQUE**, $T_c$ (lb-ft)[1] From SAE J245, Spark Ignition Engine Rating Code, adjusted to standard SAE ambient conditions

$$T_c = \frac{B_d^*}{B_{dt}} \left( \frac{t_t + A}{t^* + A} \right)^{1/2} T_t$$

where

$B_d^*$ = Standard Dry Barometric Pressure (29.00 in. Hg, 97.9 kPa)

$B_{dt}$ = Dry Barometric Pressure at Test Conditions

$t_t$ = Ambient Air Temperature at Test Conditions

$t^*$ = Standard Ambient Temperature (85°F, 29.4°C)

$A$ = Absolute Temperature Constant (460°R, 273°K)

$T_t$ = Measured Torque at Test Conditions.

**CORRECTED HORSEPOWER**, $hp_c$[1] From SAE J245, Spark Ignition Engine Rating Code, adjusted to standard SAE ambient conditions:

$$hp_c = \frac{T_c N}{G}$$

where

$T_c$ = Corrected Torque (See above.)

$N$ = Engine Speed (RPM)

$G$ = Power Constant (5252 English, 955 SI).

---

[1] Engines with manifold preheated air inlet systems are designed to control carburetor air inlet temperature to a specific temperature. Excursions in ambient temperature below this value do not appreciably affect the controlled temperature. The engine performance correction factor as described in SAE J245 Engine Rating Code for Spark Ignition Engines has therefore been updated as follows: If ambient temperature is less than or equal to the manufacturer's stated controlled temperatures, no correction component involving carburetor inlet temperature is made. If ambient temperature exceeds the targeted controlled temperature, the normal J245 correction factor is applied with the targeted controlled temperature used in place of the standard ambient temperature.

MASS FUEL FLOW RATE (lb/hr) From volumetric measurement (corrected to 60°F per ASTM petroleum tables) and fue specific gravity:

$$\dot{m}_f = \frac{(SpG)_f \left(\frac{lb\ H_2O}{vol}\right)(vol)_f}{\Delta t_T}$$

where

$\dot{m}_f$ = Fuel Flow Rate lb/hr

$(SpG)_f$ = Specific Gravity of Fuel

$(lb\ H_2O/vol)$ = Pounds of Water per Unit Volume

$(vol_f)$ = Volume of Fuel Measured, corrected to 60°F per ASTM petroleum tables

$\Delta t_T$ = Time interval of volume measurement (hrs.)

CORRECTED BRAKE SPECIFIC FUEL CONSUMPTION (BSFC) (lb/HP-hr)

$$BSFC_c = \frac{\dot{m}_f}{HP_c}$$

where

$BSFC_c$ = Corrected Brake Specific Fuel Consumption

$HP_c$ = Corrected Horsepower

$\dot{m}f$ = Mass Fuel Flow Rate (lb/hr).

AIR/FUEL RATIO (A/F) Based on emissions measurements from SPINDT, SAE #650507:

$$A/F = F_b \left[11.492\ F_c \left(\frac{1+R/2+Q}{1+R}\right) + \left(\frac{120(1-FC)}{3.5+R}\right)\right]$$

where

$$R = \frac{\%CO}{\%CO_2} = \frac{\text{Percent CO Concentration}}{\text{Percent CO}_2\text{ Concentration}}$$

$F_c$ = Mass Fraction of Carbon in Fuel

$$F_b = \frac{\%\ CO + CO_2}{\%\ CO + CO_2 + \%\ CH}$$

$$Q = \frac{\%\ O_2}{\%\ CO_2} = \frac{\text{Percent O}_2\text{ Concentration}}{\text{Percent CO}_2\text{ Concentration}}.$$

CARBON MONOXIDE (CO) MASS EMISSION RATE (Grams/Hr)

$$\text{MASS CO} = (4.383)\,(\dot{m}_f)(A/F+1)(\%CO)\left[\frac{1}{1 + 0.03148\,(\%\,CO_2)\,\dfrac{\%CO+CO_2}{\%CO+3\%CO_2}}\right]$$

where

$\dot{m}_f$ = Mass Fuel Flow Rate
A/F = Air-to-Fuel Ratio
% CO = Percent CO, Concentration
% $CO_2$ = Percent $CO_2$, Concentration.

HYDROCARBON (HC) MASS EMISSION RATE (Grams/Hr)

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

where

$\dot{m}_f$ = Mass Fuel Flow Rate
A/F = Air-to-Fuel Ratio
ppm HC = Parts per Million, HC Concentration.

OXIDES OF NITROGEN (NOx) MASS EMISSION RATE (Grams/Hr)

$$\text{Mass NOx} = 0.007201\,(\dot{m}_f)\,(A/F+1)\,(\text{ppm NOx})\left[\frac{1}{1 + .03148\,(\%\,CO_2)\left(\dfrac{\%CO+\%CO_2}{\%CO+3\%CO_2}\right)}\right]$$

where

$\dot{m}_f$ = Mass Fuel Flow Rate
A/F = Air-to-Fuel Ratio
ppm NOx = Parts per Million, NOx Concentration
% CO = Percent CO, Concentration
% $CO_2$ = Percent $CO_2$, Concentration
$K_H$ = Humidity Correction Factor.

HUMIDITY CORRECTION FACTOR

$$K_H = \frac{1}{1-.0047\,(\text{Absolute Humidity} - 75)}$$

where absolute humidity is in grains/pound of dry air.

<u>ABSOLUTE HUMIDITY (AH)</u> (Grains/Lb.Dry Air):

$$AH = \frac{(RH)\ P_{SU}}{1.608\ (P_{AMB} - RH \cdot P_{SU})}$$

where

$RH$ = Measured Relative Humidity

$P_{SU}$ = Saturated Vapor Pressure (from Keenan and Keyes Steam Tables)

$P_{AMB}$ = Ambient Barometric Pressure.

# APPENDIX B

# CHRYSLER 225 CID TEST DATA AND REDUCED TEST DATA

## EXPLANATION OF DATA COLUMN HEADINGS

| | |
|---|---|
| RPM | |
| CTORQ LB-FT | Torque corrected to standard conditions, SAE, J245 |
| EGR | |
| A/FEX | Air-to-Fuel ratio Calculated using Spindt method |
| A/FTC LB/HR | Air-to-Fuel ratio Calculated using total carbon method |
| CNOX PPM | Oxides of nitrogen corrected for relative humidity |
| HC PPM | Hydrocarbons, parts per million |
| CO | Carbon monoxide, percent |
| CO2 | Carbon dioxide, percent |
| O2 | Oxygen, percent |
| COOLE DEG-F | Exit engine coolant to heat exchanger |
| EXOIL DEG-F | Exit engine oil to heat exchanger |
| AIRDP INH2O | Pressure differential across Merriam airflow sensor |
| AIRFLO LB/MIN | Engine inlet airflow |
| ABSHUM GR/LB | Grains per pound |
| FLO G/S | Measured fuel flow, grams per second |

Note: Runs 1-85 were taken during warm-up.

# TABLE B-1. CHRYSLER 225 CID TEST DATA

MULTIPARAMETER ENGINE MAPPING SHORT FORM TEST SUMMARY OF FILE OPTION

| REL NUM | CONTROL CODE | TIME HHMMSS | RPM RPM | DYNMR LB-FT | EGR % | SPARK | SFUEL LB/HR | CNOX PPM | HC PPM | CO % | CO2 % | O2 % | COOLT DEG F | EXHST DEG F | MNVAC INH20 | AIRFLO LB/MIN | HUMDTY GR/LB | FLO G/S | DATE JUL YR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 909013 0 | 90342 | 1600 | 40 | 4.0 | 14.1 | 13.3 | 714 | 2161 | 2.00 | 12.4 | .5 | 188 | 188 | -.33 | 2.133 | 21.740 | 3.000 | 103 79 |
| 2 | 909013 0 | 90441 | 1600 | 40 | 4.1 | 14.1 | 13.3 | 720 | 2127 | 2.07 | 12.6 | .4 | 189 | 189 | -.33 | 2.129 | 21.940 | 3.000 | 103 79 |
| 3 | 909013 0 | 90547 | 1600 | 40 | 4.1 | 14.1 | 12.5 | 713 | 2241 | 1.91 | 12.5 | .4 | 189 | 189 | -.33 | 2.130 | 21.790 | 3.000 | 103 79 |
| 4 | 909033 0 | 90642 | 1600 | 40 | 4.1 | 14.1 | 13.3 | 711 | 2111 | 1.86 | 12.5 | .4 | 189 | 189 | -.33 | 2.133 | 21.590 | 3.000 | 103 79 |
| 5 | 909033 0 | 90743 | 1600 | 40 | 4.1 | 14.1 | 13.4 | 709 | 2094 | 1.67 | 12.5 | .4 | 189 | 188 | -.33 | 2.129 | 21.650 | 3.000 | 103 79 |
| 6 | 909033 0 | 90843 | 1600 | 40 | 4.1 | 14.2 | 13.3 | 712 | 2047 | 1.79 | 12.5 | .4 | 189 | 189 | -.33 | 2.129 | 22.000 | 3.000 | 103 79 |
| 7 | 909033 0 | 90944 | 1600 | 40 | 4.1 | 14.1 | 13.4 | 711 | 2050 | 1.80 | 12.5 | .4 | 189 | 189 | -.33 | 2.126 | 22.210 | 3.000 | 103 79 |
| 8 | 909033 0 | 91041 | 1600 | 40 | 4.1 | 14.2 | 13.3 | 717 | 2063 | 1.70 | 12.7 | .4 | 189 | 189 | -.33 | 2.119 | 22.490 | 3.000 | 103 79 |
| 9 | 909033 0 | 91142 | 1600 | 40 | 4.1 | 14.2 | 13.3 | 709 | 2101 | 1.76 | 12.5 | .4 | 188 | 189 | -.33 | 2.127 | 22.250 | 3.000 | 103 79 |
| 10 | 909033 0 | 91242 | 1600 | 40 | 4.1 | 14.2 | 13.3 | 709 | 2021 | 1.76 | 12.5 | .4 | 189 | 189 | -.33 | 2.129 | 22.310 | 3.000 | 103 79 |
| 11 | 909033 0 | 91341 | 1600 | 40 | 4.1 | 14.2 | 13.3 | 711 | 2093 | 1.71 | 12.5 | .4 | 188 | 189 | -.33 | 2.136 | 22.160 | 3.000 | 103 79 |
| 12 | 909033 0 | 91417 | 1600 | 40 | 4.1 | 14.2 | 13.3 | 707 | 2060 | 1.78 | 12.7 | .5 | 189 | 189 | -.34 | 2.139 | 22.200 | 3.000 | 103 79 |
| 13 | 909033 0 | 92042 | 1600 | 49 | 4.0 | 14.2 | 12.8 | 740 | 2207 | 2.14 | 12.4 | .7 | 190 | 188 | -.33 | 2.175 | 29.390 | 3.000 | 106 79 |
| 14 | 909033 0 | 92149 | 1600 | 49 | 4.1 | 14.2 | 12.5 | 740 | 2241 | 2.02 | 12.4 | .6 | 189 | 190 | -.33 | 2.169 | 29.900 | 3.000 | 106 79 |
| 15 | 909033 0 | 92244 | 1600 | 49 | 4.1 | 14.2 | 12.9 | 746 | 2271 | 1.95 | 12.3 | .4 | 189 | 188 | -.33 | 2.171 | 30.020 | 3.000 | 106 79 |
| 16 | 909033 0 | 92344 | 1600 | 49 | 4.0 | 14.2 | 13.6 | 745 | 1992 | 2.02 | 12.6 | .6 | 189 | 188 | -.33 | 2.159 | 30.260 | 3.000 | 106 79 |
| 17 | 909033 0 | 92444 | 1600 | 50 | 3.9 | 14.3 | 13.3 | 753 | 1941 | 1.85 | 12.5 | .6 | 188 | 188 | -.33 | 2.177 | 30.100 | 3.000 | 106 79 |
| 18 | 909033 0 | 92549 | 1600 | 49 | 4.1 | 14.7 | 13.6 | 749 | 1882 | 1.82 | 12.7 | .6 | 189 | 189 | -.33 | 2.160 | 29.900 | 3.000 | 106 79 |
| 19 | 909033 0 | 92645 | 1600 | 49 | 3.9 | 14.4 | 13.4 | 753 | 1922 | 1.73 | 12.6 | .6 | 188 | 189 | -.33 | 2.166 | 30.000 | 3.000 | 106 79 |
| 20 | 909033 0 | 92747 | 1600 | 49 | 4.1 | 14.3 | 13.4 | 754 | 2094 | 1.82 | 12.6 | .6 | 188 | 188 | -.33 | 2.177 | 29.790 | 3.000 | 106 79 |
| 21 | 909033 0 | 92844 | 1600 | 50 | 4.2 | 14.3 | 13.6 | 756 | 2127 | 1.89 | 12.5 | .6 | 187 | 189 | -.33 | 2.172 | 30.140 | 3.000 | 106 79 |
| 22 | 909033 0 | 92945 | 1600 | 50 | 4.2 | 14.3 | 13.3 | 757 | 1936 | 1.73 | 12.6 | .6 | 189 | 189 | -.33 | 2.163 | 30.000 | 3.000 | 106 79 |
| 23 | 909033 0 | 93044 | 1600 | 49 | 4.2 | 14.3 | 12.3 | 752 | 1907 | 1.83 | 12.5 | .6 | 189 | 189 | -.33 | 2.157 | 30.030 | 3.000 | 106 79 |
| 24 | 909033 0 | 93142 | 1600 | 49 | 4.0 | 14.3 | 13.3 | 751 | 2017 | 1.78 | 12.5 | .5 | 189 | 189 | -.33 | 2.170 | 30.100 | 3.000 | 106 79 |
| 25 | 909033 0 | 83601 | 1600 | 51 | .6 | 14.1 | 13.8 | 767 | 2271 | 2.76 | 12.0 | 1.0 | 192 | 186 | -.31 | 1.900 | 31.200 | 3.000 | 107 79 |
| 26 | 909033 0 | 83607 | 1600 | 51 | .6 | 14.1 | 13.8 | 769 | 2280 | 2.72 | 12.0 | 1.0 | 192 | 188 | -.30 | 1.909 | 31.120 | 3.000 | 107 79 |
| 27 | 909033 0 | 83610 | 1600 | 51 | .6 | 14.4 | 13.8 | 763 | 2284 | 2.71 | 12.0 | 1.0 | 192 | 186 | -.31 | 1.994 | 31.170 | 3.000 | 107 79 |
| 28 | 909033 0 | 83614 | 1600 | 51 | .6 | 14.1 | 13.8 | 764 | 2288 | 2.75 | 11.9 | 1.0 | 192 | 188 | -.31 | 1.998 | 31.040 | 3.000 | 107 79 |
| 29 | 909033 0 | 83619 | 1600 | 51 | .6 | 14.1 | 13.0 | 765 | 2250 | 2.71 | 12.0 | .9 | 193 | 186 | -.31 | 1.993 | 31.070 | 3.000 | 107 79 |
| 30 | 909033 0 | 83623 | 1600 | 51 | .5 | 14.1 | 13.1 | 765 | 2251 | 2.63 | 12.0 | .9 | 193 | 186 | -.31 | 1.997 | 31.000 | 3.000 | 107 79 |
| 31 | 909033 0 | 90000 | 1600 | 51 | .6 | 14.1 | 13.1 | 759 | 2064 | 2.41 | 12.1 | .7 | 189 | 188 | -.31 | 1.993 | 31.070 | 3.000 | 107 79 |
| 32 | 909033 0 | 90300 | 1600 | 51 | 3.9 | 14.0 | 13.1 | 775 | 2067 | 2.31 | 12.0 | .7 | 189 | 188 | -.30 | 1.930 | 31.000 | 3.000 | 107 79 |
| 33 | 909033 0 | 90342 | 1600 | 51 | 3.9 | 14.1 | 13.2 | 710 | 2000 | 2.45 | 12.1 | .7 | 189 | 188 | -.30 | 1.933 | 31.140 | 3.000 | 107 79 |
| 34 | 909033 0 | 90517 | 1600 | 51 | 3.9 | 14.0 | 13.2 | 772 | 2071 | 2.30 | 12.1 | .7 | 189 | 188 | -.30 | 1.933 | 31.150 | 3.000 | 107 79 |
| 35 | 909033 0 | 90524 | 1600 | 51 | 3.9 | 14.1 | 13.1 | 733 | 2096 | 2.47 | 12.1 | .7 | 189 | 188 | -.30 | 1.934 | 31.100 | 3.000 | 107 79 |
| 36 | 909033 0 | 90827 | 1600 | 49 | 6.6 | 14.4 | 13.3 | 770 | 2101 | 2.37 | 12.0 | 1.2 | 189 | 187 | -.49 | 1.900 | 31.100 | 3.000 | 107 79 |
| 37 | 909033 0 | 90833 | 1600 | 49 | 4.6 | 14.3 | 12.5 | 756 | 2201 | 2.31 | 11.9 | 1.2 | 188 | 189 | -.49 | 1.913 | 31.070 | 3.000 | 107 79 |
| 38 | 909033 0 | 90837 | 1600 | 50 | 4.5 | 14.4 | 12.3 | 776 | 2276 | 2.37 | 12.0 | 1.2 | 188 | 189 | -.49 | 1.917 | 30.790 | 3.000 | 107 79 |
| 39 | 909033 0 | 90842 | 1600 | 50 | 4.5 | 14.4 | 13.1 | 755 | 2143 | 2.41 | 12.0 | 1.2 | 189 | 189 | -.49 | 1.900 | 30.710 | 3.000 | 107 79 |
| 40 | 909033 0 | 90846 | 1600 | 49 | 6.6 | 14.3 | 12.8 | 797 | 2295 | 2.44 | 12.0 | 1.2 | 189 | 189 | -.49 | 1.910 | 30.710 | 3.000 | 107 79 |
| 41 | 909033 0 | 91000 | 1600 | 49 | 4.3 | 14.3 | 13.2 | 756 | 2145 | 2.52 | 12.0 | 1.1 | 188 | 189 | -.49 | 1.915 | 31.170 | 3.000 | 107 79 |
| 42 | 909033 0 | 91004 | 1600 | 49 | 6.6 | 14.3 | 13.3 | 756 | 2101 | 2.47 | 12.0 | 1.1 | 188 | 189 | -.49 | 1.933 | 31.210 | 3.000 | 107 79 |
| 43 | 909033 0 | 91009 | 1600 | 49 | 4.5 | 14.3 | 12.9 | 757 | 2172 | 2.51 | 11.9 | 1.1 | 188 | 189 | -.49 | 1.914 | 31.100 | 3.000 | 107 79 |
| 44 | 909033 0 | 91014 | 1600 | 49 | 6.6 | 14.3 | 12.9 | 756 | 2101 | 2.48 | 11.9 | 1.1 | 188 | 189 | -.49 | 1.911 | 31.190 | 3.000 | 107 79 |
| 45 | 909033 0 | 91133 | 1600 | 51 | 4.4 | 14.3 | 13.6 | 752 | 2137 | 2.15 | 12.0 | 1.0 | 189 | 189 | -.50 | 1.950 | 31.200 | 3.000 | 107 79 |
| 46 | 909033 0 | 91137 | 1600 | 51 | 4.4 | 14.3 | 13.8 | 751 | 2077 | 2.66 | 12.0 | 1.0 | 188 | 189 | -.50 | 1.949 | 31.110 | 3.000 | 107 79 |
| 47 | 909033 0 | 91142 | 1600 | 51 | 4.4 | 14.3 | 13.6 | 753 | 2057 | 2.17 | 12.0 | 1.0 | 188 | 189 | -.50 | 1.949 | 31.110 | 3.000 | 107 79 |
| 48 | 909033 0 | 91146 | 1600 | 51 | 4.4 | 14.3 | 13.6 | 774 | 2073 | 2.19 | 12.0 | 1.0 | 189 | 189 | -.50 | 1.934 | 31.200 | 3.000 | 107 79 |

## TABLE B-1. CHRYSLER 225 CID TEST DATA (CONTD)

# TABLE B-1. CHRYSLER 225 CID TEST DATA (CONTD)

| SEQ NUM | NOMINAL COND | | TIME HHMMSS | RPM | CTORQ LB-FT | EGR % | A/FER | [illegible] | NOX PPM | HC PPM | CO % | CO2 % | O2 % | COOLT DEG-F | EXOIL DEG-F | [illegible] | AIRFLO LB/MIN | [illegible] | F/A | DATE JUL YR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 104 | 902117 | 0 | 100730 | 1992 | 18 | 9.6 | 15.8 | 16.9 | 363 | 307 | .10 | 12.8 | 2.1 | 190 | 193 | -.70 | 1.130 | 17.730 | 1.901 | 123 79 |
| 105 | 902117 | 0 | 100736 | 1994 | 18 | 9.3 | 16.0 | 16.3 | 355 | 369 | .10 | 12.6 | 2.2 | 190 | 193 | -.70 | 1.160 | 17.610 | 1.679 | 123 79 |
| 106 | 902117 | 0 | 100738 | 1993 | 18 | 9.7 | 15.8 | 16.7 | 360 | 677 | .10 | 12.7 | 2.2 | 189 | 193 | -.70 | 1.144 | 17.700 | 1.675 | 123 79 |
| 107 | 902117 | 0 | 100743 | 1991 | 18 | 9.4 | 16.0 | 16.3 | 361 | 640 | .10 | 12.6 | 2.2 | 189 | 193 | -.70 | 1.144 | 17.810 | 1.670 | 123 79 |
| 108 | 902219 | 0 | 101527 | 2000 | 3 | 12.1 | 17.6 | 1.0 | 46 | 11700 | .33 | 10.2 | 5.3 | 190 | 191 | -.31 | 2.035 | 17.480 | 1.061 | 123 79 |
| 109 | 902219 | 0 | 101531 | 2000 | 3 | 12.0 | 17.7 | 1.0 | 46 | 11630 | .33 | 10.2 | 5.3 | 190 | 191 | -.31 | 2.033 | 17.560 | 1.033 | 123 79 |
| 110 | 902219 | 0 | 101539 | 2000 | 3 | 11.9 | 17.6 | 1.0 | 47 | 12000 | .34 | 10.2 | 5.3 | 190 | 191 | -.31 | 2.047 | 17.730 | 1.066 | 123 79 |
| 111 | 902219 | 0 | 101544 | 2001 | 3 | 12.0 | 17.6 | 1.0 | 43 | 11500 | .34 | 10.3 | 5.3 | 190 | 191 | -.31 | 2.030 | 17.770 | 1.063 | 123 79 |
| 112 | 902219 | 0 | 101548 | 2000 | 3 | 12.0 | 17.7 | 1.0 | 45 | 11140 | .35 | 10.3 | 5.2 | 190 | 191 | -.31 | 2.060 | 17.840 | 1.071 | 123 79 |
| 113 | 902219 | 0 | 101553 | 2000 | 3 | 12.0 | 17.6 | 1.0 | 46 | 12000 | .36 | 10.2 | 5.3 | 190 | 191 | -.31 | 2.049 | 17.870 | 1.063 | 123 79 |
| 114 | 902219 | 0 | 101557 | 2000 | 3 | 12.0 | 17.9 | 1.0 | 44 | 11850 | .35 | 10.0 | 5.2 | 190 | 191 | -.31 | 2.036 | 17.770 | 1.062 | 123 79 |
| 115 | 902219 | 0 | 101601 | 2000 | 3 | 12.1 | 17.9 | 1.0 | 43 | 11730 | .35 | 10.3 | 5.2 | 190 | 191 | -.31 | 2.035 | 17.300 | 1.066 | 123 79 |
| 116 | 902219 | 0 | 101606 | 2000 | 3 | 12.1 | 17.6 | 1.0 | 47 | 11680 | .37 | 10.2 | 5.2 | 190 | 191 | -.31 | 2.062 | 17.330 | 1.073 | 123 79 |
| 117 | 902219 | 0 | 101614 | 2000 | 3 | 12.0 | 17.9 | 1.0 | 43 | 12000 | .36 | 10.2 | 5.3 | 190 | 191 | -.31 | 2.036 | 17.320 | 1.069 | 123 79 |
| 118 | 902219 | 0 | 101617 | 2000 | 3 | 12.0 | 17.8 | 1.0 | 41 | 11910 | .34 | 10.2 | 5.3 | 190 | 191 | -.31 | 2.039 | 17.400 | 1.071 | 123 79 |
| 119 | 901917 | 0 | 103122 | 2000 | 120 | 4.7 | 15.1 | 14.4 | 741 | 1069 | .97 | 12.0 | 1.0 | 192 | 194 | -1.22 | 4.937 | 16.450 | 2.904 | 123 79 |
| 120 | 901917 | 0 | 103127 | 2000 | 120 | 4.6 | 15.1 | 14.4 | 742 | 1072 | 1.00 | 12.1 | 1.0 | 192 | 194 | -1.22 | 4.900 | 16.340 | 2.907 | 123 79 |
| 121 | 901917 | 0 | 103138 | 2000 | 119 | 4.6 | 15.0 | 14.3 | 740 | 1059 | 1.04 | 12.0 | 1.0 | 190 | 194 | -1.22 | 4.926 | 16.130 | 2.884 | 123 79 |
| 122 | 901917 | 0 | 103143 | 2000 | 119 | 4.7 | 15.0 | 14.3 | 740 | 1050 | 1.04 | 12.0 | 1.0 | 189 | 194 | -1.21 | 4.920 | 16.000 | 2.882 | 123 79 |
| 123 | 901917 | 0 | 103147 | 2000 | 119 | 4.7 | 15.0 | 14.3 | 741 | 1060 | 1.04 | 12.1 | 1.0 | 188 | 195 | -1.22 | 4.937 | 16.020 | 2.861 | 123 79 |
| 124 | 901917 | 0 | 103151 | 2000 | 119 | 4.9 | 15.0 | 14.2 | 738 | 1067 | 1.01 | 12.1 | 1.0 | 188 | 194 | -1.22 | 4.930 | 16.010 | 2.888 | 123 79 |
| 125 | 901917 | 0 | 103156 | 2000 | 119 | 4.8 | 15.0 | 14.3 | 739 | 1065 | 1.01 | 12.1 | 1.0 | 188 | 194 | -1.23 | 4.995 | 16.090 | 2.871 | 123 79 |
| 126 | 901917 | 0 | 103200 | 2000 | 119 | 4.8 | 15.0 | 14.2 | 740 | 1059 | 1.07 | 12.1 | 1.0 | 189 | 195 | -1.22 | 4.990 | 16.060 | 2.870 | 123 79 |
| 127 | 901917 | 0 | 103204 | 2000 | 119 | 4.8 | 15.0 | 14.3 | 739 | 1059 | 1.09 | 12.0 | 1.0 | 190 | 195 | -1.22 | 4.903 | 16.030 | 2.890 | 123 79 |
| 128 | 901917 | 0 | 103208 | 2000 | 119 | 4.8 | 15.0 | 14.2 | 738 | 1051 | 1.07 | 12.0 | 1.0 | 191 | 194 | -1.22 | 4.937 | 15.990 | 2.880 | 123 79 |
| 129 | 901815 | 0 | 103556 | 2000 | 159 | 1.1 | 13.6 | 13.2 | 734 | 1407 | 3.41 | 11.5 | .7 | 188 | 196 | -1.31 | 6.100 | 15.960 | 4.061 | 123 79 |
| 130 | 901815 | 0 | 103600 | 2000 | 160 | 1.0 | 13.6 | 13.2 | 735 | 1406 | 3.38 | 11.5 | .7 | 188 | 196 | -1.31 | 6.120 | 15.900 | 3.932 | 123 79 |
| 131 | 901815 | 0 | 103604 | 2000 | 160 | .9 | 13.6 | 13.2 | 734 | 1390 | 3.39 | 11.5 | .7 | 188 | 196 | -1.32 | 6.041 | 15.840 | 3.890 | 123 79 |
| 132 | 901815 | 0 | 103608 | 2000 | 160 | .9 | 13.6 | 13.2 | 734 | 1400 | 3.41 | 11.5 | .7 | 189 | 196 | -1.32 | 6.136 | 15.730 | 3.890 | 123 79 |
| 133 | 901815 | 0 | 103612 | 2000 | 160 | .9 | 13.6 | 13.1 | 734 | 1394 | 3.44 | 11.5 | .7 | 190 | 196 | -1.31 | 6.119 | 15.830 | 3.932 | 123 79 |
| 134 | 901815 | 0 | 103616 | 2000 | 160 | .9 | 13.6 | 13.2 | 734 | 1398 | 3.43 | 11.5 | .6 | 191 | 196 | -1.32 | 6.146 | 15.720 | 3.940 | 123 79 |
| 135 | 901815 | 0 | 103620 | 2000 | 160 | .9 | 13.6 | 13.2 | 731 | 1390 | 3.44 | 11.5 | .6 | 191 | 196 | -1.32 | 6.137 | 15.340 | 3.933 | 123 79 |
| 136 | 901815 | 0 | 103626 | 2000 | 160 | .9 | 13.6 | 13.2 | 732 | 1399 | 3.45 | 11.5 | .6 | 192 | 196 | -1.32 | 6.130 | 15.530 | 3.933 | 123 79 |
| 137 | 901815 | 0 | 103630 | 2000 | 160 | .9 | 13.6 | 13.1 | 732 | 1401 | 3.41 | 11.5 | .6 | 192 | 196 | -1.32 | 6.142 | 15.390 | 3.947 | 123 79 |
| 138 | 901815 | 0 | 103633 | 2000 | 160 | .9 | 13.6 | 13.1 | 732 | 1404 | 3.41 | 11.5 | .6 | 191 | 196 | -1.32 | 6.182 | 15.670 | 3.970 | 123 79 |
| 139 | 902616 | 0 | 104130 | 2500 | 159 | .7 | 13.4 | 13.1 | 730 | 1227 | 4.11 | 11.2 | .7 | 187 | 199 | -1.97 | 7.930 | 14.810 | 5.057 | 123 79 |
| 140 | 902616 | 0 | 104134 | 2500 | 159 | .8 | 13.6 | 13.1 | 725 | 1224 | 4.14 | 11.2 | .6 | 187 | 200 | -1.98 | 7.991 | 15.660 | 5.137 | 123 79 |
| 141 | 902616 | 0 | 104138 | 2500 | 159 | .8 | 13.6 | 13.1 | 726 | 1226 | 4.14 | 11.1 | .6 | 189 | 199 | -1.96 | 7.917 | 15.880 | 5.140 | 123 79 |
| 142 | 902616 | 0 | 104144 | 2500 | 159 | .8 | 13.6 | 13.2 | 727 | 1231 | 4.14 | 11.1 | .6 | 192 | 199 | -1.96 | 7.982 | 15.660 | 5.190 | 123 79 |
| 143 | 902616 | 0 | 104205 | 2500 | 157 | 1.0 | 13.4 | 13.2 | 726 | 1232 | 4.10 | 11.2 | .6 | 188 | 199 | -1.96 | 7.827 | 15.370 | 5.182 | 123 79 |
| 144 | 902616 | 0 | 104214 | 2500 | 157 | 1.1 | 13.6 | 13.1 | 725 | 1238 | 4.07 | 11.2 | .6 | 188 | 200 | -1.95 | 7.848 | 14.850 | 5.160 | 123 79 |
| 145 | 902616 | 0 | 104219 | 2500 | 157 | 1.0 | 13.4 | 13.1 | 726 | 1235 | 4.09 | 11.2 | .6 | 189 | 200 | -1.95 | 7.841 | 14.780 | 5.137 | 123 79 |
| 146 | 902616 | 0 | 104223 | 2500 | 158 | 1.1 | 13.4 | 13.1 | 724 | 1247 | 4.09 | 11.2 | .6 | 191 | 200 | -1.96 | 7.889 | 14.980 | 5.096 | 123 79 |
| 147 | 902616 | 0 | 104227 | 2500 | 158 | 1.1 | 13.4 | 13.1 | 725 | 1242 | 4.10 | 11.2 | .6 | 193 | 200 | -1.96 | 7.824 | 15.870 | 5.105 | 123 79 |
| 148 | 902616 | 0 | 104231 | 2500 | 158 | 1.1 | 13.4 | 13.1 | 729 | 1249 | 4.12 | 11.2 | .6 | 193 | 199 | -1.95 | 7.839 | 15.420 | 5.148 | 123 79 |
| 149 | 902616 | 0 | 104235 | 2500 | 158 | 1.1 | 13.4 | 13.1 | 726 | 1237 | 4.15 | 11.2 | .6 | 192 | 199 | -1.95 | 7.810 | 15.760 | 5.139 | 123 79 |
| 150 | 902616 | 0 | 104239 | 2500 | 158 | 1.1 | 13.4 | 13.1 | 727 | 1217 | 4.13 | 11.2 | .6 | 190 | 199 | -1.94 | 7.822 | 15.910 | 5.099 | 123 79 |
| 151 | 902616 | 0 | 104243 | 2500 | 156 | 1.1 | 13.4 | 13.1 | 727 | 1235 | 4.11 | 11.2 | .6 | 188 | 199 | -1.94 | 7.820 | 16.120 | 5.117 | 123 79 |
| 152 | 902616 | 0 | 104247 | 2500 | 158 | 1.0 | 13.4 | 13.1 | 728 | 1271 | 4.11 | 11.2 | .6 | 187 | 200 | -1.94 | 7.820 | 16.190 | 5.156 | 123 79 |
| 153 | 902716 | 0 | 104626 | 2500 | 122 | 3.9 | 14.1 | 13.0 | 719 | 1060 | 2.34 | 12.1 | .9 | 191 | 200 | -1.61 | 6.471 | 15.920 | 3.971 | 123 79 |
| 154 | 902716 | 0 | 104630 | 2500 | 121 | 3.8 | 14.2 | 13.0 | 719 | 1061 | 2.32 | 12.1 | .9 | 192 | 200 | -1.61 | 6.481 | 15.790 | 3.969 | 123 79 |
| 155 | 902716 | 0 | 104634 | 2500 | 121 | 3.8 | 14.4 | 13.0 | 719 | 1060 | 2.31 | 12.1 | .9 | 191 | 199 | -1.61 | 6.490 | 15.730 | 3.977 | 123 79 |
| 156 | 902716 | 0 | 104638 | 2500 | 121 | 3.8 | 14.3 | 13.0 | 718 | 1057 | 2.32 | 12.1 | .9 | 189 | 200 | -1.61 | 6.475 | 15.670 | 3.990 | 123 79 |
| 157 | 902716 | 0 | 104642 | 2500 | 121 | 3.8 | 14.4 | 13.0 | 718 | 1056 | 2.29 | 12.4 | .9 | 188 | 200 | -1.61 | 6.476 | 15.570 | 3.964 | 123 79 |
| 158 | 902716 | 0 | 104638 | 2500 | 121 | 3.8 | 14.4 | 12.9 | 717 | 1066 | 2.20 | 12.4 | .9 | 191 | 200 | -1.60 | 6.430 | 15.790 | 3.983 | 123 79 |

# TABLE B-1. CHRYSLER 225 CID TEST DATA (CONTD)

| REC NUM | NOMINAL CODE | TIME HHMMSS | RPM | TORQ LB FT | EGR % | A/F RATIO | W/FUEL LB/HR | NOX PPM | HC PPM | CO % | CO2 % | O2 % | COOLT DEG-F | OIL T DEG-F | MANVAC INHG | AIRFLO LB/MIN | HUMID GR/LB | F/A G/S | DATE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 159 | 902716 0 | 104702 | 2500 | 121 | 3.0 | 14.7 | 13.0 | 710 | 1070 | 2.33 | 12.3 | .0 | 192 | 200 | -1.61 | 8.449 | 16.110 | 2.962 | 123 79 |
| 160 | 902716 0 | 104707 | 2500 | 121 | 1.0 | 14.3 | 13.0 | 720 | 1050 | 2.31 | 12.3 | .0 | 192 | 200 | -1.63 | 8.549 | 16.260 | 2.963 | 123 79 |
| 161 | 902716 0 | 104711 | 2500 | 121 | 1.0 | 14.4 | 13.0 | 719 | 1069 | 2.28 | 12.4 | .0 | 192 | 199 | -1.62 | 8.509 | 16.370 | 2.970 | 123 79 |
| 162 | 902716 0 | 104714 | 2500 | 121 | 1.0 | 14.3 | 13.0 | 719 | 1066 | 2.32 | 12.3 | .0 | 190 | 200 | -1.61 | 8.471 | 16.430 | 2.973 | 123 79 |
| 163 | 902016 0 | 105213 | 2500 | 85 | 5.6 | 15.6 | 15.1 | 707 | 530 | .56 | 13.1 | 1.5 | 190 | 199 | -1.32 | 5.301 | 16.780 | 2.881 | 123 79 |
| 164 | 902016 0 | 105217 | 2500 | 84 | 5.6 | 15.6 | 15.1 | 707 | 511 | .58 | 13.1 | 1.5 | 191 | 199 | -1.32 | 5.289 | 16.970 | 2.850 | 123 79 |
| 165 | 902016 0 | 105221 | 2500 | 85 | 5.6 | 15.6 | 15.1 | 708 | 511 | .59 | 13.1 | 1.5 | 192 | 199 | -1.33 | 5.320 | 17.080 | 2.830 | 123 79 |
| 166 | 902016 0 | 105225 | 2500 | 85 | 5.6 | 15.6 | 15.1 | 704 | 510 | .57 | 13.1 | 1.5 | 192 | 199 | -1.33 | 5.304 | 17.100 | 2.851 | 123 79 |
| 167 | 902016 0 | 105229 | 2500 | 84 | 5.6 | 15.6 | 15.1 | 708 | 527 | .56 | 13.1 | 1.5 | 191 | 199 | -1.32 | 5.323 | 17.210 | 2.851 | 123 79 |
| 168 | 902016 0 | 105232 | 2500 | 85 | 5.6 | 15.7 | 15.1 | 708 | 511 | .58 | 13.1 | 1.5 | 190 | 199 | -1.32 | 5.314 | 17.140 | 2.837 | 123 79 |
| 169 | 902016 0 | 105236 | 2500 | 85 | 5.6 | 15.7 | 15.1 | 707 | 520 | .57 | 13.1 | 1.5 | 192 | 199 | -1.32 | 5.322 | 17.090 | 2.824 | 123 79 |
| 170 | 902016 0 | 105300 | 2500 | 84 | 5.6 | 15.7 | 15.1 | 707 | 509 | .59 | 13.2 | 1.5 | 192 | 199 | -1.32 | 5.270 | 17.210 | 2.950 | 123 79 |
| 171 | 902016 0 | 105304 | 2500 | 84 | 5.7 | 15.7 | 15.1 | 707 | 530 | .61 | 13.1 | 1.5 | 192 | 199 | -1.32 | 5.272 | 17.090 | 2.967 | 123 79 |
| 172 | 902016 0 | 105308 | 2500 | 84 | 5.6 | 15.7 | 15.1 | 708 | 547 | .59 | 13.1 | 1.5 | 191 | 199 | -1.32 | 5.273 | 16.810 | 3.142 | 123 79 |
| 173 | 902916 0 | 110424 | 2500 | 42 | .1 | 16.2 | 15.9 | 374 | 791 | .40 | 13.1 | 2.5 | 196 | 196 | -.90 | 3.934 | 17.000 | 1.998 | 123 79 |
| 174 | 902916 0 | 110428 | 2500 | 42 | .2 | 16.2 | 15.9 | 370 | 700 | .41 | 13.1 | 2.0 | 195 | 196 | -.99 | 3.959 | 16.870 | 2.007 | 123 79 |
| 175 | 902916 0 | 110432 | 2500 | 42 | .1 | 16.2 | 15.9 | 351 | 737 | .41 | 13.2 | 2.0 | 195 | 197 | -.90 | 3.949 | 16.780 | 1.999 | 123 79 |
| 176 | 902916 0 | 110436 | 2500 | 42 | .1 | 16.2 | 15.9 | 366 | 760 | .37 | 13.2 | 2.0 | 195 | 197 | -.90 | 3.924 | 16.890 | 1.996 | 123 79 |
| 177 | 902916 0 | 110440 | 2500 | 42 | .2 | 16.2 | 15.9 | 351 | 737 | .38 | 13.2 | 2.0 | 195 | 197 | -.90 | 3.927 | 17.170 | 1.992 | 123 79 |
| 178 | 902916 0 | 110502 | 2500 | 40 | .1 | 16.2 | 15.9 | 355 | 754 | .37 | 13.1 | 2.0 | 193 | 197 | -.97 | 3.891 | 17.330 | 1.953 | 123 79 |
| 179 | 902916 0 | 110511 | 2500 | 41 | .2 | 16.2 | 15.9 | 339 | 733 | .38 | 13.1 | 2.0 | 193 | 197 | -.97 | 3.900 | 17.300 | 1.940 | 123 79 |
| 180 | 902916 0 | 110515 | 2500 | 40 | .3 | 16.2 | 15.9 | 327 | 741 | .38 | 13.1 | 2.0 | 193 | 197 | -.97 | 3.898 | 17.400 | 2.030 | 123 79 |
| 181 | 902916 0 | 110522 | 2500 | 41 | .2 | 16.2 | 15.9 | 329 | 742 | .37 | 13.2 | 2.0 | 194 | 197 | -.97 | 3.893 | 17.430 | 2.130 | 123 79 |
| 182 | 902916 0 | 110526 | 2500 | 41 | .2 | 16.2 | 15.9 | 337 | 745 | .37 | 13.2 | 2.0 | 194 | 197 | -.97 | 3.894 | 11.420 | 2.099 | 123 79 |
| 183 | 903016 0 | 110927 | 2500 | 3 | 10.1 | 16.3 | 15.4 | 101 | 644 | .33 | 13.0 | 2.2 | 190 | 196 | -.65 | 2.613 | 17.360 | .645 | 123 79 |
| 184 | 903016 0 | 110931 | 2500 | 3 | 10.1 | 16.3 | 15.3 | 102 | 700 | .33 | 13.0 | 2.2 | 190 | 196 | -.65 | 2.607 | 17.730 | .320 | 123 79 |
| 185 | 903016 0 | 110935 | 2500 | 3 | 10.1 | 16.3 | 15.3 | 102 | 792 | .34 | 13.0 | 2.2 | 190 | 196 | -.65 | 2.610 | 17.740 | .884 | 123 79 |
| 186 | 903016 0 | 110939 | 2500 | 3 | 10.1 | 16.3 | 15.3 | 102 | 676 | .31 | 13.0 | 2.2 | 190 | 196 | -.66 | 2.619 | 17.390 | .873 | 123 79 |
| 187 | 903016 0 | 110944 | 2500 | 3 | 10.1 | 16.3 | 15.6 | 102 | 729 | .33 | 13.0 | 2.2 | 190 | 196 | -.65 | 2.613 | 17.330 | .289 | 123 79 |
| 188 | 903016 0 | 111023 | 2500 | 3 | 10.2 | 16.4 | 15.4 | 97 | 701 | .30 | 12.9 | 2.3 | 190 | 196 | -.65 | 2.591 | 17.470 | .620 | 123 79 |
| 189 | 903016 0 | 111027 | 2500 | 3 | 10.2 | 16.4 | 15.5 | 98 | 739 | .32 | 12.9 | 2.3 | 190 | 196 | -.65 | 2.591 | 17.300 | .959 | 123 79 |
| 190 | 903016 0 | 111033 | 2500 | 3 | 10.2 | 16.4 | 15.6 | 100 | 509 | .33 | 12.9 | 2.3 | 190 | 196 | -.65 | 2.593 | 17.360 | .201 | 123 79 |
| 191 | 903016 0 | 111037 | 2500 | 3 | 10.2 | 16.3 | 15.5 | 100 | 637 | .33 | 12.9 | 2.3 | 190 | 196 | -.65 | 2.602 | 17.070 | .972 | 123 79 |
| 192 | 903016 0 | 111041 | 2500 | 3 | 10.2 | 16.3 | 15.4 | 101 | 742 | .34 | 13.0 | 2.3 | 190 | 196 | -.65 | 2.597 | 17.360 | 1.602 | 123 79 |
| 193 | 900715 0 | 112047 | 1500 | 161 | .0 | 11.6 | 12.9 | 721 | 1631 | 4.89 | 11.2 | 1.0 | 192 | 193 | -1.13 | 4.590 | 18.070 | 2.240 | 123 79 |
| 194 | 900715 0 | 112054 | 1500 | 161 | .0 | 11.6 | 12.9 | 724 | 1631 | 4.12 | 11.1 | 1.0 | 191 | 193 | -1.13 | 4.546 | 18.320 | 2.203 | 123 79 |
| 195 | 900715 0 | 112058 | 1500 | 161 | .0 | 11.6 | 13.0 | 727 | 1632 | 4.11 | 11.1 | 1.0 | 191 | 193 | -1.14 | 4.500 | 18.430 | 2.291 | 123 79 |
| 196 | 900715 0 | 112102 | 1500 | 161 | .0 | 11.6 | 13.0 | 722 | 1620 | 4.12 | 11.1 | 1.0 | 190 | 193 | -1.14 | 4.555 | 18.320 | 2.261 | 123 79 |
| 197 | 900715 0 | 112106 | 1500 | 161 | .0 | 11.6 | 13.0 | 721 | 1630 | 4.11 | 11.1 | 1.0 | 190 | 193 | -1.14 | 4.573 | 18.330 | 2.157 | 123 79 |
| 198 | 900715 0 | 112110 | 1500 | 161 | .0 | 11.6 | 13.0 | 722 | 1615 | 4.12 | 11.1 | .0 | 189 | 193 | -1.13 | 4.592 | 18.230 | 2.215 | 123 79 |
| 199 | 900715 0 | 112123 | 1500 | 162 | .0 | 11.6 | 13.0 | 720 | 1623 | 4.11 | 11.1 | .9 | 189 | 193 | -1.14 | 4.563 | 17.370 | 2.177 | 123 79 |
| 200 | 900716 0 | 112129 | 1500 | 162 | .0 | 11.6 | 13.0 | 719 | 1610 | 4.09 | 11.1 | .9 | 189 | 193 | -1.14 | 4.576 | 17.400 | 2.184 | 123 79 |
| 201 | 900715 0 | 112134 | 1500 | 161 | .0 | 11.6 | 13.0 | 721 | 1620 | 4.07 | 11.2 | .9 | 192 | 193 | -1.14 | 4.901 | 17.590 | 2.100 | 123 79 |
| 202 | 900715 0 | 112204 | 1500 | 160 | .0 | 11.6 | 12.9 | 719 | 1670 | 4.00 | 11.2 | .9 | 190 | 193 | -1.13 | 4.529 | 17.940 | 2.005 | 123 79 |
| 203 | 900014 0 | 112909 | 1500 | 121 | 5.3 | 15.7 | 14.6 | 720 | 1072 | .73 | 13.0 | 1.9 | 188 | 193 | -.91 | 3.720 | 18.010 | 2.017 | 123 79 |
| 204 | 900014 0 | 112913 | 1500 | 121 | 5.3 | 15.7 | 14.6 | 721 | 1071 | .72 | 13.0 | 1.8 | 188 | 193 | -.93 | 3.725 | 17.930 | 2.579 | 123 79 |
| 205 | 900014 0 | 112918 | 1500 | 121 | 5.3 | 15.7 | 14.6 | 721 | 1070 | .76 | 13.0 | 1.8 | 189 | 193 | -.92 | 3.731 | 17.930 | 2.490 | 123 79 |
| 206 | 900014 0 | 112922 | 1500 | 121 | 5.6 | 15.7 | 14.6 | 720 | 1060 | .79 | 13.0 | 1.8 | 189 | 193 | -.93 | 3.739 | 17.930 | 2.177 | 123 79 |
| 207 | 900014 0 | 112926 | 1500 | 121 | 5.7 | 15.7 | 14.6 | 721 | 1057 | .79 | 13.0 | 1.9 | 190 | 192 | -.92 | 3.719 | 18.100 | 2.103 | 123 79 |
| 208 | 900014 0 | 112930 | 1500 | 121 | 5.1 | 15.7 | 14.6 | 720 | 1063 | .76 | 13.0 | 1.8 | 191 | 192 | -.93 | 3.730 | 17.530 | 2.005 | 123 79 |
| 209 | 900014 0 | 112955 | 1500 | 121 | 5.6 | 15.7 | 14.7 | 720 | 1069 | .71 | 13.0 | 1.9 | 191 | 192 | -.93 | 3.716 | 17.800 | 2.171 | 123 79 |
| 210 | 900014 0 | 112959 | 1500 | 121 | 5.3 | 15.7 | 14.6 | 721 | 1067 | .72 | 13.1 | 1.8 | 190 | 192 | -.94 | 3.750 | 17.710 | 2.505 | 123 79 |
| 211 | 900014 0 | 113003 | 1500 | 121 | 5.9 | 15.7 | 14.6 | 727 | 1066 | .76 | 13.0 | 1.9 | 189 | 192 | -.90 | 3.746 | 17.890 | 2.387 | 123 79 |
| 212 | 900014 0 | 113004 | 1500 | 121 | 5.3 | 15.7 | 14.6 | 724 | 1081 | .76 | 13.0 | 1.8 | 189 | 192 | -.93 | 3.724 | 17.560 | 2.241 | 123 79 |
| 213 | 900014 0 | 113007 | 1401 | 120 | 5.2 | 15.6 | 15.0 | 730 | 1132 | .77 | 12.9 | 1.1 | 187 | 190 | -.88 | 3.700 | 22.040 | 1.991 | 123 79 |

## TABLE B-1. CHRYSLER 225 CID TEST DATA (CONTD)

# TABLE B-1. CHRYSLER 225 CID TEST DATA (CONTD)

# TABLE B-1. CHRYSLER 225 CID TEST DATA (CONTD)

| REC NUM | NOMINAL CODE | TIME HHMMSS | RPM RPM | CTORQ LB-FT | EGR % | A/FCA |
|---|---|---|---|---|---|---|
| 324 | 904423 0 | 152050 | 3600 | 69 | 4.4 | 13.6 |
| 325 | 904423 0 | 152102 | 3600 | 68 | 4.4 | 13.6 |
| 326 | 904423 0 | 152106 | 3599 | 69 | 4.4 | 13.6 |
| 327 | 904423 0 | 152124 | 3600 | 69 | 4.4 | 13.5 |
| 328 | 904423 0 | 152128 | 3600 | 68 | 4.4 | 13.5 |
| 329 | 904423 0 | 152132 | 3600 | 69 | 4.3 | 13.3 |
| 330 | 904423 0 | 152136 | 3600 | 69 | 4.4 | 13.5 |
| 331 | 904423 0 | 152140 | 3600 | 68 | 4.4 | 13.5 |
| 332 | 904324 0 | 152723 | 3600 | 37 | 3.4 | 16.1 |
| 333 | 904324 0 | 152729 | 3600 | 38 | 3.4 | 16.1 |
| 334 | 904324 0 | 152741 | 3600 | 35 | 3.4 | 16.1 |
| 335 | 904324 0 | 152743 | 3600 | 35 | 3.4 | 16.1 |
| 336 | 904324 0 | 152749 | 3600 | 35 | 3.3 | 16.1 |
| 337 | 904324 0 | 152753 | 3599 | 36 | 3.3 | 16.1 |
| 338 | 904324 0 | 153010 | 3600 | 36 | 3.4 | 16.0 |
| 339 | 904324 0 | 153014 | 3600 | 36 | 3.4 | 16.0 |
| 340 | 904324 0 | 153018 | 3600 | 36 | 3.4 | 16.0 |
| 341 | 904324 0 | 153022 | 3600 | 37 | 3.4 | 16.1 |
| 342 | 904324 0 | 153026 | 3600 | 37 | 3.4 | 16.1 |
| 343 | 905023 0 | 153542 | 3000 | 120 | 3.9 | 14.2 |
| 344 | 905023 0 | 153546 | 3000 | 120 | 3.9 | 14.2 |
| 345 | 905023 0 | 153550 | 3000 | 120 | 3.9 | 14.2 |
| 346 | 905023 0 | 153554 | 3000 | 120 | 3.9 | 14.2 |
| 347 | 905023 0 | 153558 | 3000 | 120 | 3.9 | 14.2 |
| 348 | 905023 0 | 153611 | 3000 | 120 | 3.9 | 14.2 |
| 349 | 905023 0 | 153615 | 3000 | 121 | 3.9 | 14.2 |
| 350 | 905023 0 | 153619 | 3000 | 121 | 3.9 | 14.2 |
| 351 | 905023 0 | 153626 | 3000 | 121 | 3.9 | 14.2 |
| 352 | 905023 0 | 153630 | 3000 | 121 | 3.9 | 14.2 |
| 353 | 905113 0 | 154400 | 1500 | 123 | 4.0 | 13.6 |
| 354 | 905113 0 | 154406 | 1500 | 126 | 4.0 | 13.6 |
| 355 | 905113 0 | 154409 | 1500 | 126 | 4.0 | 13.6 |
| 356 | 905113 0 | 154429 | 1500 | 125 | 4.0 | 13.6 |
| 357 | 905113 0 | 154433 | 1500 | 125 | 4.1 | 13.5 |
| 358 | 905113 0 | 154437 | 1500 | 125 | 4.1 | 13.5 |
| 359 | 905113 0 | 154441 | 1500 | 125 | 4.2 | 13.5 |
| 360 | 905113 0 | 154453 | 1500 | 125 | 4.3 | 13.5 |
| 361 | 905113 0 | 154502 | 1500 | 124 | 4.2 | 13.5 |
| 362 | 905113 0 | 154507 | 1500 | 125 | 4.3 | 13.5 |
| 363 | 905113 0 | 154511 | 1500 | 125 | 4.3 | 13.5 |
| 364 | 905203 0 | 160344 | 870 | 118 | 3.7 | 16.5 |
| 365 | 905203 0 | 160349 | 870 | 119 | 3.7 | 16.5 |
| 366 | 905203 0 | 160353 | 869 | 119 | 3.7 | 16.5 |
| 367 | 905203 0 | 160357 | 870 | 120 | 3.7 | 16.4 |
| 368 | 905203 0 | 160406 | 869 | 119 | 3.7 | 16.4 |
| 369 | 905203 0 | 160413 | 868 | 119 | 3.7 | 16.4 |
| 370 | 905203 0 | 160417 | 868 | 118 | 3.7 | 16.4 |
| 371 | 905203 0 | 160422 | 870 | 119 | 3.7 | 16.4 |
| 372 | 905203 0 | 160427 | 870 | 118 | 3.7 | 16.4 |
| 373 | 905203 0 | 160431 | 870 | 119 | 3.6 | 16.4 |
| 374 | 905303 0 | 160436 | 873 | 58 | 11.5 | 16.7 |
| 375 | 905303 0 | 160441 | 874 | 58 | 11.9 | 16.7 |
| 376 | 905303 0 | 160449 | 874 | 58 | 11.9 | 16.8 |
| 377 | 905303 0 | 160459 | 874 | 57 | 11.9 | 16.8 |
| 378 | 905303 0 | 160455 | 874 | 56 | 11.6 | 16.7 |

| A/FTC LB/HR | CNOX PPM | HC PPM | CO % | CO2 % | O2 % | COOLT DEG-F | ENOIL DEG-F | AIRDP INH2O | AIRFLO LB/MIN | AHSHUM GR/LB | FLO S/S | DATE JDC YR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 16.1 | 676 | 58 | .10 | 13.0 | 1.0 | 190 | 207 | -1.90 | 7.264 | 29.290 | 3.902 | 123 79 |
| 16.1 | 677 | 44 | .10 | 13.0 | 1.0 | 190 | 207 | -1.91 | 7.207 | 29.070 | 3.936 | 123 79 |
| 16.1 | 677 | 56 | .17 | 13.0 | 1.0 | 190 | 207 | -1.91 | 7.282 | 29.190 | 3.967 | 123 79 |
| 16.0 | 673 | 54 | .19 | 13.0 | 1.0 | 190 | 207 | -1.91 | 7.293 | 28.330 | 3.997 | 123 79 |
| 16.1 | 673 | 45 | .18 | 13.0 | 1.0 | 190 | 207 | -1.89 | 7.253 | 28.670 | 4.002 | 123 79 |
| 16.1 | 674 | 40 | .17 | 13.1 | 1.0 | 190 | 207 | -1.87 | 7.176 | 28.500 | 3.910 | 123 79 |
| 16.1 | 675 | 37 | .16 | 13.1 | 1.0 | 190 | 207 | -1.88 | 7.204 | 28.420 | 3.967 | 123 79 |
| 16.1 | 673 | 32 | .18 | 13.0 | 1.0 | 190 | 207 | -1.89 | 7.245 | 28.320 | 3.935 | 123 79 |
| 16.7 | 620 | 20 | .05 | 12.7 | 1.6 | 190 | 206 | -1.47 | 5.616 | 29.390 | 2.841 | 123 79 |
| 16.7 | 610 | 19 | .06 | 12.7 | 1.6 | 190 | 206 | -1.47 | 5.614 | 28.990 | 2.861 | 123 79 |
| 16.7 | 646 | 19 | .05 | 12.7 | 1.6 | 190 | 206 | -1.46 | 5.586 | 28.720 | 2.873 | 123 79 |
| 16.7 | 633 | 19 | .05 | 12.7 | 1.6 | 190 | 206 | -1.45 | 5.582 | 28.670 | 3.147 | 123 79 |
| 16.6 | 650 | 19 | .05 | 12.7 | 1.6 | 190 | 206 | -1.45 | 5.504 | 28.640 | 2.945 | 123 79 |
| 16.6 | 634 | 19 | .07 | 12.7 | 1.6 | 190 | 206 | -1.46 | 5.602 | 28.300 | 3.142 | 123 79 |
| 16.6 | 636 | 19 | .05 | 12.7 | 1.5 | 190 | 206 | -1.43 | 5.555 | 28.710 | 2.515 | 123 79 |
| 16.6 | 641 | 19 | .05 | 12.6 | 1.5 | 190 | 206 | -1.43 | 5.551 | 28.020 | 2.874 | 123 79 |
| 16.7 | 639 | 19 | .05 | 12.7 | 1.5 | 190 | 206 | -1.46 | 5.582 | 28.830 | 2.859 | 123 79 |
| 16.7 | 635 | 19 | .05 | 12.7 | 1.5 | 190 | 206 | -1.45 | 5.560 | 28.010 | 2.800 | 123 79 |
| 16.6 | 632 | 19 | .06 | 12.7 | 1.6 | 190 | 206 | -1.44 | 5.547 | 28.860 | 2.890 | 123 79 |
| 14.1 | 686 | 974 | 2.59 | 11.0 | .9 | 190 | 202 | -2.00 | 7.660 | 29.340 | 4.670 | 123 79 |
| 14.1 | 689 | 1004 | 2.58 | 11.0 | .9 | 190 | 202 | -1.99 | 7.636 | 29.430 | 4.707 | 123 79 |
| 14.0 | 685 | 1002 | 2.64 | 11.0 | .9 | 190 | 201 | -1.99 | 7.647 | 29.320 | 4.732 | 123 79 |
| 14.0 | 684 | 989 | 2.65 | 11.0 | .9 | 190 | 202 | -1.99 | 7.656 | 29.140 | 4.710 | 123 79 |
| 14.0 | 684 | 990 | 2.64 | 11.0 | .9 | 190 | 202 | -2.00 | 7.682 | 28.020 | 4.749 | 123 79 |
| 14.0 | 682 | 982 | 2.65 | 11.0 | .9 | 190 | 202 | -2.00 | 7.661 | 29.050 | 4.735 | 123 79 |
| 14.0 | 683 | 986 | 2.67 | 11.0 | .9 | 190 | 202 | -2.00 | 7.601 | 29.410 | 4.725 | 123 79 |
| 14.0 | 687 | 1000 | 2.66 | 11.0 | .9 | 190 | 207 | -2.01 | 7.696 | 29.340 | 4.713 | 123 79 |
| 14.0 | 685 | 1007 | 2.66 | 11.0 | .9 | 189 | 202 | -2.01 | 7.607 | 29.320 | 4.726 | 123 79 |
| 14.0 | 686 | 1006 | 2.67 | 11.0 | .9 | 190 | 202 | -2.00 | 7.632 | 29.350 | 4.724 | 123 79 |
| 13.2 | 704 | 950 | .61 | 12.7 | 1.5 | 190 | 193 | -1.02 | 3.053 | 33.770 | 2.171 | 123 79 |
| 13.7 | 703 | 967 | .56 | 12.7 | 1.5 | 190 | 193 | -1.02 | 3.020 | 33.450 | 2.181 | 123 79 |
| 13.2 | 703 | 970 | .57 | 12.7 | 1.5 | 189 | 193 | -1.02 | 3.042 | 32.990 | 2.206 | 123 79 |
| 13.1 | 704 | 989 | .62 | 12.6 | 1.5 | 189 | 192 | -1.01 | 3.025 | 32.500 | 2.160 | 123 79 |
| 13.1 | 704 | 981 | .61 | 12.6 | 1.4 | 190 | 192 | -1.01 | 3.025 | 32.330 | 2.175 | 123 79 |
| 15.1 | 703 | 974 | .66 | 12.7 | 1.4 | 190 | 192 | -1.02 | 3.036 | 32.460 | 2.219 | 123 79 |
| 15.0 | 701 | 996 | .60 | 12.8 | 1.4 | 190 | 193 | -1.02 | 3.032 | 32.220 | 2.219 | 123 79 |
| 15.1 | 703 | 1009 | .61 | 12.7 | 1.4 | 191 | 192 | -1.02 | 3.062 | 34.260 | 2.171 | 123 79 |
| 15.1 | 706 | 997 | .64 | 12.8 | 1.4 | 191 | 192 | -1.03 | 3.061 | 34.720 | 2.178 | 123 79 |
| 15.1 | 706 | 999 | .66 | 12.7 | 1.4 | 190 | 192 | -1.02 | 3.036 | 34.620 | 2.190 | 123 79 |
| 15.1 | 706 | 1000 | .64 | 12.7 | 1.4 | 190 | 193 | -1.02 | 3.043 | 34.320 | 2.226 | 123 79 |
| 15.5 | 651 | 1037 | .10 | 12.9 | 2.3 | 190 | 186 | -.57 | 2.151 | 34.960 | 1.182 | 124 79 |
| 15.5 | 650 | 1037 | .11 | 12.8 | 2.3 | 190 | 187 | -.57 | 2.189 | 35.420 | 1.220 | 124 79 |
| 15.6 | 652 | 1042 | .11 | 12.8 | 2.3 | 190 | 186 | -.57 | 2.191 | 35.990 | 1.223 | 124 79 |
| 15.5 | 654 | 1044 | .13 | 12.8 | 2.3 | 190 | 186 | -.57 | 2.193 | 35.820 | 1.216 | 124 79 |
| 15.6 | 653 | 1026 | .17 | 12.8 | 2.3 | 190 | 186 | -.57 | 2.193 | 35.670 | 1.196 | 124 79 |
| 15.5 | 656 | 1017 | .12 | 12.9 | 2.3 | 190 | 187 | -.57 | 2.179 | 35.120 | 1.207 | 124 79 |
| 15.5 | 649 | 1032 | .13 | 12.9 | 2.3 | 190 | 186 | -.57 | 2.184 | 34.810 | 1.181 | 124 79 |
| 15.5 | 651 | 1025 | .15 | 12.9 | 2.2 | 190 | 187 | -.57 | 2.185 | 35.250 | 1.212 | 124 79 |
| 15.6 | 652 | 1051 | .10 | 12.8 | 2.2 | 190 | 186 | -.57 | 2.191 | 35.540 | 1.241 | 124 79 |
| 15.5 | 651 | 1057 | .11 | 12.9 | 2.2 | 190 | 187 | -.5 | 2.187 | 35.490 | 1.230 | 124 79 |
| 14.2 | 190 | 1571 | .10 | 12.3 | 3.0 | 190 | 186 | -.43 | 1.627 | 34.030 | .882 | 124 79 |
| 14.2 | 184 | 1497 | .13 | 12.3 | 3.0 | 190 | 186 | -.42 | 1.674 | 34.190 | .905 | 124 79 |
| 14.6 | 173 | 1127 | .15 | 12.3 | 3.0 | 190 | 186 | -.42 | 1.625 | 34.660 | .855 | 124 79 |
| 14.6 | 167 | 1104 | .16 | 12.3 | 3.0 | 190 | 186 | -.42 | 1.619 | 34.900 | .896 | 124 79 |
| 14.6 | 161 | 1150 | .17 | 12.4 | 3.0 | 191 | 186 | -.42 | 1.618 | 35.130 | .890 | 124 79 |

## TABLE B-1. CHRYSLER 225 CID TEST DATA (CONTD)

[illegible]

## TABLE B-1. CHRYSLER 225 CID TEST DATA (CONTD)

[illegible]

## TABLE B-1. CHRYSLER 225 CID TEST DATA (CONTD)

| [illegible] RPM | NOMINAL CODE | TIME HHMMSS | RPM RPM | [illegible] LB-FT | EGR % | A/F[illegible] |
|---|---|---|---|---|---|---|
| 489 | 906304 0 | 101300 | 740 | 0 | 1.7 | 19.0 |
| 490 | 906304 0 | 101726 | 740 | 1 | 4.2 | 19.7 |
| 491 | 906304 0 | 101400 | 749 | 1 | 2.5 | 19.7 |
| 492 | 906205 0 | [illegible] | 750 | 1 | 2.2 | 17.8 |
| 493 | 906304 0 | 101400 | 749 | 0 | 2.5 | 19.9 |
| 494 | 906304 0 | 101112 | 747 | 0 | 2.5 | 19.8 |
| 495 | 906304 0 | 101416 | 740 | 1 | 2.5 | 19.8 |

| A/FUEL LB/HR | [illegible] PPM | HC PPM | CO % | CO2 % | O2 % | COOLT DEG-F | [illegible] DEG-F | [illegible] INH2O | AIRFLO LB/MIN | ABSHUM GR/LB | [illegible] | DATE [illegible] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1.0 | 23 | 13990 | 31 | 9.2 | 7.0 | 180 | 182 | -.16 | 665 | 16 340 | 354 | [illegible] 79 |
| 1.0 | 25 | 14070 | 28 | 9.1 | 7.7 | 180 | 183 | -.16 | 662 | 16 690 | 363 | [illegible] 79 |
| 1.0 | 24 | 14920 | 30 | 9.0 | 7.7 | 180 | 183 | -.16 | 660 | 16 690 | 330 | [illegible] 79 |
| 1.0 | 24 | 14270 | 28 | 9.1 | 7.0 | 180 | 183 | -.16 | 659 | 16 770 | 337 | [illegible] 79 |
| 1.0 | 25 | 13030 | 29 | 9.1 | 7.0 | 187 | 182 | -.16 | 661 | 16 750 | 340 | [illegible] 79 |
| 1.0 | 25 | 14030 | 29 | 9.2 | 7.7 | 180 | 182 | -.16 | 660 | 16 790 | 424 | [illegible] 79 |
| 1.0 | 23 | 13070 | 29 | 9.2 | 7.7 | 187 | 183 | -.16 | 655 | 16 700 | 430 | [illegible] 79 |

# TABLE B-1. CHRYSLER 225 CID TEST DATA (CONTD)

## NEGATIVE TORQUES

| RPM | ETORQUE LB-FT | A/F EX | NOCONC PPM | HCCONC PPM | COCONC % | CO2CONC % | O2CONC % | COOL ETEMP DEG F | EXOIL TEMP DEG F | MASSAFLOW LBS/MIN | ABSHUM GR/LB |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1500 | -25.38 | 17.47 | 21.39 | .1373E+05 | .4031 | 6.198 | 4.441 | 186.7 | 194.7 | 1633 | 44.24 |
| 1500 | -10.32 | 14.22 | 21.56 | .4116E+05 | .3018 | 8.779 | 8.613 | 186.7 | 196.8 | 3003 | 44.50 |
| 1500 | -4.990 | 17.13 | 53.29 | 8000 | .3354 | 11.22 | 4.546 | 187.3 | 197.6 | .3296E-01 | 44.37 |
| 1000.0 | -14.39 | 16.84 | 30.11 | .1193E+05 | 1.960 | 9.409 | 3.761 | 187.7 | 191.6 | .1107 | 45.26 |
| 1000.0 | -9.020 | 16.77 | 76.98 | 9689 | 2.198 | 11.84 | 7.826 | 187.7 | 188.6 | .1430 | 45.03 |
| 999.7 | -3.309 | 20.11 | 40.90 | 2554 | .3722 | 11.16 | 9.610 | 186.3 | 186.7 | .2234 | 45.10 |
| 2000 | -32.24 | 17.96 | 13.86 | .1307E+05 | .5570 | 5.309 | 4.809 | 187.1 | 212.3 | .7381 | 49.11 |
| 2000 | -6.904 | 17.10 | 26.71 | 6041 | .3136 | 10.55 | 3.862 | 186.9 | 211.3 | 2.197 | 56.67 |
| 2500 | -28.79 | 18.87 | 14.60 | .1269E+05 | .5701 | 8.749 | 7.452 | 187.0 | 223.6 | 1.620 | 48.85 |
| 2500 | -10.44 | 17.87 | 70.00 | 4701 | .3030 | 11.00 | 8.530 | 187.4 | 226.9 | 2.613 | 49.76 |
| 3000 | -40.01 | 19.19 | 11.85 | .1208E+05 | .2133 | 9.059 | 6.374 | 188.0 | 235.0 | .5132 | 31.70 |
| 3000 | -20.75 | 18.76 | 15.89 | .1161E+05 | .3196 | 9.260 | 5.973 | 188.0 | 234.2 | 1.760 | 30.62 |
| 3000 | -8.737 | 13.70 | 65.83 | 399.0 | .1592 | 12.41 | 1.210 | 181.0 | 230.7 | 2.024 | 32.16 |
| 3598 | -.1599 | 13.39 | 137.1 | 13.92 | .9587E-01 | 13.84 | .7854 | 182.0 | 267.8 | 1.139 | 37.65 |
| 3600 | -47.59 | 16.50 | 14.00 | .1226E+05 | .2570 | 7.213 | 1.013 | 182.1 | 237.1 | .4427 | 30.78 |
| 3598 | -35.70 | 17.73 | 17.17 | .3337E+05 | .3372 | 9.551 | 11.33 | 182.0 | 238.7 | 2.664 | 37.91 |
| 3599 | -11.60 | 14.06 | 84.49 | 3117 | .8761 | 12.95 | .1099 | 183.0 | 260.9 | 3.200 | 40.43 |
| 520.0 | -10.63 | 16.74 | 22.62 | .1001E+05 | 1.704 | 9.222 | 3.196 | 183.0 | 181.3 | .4820 | 64.59 |
| 475.7 | -1.916 | 10.10 | 46.96 | 9306 | .3591 | 9.752 | 3.393 | 184.2 | 179.9 | .5596 | 62.44 |
| 756.0 | -7.412 | 18.26 | 13.76 | .1057E+05 | .3702 | 9.312 | 3.742 | 184.0 | 170.0 | .4889 | 63.19 |
| 770.0 | -1.407 | 19.80 | 21.43 | 9716 | .2916 | 9.190 | 4.116 | 182.5 | 177.7 | .3101 | 62.30 |

# TABLE B-2. CHRYSLER 225 CID REDUCED TEST DATA.

| RPM | CORRECTED TORQUE (LB-FT) | EGR (PERCENT) | AIR-FUEL RATIO | FUEL FLOW (LB/HR) | NO$_x$ (GM/HR) | HC (GM/HR) | CO (GM/HR) |
|---|---|---|---|---|---|---|---|
| [illegible] | [illegible] | 6.2383 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| [illegible] | [illegible] | 7.1333 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| [illegible] | [illegible] | 7.5603 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
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| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
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| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| [illegible] | [illegible] | 2.8720 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |