# ATTACHMENT C

## Engineering Operations Division
## Data Presentation Methodology

Graph Preparation:

Attachment A emission status graphs are based on an analysis of last test pairs and all confirmation strata. All emissions data has had tests removed which exceed screening limits. These limits are presented below. Fuel economy status graphs are prepared in a similar manner except that the "FE up by 1 or more" stratum has also been deleted.

Attachment B is developed using the same methodology as is used for Attachment A. It shows the monthly means and three month's running averages for individual manufacturer's fuel economy and quickcheck coastdown times. The running averages for individual months are grand averages of results from the month of interest and the two preceding months.

These graphs may change in subsequent months, as the test disposition of any individual test may change. These changes may result in tests being either included or excluded from the graphs.

Summary Statistics Preparation:

The data in the Appendix is based on an analysis of the last test pairs of all strata, and has had pairs removed which exceed the following screening limits:

### Paired Data Rejection Criteria

| | HC g/mi | CO g/mi | $CO_2$ g/mi | NOx g/mi | FE mpg | Evap g |
|---|---|---|---|---|---|---|
| **FTP** | | | | | | |
| Upper | 0.75 | 6.0 | 65.0 | 0.75 | 3.2 | |
| Lower | -0.75 | -6.0 | -65.0 | -0.75 | -3.2 | |
| **FTP (% Difference)** | | | | | | |
| Upper | 135.0 | 160.0 | 15.0 | 100.0 | 15.0 | * |
| Lower | -99.0 | -99.0 | -15.0 | -99.0 | -15.0 | * |

HFET

| | HC g/mi | CO g/mi | $CO_2$ g/mi | NOx g/mi | FE mpg | CDT sec |
|---|---|---|---|---|---|---|
| Upper | 0.2 | 6.0 | 45.0 | 1.0 | 4.5 | |
| Lower | -0.2 | -6.0 | -45.0 | -1.0 | -4.5 | |

HFET (% Difference)

| | | | | | | |
|---|---|---|---|---|---|---|
| Upper | | | | | 15.0 | 15% |
| Lower | | | | | -15.0 | -15% |

* Values to be set in revised paired data program currently under development.

0053g

**Appendix 1**

PROCESSED: 07:06:09 MAY 8, 1991

CCID: SN8Z

PROJECT: 7030

NAME: RKG

```
*************************
*                       *  TTTTT  EEEEE  SSSSS  TTTTT  SSSSS  U   U  M   M  SSSSS
*  PAIRED DATA ANALYSIS *    T    E      S        T    S      U   U  MM MM  S
*                       *    T    EEE    SSSSS    T    SSSSS  U   U  M M M  SSSSS
*   SUMMARY STATISTICS  *    T    E          S    T        S  U   U  M   M      S
*                       *    T    EEEEE  SSSSS    T    SSSSS   UUU   M   M  SSSSS
*************************
```

PERIOD OF ANALYSIS: 4- 1-91 TO 4-30-91
PAIR TYPE: EPA:MFR
MODEL YEAR(S): ALL
FUEL TYPES: NO LEAD (IND HO), NO. 2 DIESEL
VEHICLE ADJUSTMENT: ALL VEHICLES
TEST(S) EXCLUDED: TEST PAIRS THAT ARE NOT THE LATEST FOR EACH VEHICLE

TEST TYPE(S): EMISSION DATA FUEL ECONOMY
ANALYZER(S): ALL
DYNAMOMETER(S): ALL
EVAP CLASS: EVAP AND NON EVAP
HIGH ALTITUDE: NO HIGH ALTITUDE VEHICLES INCLUDED

COMMENTS:

| | FTP GAS | FTP DIESEL | HWFE GAS | HWFE DIESEL |
|---|---|---|---|---|
| | ****** | ****** | ****** | ****** |
| A. NUMBER OF VALID EPA PAIRS INCLUDED IN THE ANALYSIS | 42 | 0 | 46 | 0 |
| B. NUMBER OF VALID EPA PAIRS WITH EXTREME DATA EXCLUDED FROM THE ANALYSIS | 2 | 0 | 0 | 0 |
| C. NUMBER OF VALID EPA PAIRS NOT MEETING THE SELECTION CRITERIA | 8 | 0 | 8 | 0 |
| D. NUMBER OF VALID EPA TESTS WITH NO PAIRS OR NO PAIRS OF THIS PAIR TYPE | 4 | 1 | 6 | 0 |
| E. NUMBER OF VOID EPA TESTS | 0 | 1 | 3 | 0 |
| TOTAL NUMBER OF EPA TESTS IN THIS PERIOD | 56 | 2 | 63 | 0 |
| PAIRS MADE = (A+B+C) | 52 | 0 | 54 | 0 |
| POSSIBLE PAIRS = (A+B+C+D) | 56 | 1 | 60 | 0 |
| PERCENT PAIRED: ((A+B+C)/PPAIRS)*100% | 92.9 | 0.0 | 90.0 | 0.0 |
| PERCENT NOT PAIRED: (D/PPAIRS)*100% | 7.1 | 100.0 | 10.0 | 0.0 |
| | 100.0 | 100.0 | 100.0 | 0.0 |

# Appendix 2

PROCESSED: 07:06:09 MAY 8, 1991

PERIOD OF ANALYSIS: 4- 1-91 TO 4-30-91

PAIR TYPE: EPA:MFR

```
*********************************
*                               *
*     PAIRED DATA ANALYSIS      *
*                               *
*     SUMMARY STATISTICS        *
*                               *
*********************************
```

```
FFFFF  TTTTT  PPPP   DDDD   EEEEE  L
F        T    P   P  D   D  E      L
FFF      T    PPPP   D   D  EEE    L
F        T    P      D   D  E      L
F        T    P      DDDD   EEEEE  LLLLL
```

COMMENTS:

SIGNED DIFFERENCES: (MFR - EPA) - GASOLINE ONLY -

| | HC | | | CO | | | CO2 | | | NOX | | | MPG | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | NUM | AVG | STDEV | NUM | AVG | STDEV | NUM | AVG | STDEV | NUM | AVG | STDEV | NUM | AVG | STDEV |
| 20 CHRYS | 3 | 0.005 | 0.038 | 3 | -0.47 | 1.28 | 3 | 2.8 | 6.8 | 3 | -0.113 | 0.061 | 3 | 0.19 | 0.50 |
| 30 FORD | 11 | -0.012 | 0.027 | 11 | -0.12 | 0.59 | 11 | -4.1 | 6.1 | 11 | -0.041 | 0.073 | 11 | 0.29 | 0.21 |
| 40 GM | 13 | -0.005 | 0.028 | 13 | -0.13 | 0.28 | 13 | 4.7 | 5.4 | 13 | -0.023 | 0.019 | 13 | -0.02 | 0.36 |
| 120 BMW | 1 | -0.011 | 0.000 | 1 | -0.02 | 0.00 | 1 | -3.6 | 0.0 | 1 | 0.000 | 0.000 | 1 | 0.08 | 0.00 |
| 200 MBZ | 3 | -0.015 | 0.003 | 3 | -0.21 | 0.13 | 3 | 6.1 | 15.4 | 3 | 0.011 | 0.016 | 3 | -0.33 | 0.65 |
| 260 HONDA | 3 | -0.007 | 0.014 | 3 | -0.29 | 0.43 | 3 | -8.3 | 6.3 | 3 | -0.028 | 0.057 | 3 | 0.43 | 0.34 |
| 305 JCI | 1 | -0.021 | 0.000 | 1 | 0.15 | 0.00 | 1 | 16.9 | 0.0 | 1 | -0.006 | 0.000 | 1 | -0.34 | 0.00 |
| 380 NISSN | 2 | 0.055 | 0.037 | 2 | -0.10 | 0.31 | 2 | 7.0 | 12.9 | 2 | 0.074 | 0.023 | 2 | -0.33 | 1.04 |
| 440 R-R | 1 | -0.009 | 0.000 | 1 | 0.23 | 0.00 | 1 | -10.1 | 0.0 | 1 | 0.065 | 0.000 | 1 | 0.24 | 0.00 |
| 570 TOYOT | 1 | 0.017 | 0.000 | 1 | 0.24 | 0.00 | 1 | 3.6 | 0.0 | 1 | -0.173 | 0.000 | 1 | -0.23 | 0.00 |
| 590 V W | 2 | 0.026 | 0.006 | 2 | 0.29 | 0.02 | 2 | -16.6 | 10.7 | 2 | 0.037 | 0.025 | 2 | 1.02 | 0.69 |
| 640 AUDI | 1 | -0.056 | 0.000 | 1 | -0.11 | 0.00 | 1 | -7.3 | 0.0 | 1 | 0.018 | 0.000 | 1 | 0.34 | 0.00 |
| ALL | 42 | -0.004 | 0.029 | 42 | -0.12 | 0.48 | 42 | -0.1 | 9.3 | 42 | -0.024 | 0.063 | 42 | 0.13 | 0.47 |

PROCESSED: 07:06:09 MAY 8, 1991

PERIOD OF ANALYSIS: 4- 1-91 TO 4-30-91

PAIR TYPE: EPA:MFR

```
*********************************
*                               *
*     PAIRED DATA ANALYSIS      *
*                               *
*     SUMMARY STATISTICS        *
*                               *
*********************************
```

```
FFFFF  TTTTT  PPPP   PPPP   CCCC  TTTTT
F        T    P   P  P   P  C        T
FFF      T    PPPP   PPPP   C        T
F        T    P      P      C        T
F        T    P      P       CCCC    T
```

COMMENTS:

PERCENT DIFFERENCES: ((MFR - EPA)/EPA) X 100% - GASOLINE ONLY -

| | HC | | | CO | | | CO2 | | | NOX | | | MPG | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | NUM | AVG | STDEV | NUM | AVG | STDEV | NUM | AVG | STDEV | NUM | AVG | STDEV | NUM | AVG | STDEV |
| 20 CHRYS | 3 | 3.2 | 17.7 | 3 | -9.2 | 31.5 | 3 | 0.36 | 1.55 | 3 | -27.7 | 13.6 | 3 | 0.68 | 2.22 |
| 30 FORD | 11 | -5.8 | 12.9 | 11 | 5.5 | 42.3 | 11 | -0.81 | 1.15 | 11 | -10.5 | 22.6 | 11 | 1.57 | 1.08 |
| 40 GM | 13 | -4.0 | 16.8 | 13 | -8.8 | 15.8 | 13 | 1.21 | 1.39 | 13 | -11.9 | 10.3 | 13 | -0.07 | 1.42 |
| 120 BMW | 1 | -5.4 | 0.0 | 1 | -1.2 | 0.0 | 1 | -0.54 | 0.00 | 1 | 0.0 | 0.0 | 1 | 0.61 | 0.00 |
| 200 MBZ | 3 | -16.3 | 1.9 | 3 | -20.3 | 9.3 | 3 | 1.43 | 3.39 | 3 | 16.0 | 23.5 | 3 | -1.67 | 3.31 |
| 260 HONDA | 3 | -3.6 | 6.7 | 3 | -16.6 | 22.0 | 3 | -1.97 | 1.48 | 3 | -2.1 | 28.1 | 3 | 2.06 | 1.65 |
| 305 JCI | 1 | -17.4 | 0.0 | 1 | 16.1 | 0.0 | 1 | 2.75 | 0.00 | 1 | -6.1 | 0.0 | 1 | -2.37 | 0.00 |
| 380 NISSN | 2 | 25.6 | 18.4 | 2 | -5.2 | 18.3 | 2 | 2.12 | 3.86 | 2 | 32.5 | 6.9 | 2 | -1.21 | 3.98 |
| 440 R-R | 1 | -6.9 | 0.0 | 1 | 31.1 | 0.0 | 1 | -1.30 | 0.00 | 1 | 15.1 | 0.0 | 1 | 2.12 | 0.00 |
| 570 TOYOT | 1 | 9.7 | 0.0 | 1 | 17.6 | 0.0 | 1 | 0.80 | 0.00 | 1 | -41.9 | 0.0 | 1 | -1.18 | 0.00 |
| 590 V W | 2 | 16.2 | 5.2 | 2 | 29.4 | 8.6 | 2 | -4.29 | 2.82 | 2 | 43.5 | 30.0 | 2 | 4.53 | 2.96 |
| 640 AUDI | 1 | -20.4 | 0.0 | 1 | -6.3 | 0.0 | 1 | -1.54 | 0.00 | 1 | 19.6 | 0.0 | 1 | 1.84 | 0.00 |
| ALL | 42 | -2.9 | 15.6 | 42 | -2.0 | 27.6 | 42 | 0.05 | 2.18 | 42 | -4.1 | 24.3 | 42 | 0.65 | 2.15 |

PROCESSED: 07:06:13 MAY 8, 1991

PERIOD OF ANALYSIS: 4- 1-91 TO 4-30-91

PAIR TYPE: EPA:MFR

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*********************************
*                               *   H   H  W   W  FFFFF  EEEEE  DDDD   EEEEE  L
*     PAIRED DATA ANALYSIS      *   H   H  W   W  F      E      D   D  E      L
*                               *   HHHHH  W W W  FFF    EEE    D   D  EEE    L
*     SUMMARY STATISTICS        *   H   H  WW WW  F      E      D   D  E      L
*                               *   H   H  W   W  F      EEEEE  DDDD   EEEEE  LLLLL
*********************************
```

COMMENTS:

SIGNED DIFFERENCES: (MFR - EPA) - GASOLINE ONLY -

| | HC | | | CO | | | CO2 | | | NOX | | | MPG | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | NUM | AVG | STDEV | NUM | AVG | STDEV | NUM | AVG | STDEV | NUM | AVG | STDEV | NUM | AVG | STDEV |
| 20 CHRYS | 2 | 0.011 | 0.041 | 2 | 0.03 | 0.23 | 2 | 4.3 | 0.5 | 2 | -0.032 | 0.005 | 2 | -0.13 | 0.16 |
| 30 FORD | 11 | 0.006 | 0.034 | 11 | 0.14 | 0.65 | 11 | 0.7 | 5.7 | 11 | -0.157 | 0.219 | 11 | 0.12 | 0.45 |
| 40 GM | 15 | 0.018 | 0.038 | 15 | 0.07 | 0.25 | 15 | 2.6 | 6.0 | 15 | -0.006 | 0.051 | 15 | -0.22 | 1.07 |
| 120 BMW | 1 | -0.044 | 0.000 | 1 | -0.17 | 0.00 | 1 | 3.9 | 0.0 | 1 | 0.002 | 0.000 | 1 | -0.38 | 0.00 |
| 200 MBZ | 3 | -0.014 | 0.005 | 3 | -0.03 | 0.03 | 3 | -3.0 | 6.4 | 3 | 0.008 | 0.021 | 3 | 0.26 | 0.56 |
| 260 HONDA | 1 | -0.003 | 0.000 | 1 | -0.10 | 0.00 | 1 | -5.4 | 0.0 | 1 | 0.004 | 0.000 | 1 | 0.52 | 0.00 |
| 305 JCI | 1 | 0.010 | 0.000 | 1 | 0.00 | 0.00 | 1 | 0.9 | 0.0 | 1 | -0.076 | 0.000 | 1 | 0.05 | 0.00 |
| 347 LIPHT | 1 | 0.003 | 0.000 | 1 | -0.12 | 0.00 | 1 | 49.6 | 0.0 | 1 | 0.045 | 0.000 | 1 | -2.43 | 0.00 |
| 380 NISSN | 2 | 0.041 | 0.009 | 2 | 0.10 | 0.04 | 2 | 4.8 | 10.0 | 2 | -0.171 | 0.127 | 2 | -0.60 | 1.66 |
| 440 R-R | 1 | -0.005 | 0.000 | 1 | -0.01 | 0.00 | 1 | 19.3 | 0.0 | 1 | -0.010 | 0.000 | 1 | -0.56 | 0.00 |
| 490 MITSH | 1 | 0.017 | 0.000 | 1 | 0.03 | 0.00 | 1 | 3.9 | 0.0 | 1 | 0.301 | 0.000 | 1 | -0.16 | 0.00 |
| 570 TOYOT | 1 | -0.005 | 0.000 | 1 | -0.04 | 0.00 | 1 | 0.1 | 0.0 | 1 | -0.080 | 0.000 | 1 | -0.05 | 0.00 |
| 590 V W | 5 | 0.018 | 0.044 | 5 | 0.15 | 0.26 | 5 | -0.4 | 3.1 | 5 | 0.012 | 0.029 | 5 | 0.20 | 0.44 |
| 640 AUDI | 1 | -0.018 | 0.000 | 1 | -0.14 | 0.00 | 1 | 1.2 | 0.0 | 1 | -0.004 | 0.000 | 1 | 0.09 | 0.00 |
| ALL | 46 | 0.010 | 0.034 | 46 | 0.06 | 0.36 | 46 | 2.8 | 9.2 | 46 | -0.042 | 0.141 | 46 | -0.10 | 0.82 |

PROCESSED: 07:06:13 MAY 8, 1991

PERIOD OF ANALYSIS: 4- 1-91 TO 4-30-91

PAIR TYPE: EPA:MFR

```
*********************************
*                               *   H   H  W   W  FFFFF  EEEEE  PPPP    CCCC  TTTTT
*     PAIRED DATA ANALYSIS      *   H   H  W   W  F      E      P   P  C        T
*                               *   HHHHH  W W W  FFF    EEE    PPPP   C        T
*     SUMMARY STATISTICS        *   H   H  WW WW  F      E      P      C        T
*                               *   H   H  W   W  F      EEEEE  P       CCCC    T
*********************************
```

COMMENTS:

PERCENT DIFFERENCES: ((MFR - EPA)/EPA) X 100% - GASOLINE ONLY -

| | HC | | | CO | | | CO2 | | | NOX | | | MPG | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | NUM | AVG | STDEV | NUM | AVG | STDEV | NUM | AVG | STDEV | NUM | AVG | STDEV | NUM | AVG | STDEV |
| 20 CHRYS | 2 | 57.0 | 108.0 | 2 | 161.4 | 243.1 | 2 | 1.17 | 0.44 | 2 | -18.0 | 12.2 | 2 | -0.39 | 0.46 |
| 30 FORD | 11 | 23.1 | 114.6 | 11 | 33.1 | 229.3 | 11 | 0.17 | 1.63 | 11 | -27.2 | 36.6 | 11 | 0.38 | 1.72 |
| 40 GM | 15 | 37.8 | 71.7 | 15 | 101.4 | 241.0 | 15 | 1.38 | 2.69 | 15 | -40.0 | 53.4 | 15 | -0.33 | 2.63 |
| 120 BMW | 1 | -77.2 | 0.0 | 1 | -38.6 | 0.0 | 1 | 1.28 | 0.00 | 1 | 11.1 | 0.0 | 1 | -1.32 | 0.00 |
| 200 MBZ | 3 | -33.8 | 18.8 | 3 | -19.8 | 26.6 | 3 | -0.85 | 2.00 | 3 | 96.3 | 160.6 | 3 | 1.02 | 2.04 |
| 260 HONDA | 1 | -2.6 | 0.0 | 1 | -24.4 | 0.0 | 1 | -1.95 | 0.00 | 1 | 25.0 | 0.0 | 1 | 1.64 | 0.00 |
| 305 JCI | 1 | 200.0 | 0.0 | 1 | 0.0 | 0.0 | 1 | 0.23 | 0.00 | 1 | -93.8 | 0.0 | 1 | 0.23 | 0.00 |
| 347 LIPHT | 1 | 16.7 | 0.0 | 1 | -54.5 | 0.0 | 1 | 12.58 | 0.00 | 1 | 62.5 | 0.0 | 1 | -10.85 | 0.00 |
| 380 NISSN | 2 | 312.7 | 312.0 | 2 | 181.7 | 73.1 | 2 | 2.20 | 4.47 | 2 | -74.2 | 13.7 | 2 | -1.50 | 4.21 |
| 440 R-R | 1 | -22.7 | 0.0 | 1 | -4.8 | 0.0 | 1 | 3.94 | 0.00 | 1 | -15.4 | 0.0 | 1 | -3.11 | 0.00 |
| 490 MITSH | 1 | 54.8 | 0.0 | 1 | 300.0 | 0.0 | 1 | 1.53 | 0.00 | 1 | 151.3 | 0.0 | 1 | -0.46 | 0.00 |
| 570 TOYOT | 1 | -21.7 | 0.0 | 1 | -100.0 | 0.0 | 1 | 0.03 | 0.00 | 1 | -21.1 | 0.0 | 1 | -0.18 | 0.00 |
| 590 V W | 5 | 34.4 | 81.7 | 5 | 60.8 | 105.0 | 5 | -0.17 | 1.31 | 5 | 91.7 | 173.0 | 5 | 0.56 | 1.18 |
| 640 AUDI | 1 | -12.5 | 0.0 | 1 | -21.5 | 0.0 | 1 | 0.43 | 0.00 | 1 | -28.6 | 0.0 | 1 | 0.29 | 0.00 |
| ALL | 46 | 38.4 | 111.7 | 46 | 62.4 | 193.2 | 46 | 0.95 | 2.78 | 46 | -5.3 | 91.3 | 46 | -0.27 | 2.58 |

PROCESSED: 07:06:11 MAY 8, 1991

PERIOD OF ANALYSIS: 4- 1-91 TO 4-30-91

PAIR TYPE: EPA:MFR

```
*****************************
*                           *   EEEEE  V   V   AAA   PPPP   DDDD    AAA   TTTTT   AAA
*   PAIRED DATA ANALYSIS    *   E      V   V  A   A  P   P  D   D  A   A    T    A   A
*                           *   EEE    V   V  AAAAA  PPPP   D   D  AAAAA    T    AAAAA
*   SUMMARY STATISTICS      *   E       V V   A   A  P      D   D  A   A    T    A   A
*                           *   EEEEE    V    A   A  P      DDDD   A   A    T    A   A
*****************************
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COMMENTS:

DATA AND DIFFERENCES:
**********

| | EPA GM/TEST | | | (M-E) DIURNAL | | | (M-E) H.SOAK | | | (M-E) TOTAL | | | (M-E)/E % DIFF | | | EPA SOAK | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | NUM | AVG | STDEV | NUM | AVG | STDEV | NUM | AVG | STDEV | NUM | AVG | STDEV | NUM | AVG | STDEV | NUM | AVG | STDEV |
| 20 CHRYS | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.0 | 0.0 | 0 | 0.0 | 0.0 |
| 30 FORD | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.0 | 0.0 | 0 | 0.0 | 0.0 |
| 40 GM | 5 | 0.45 | 0.13 | 5 | 0.00 | 0.09 | 5 | 0.06 | 0.04 | 5 | 0.06 | 0.11 | 5 | 22.9 | 46.2 | 5 | 22.2 | 2.6 |
| 120 BMW | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.0 | 0.0 | 0 | 0.0 | 0.0 |
| 200 MBZ | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.0 | 0.0 | 0 | 0.0 | 0.0 |
| 260 HONDA | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.0 | 0.0 | 0 | 0.0 | 0.0 |
| 305 JCI | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.0 | 0.0 | 0 | 0.0 | 0.0 |
| 380 NISSN | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.0 | 0.0 | 0 | 0.0 | 0.0 |
| 440 R-R | 1 | 0.77 | 0.00 | 1 | -0.01 | 0.00 | 1 | 0.02 | 0.00 | 1 | 0.01 | 0.00 | 1 | 1.3 | 0.0 | 1 | 17.0 | 0.0 |
| 570 TOYOT | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.0 | 0.0 | 0 | 0.0 | 0.0 |
| 590 V W | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.0 | 0.0 | 0 | 0.0 | 0.0 |
| 640 AUDI | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.0 | 0.0 | 0 | 0.0 | 0.0 |
| ALL | 6 | 0.50 | 0.18 | 6 | 0.00 | 0.09 | 6 | 0.05 | 0.04 | 6 | 0.05 | 0.10 | 6 | 19.3 | 42.2 | 6 | 21.3 | 3.1 |
| BY SHED: | (EPA TESTS) | | | | | | | | | | | | | | | | | |
| ******* | | | | | | | | | | | | | | | | | | |
| S001 | 4 | 0.54 | 0.16 | 4 | -0.03 | 0.02 | 4 | 0.05 | 0.04 | 4 | 0.02 | 0.04 | 4 | 3.7 | 8.8 | 4 | 21.0 | 3.7 |
| S002 | 1 | 0.60 | 0.00 | 1 | -0.06 | 0.00 | 1 | 0.04 | 0.00 | 1 | -0.02 | 0.00 | 1 | -3.3 | 0.0 | 1 | 20.0 | 0.0 |
| S003 | 1 | 0.24 | 0.00 | 1 | 0.17 | 0.00 | 1 | 0.08 | 0.00 | 1 | 0.25 | 0.00 | 1 | 104.2 | 0.0 | 1 | 24.0 | 0.0 |
| S004 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.0 | 0.0 | 0 | 0.0 | 0.0 |
| ALL | 6 | 0.50 | 0.18 | 6 | 0.00 | 0.09 | 6 | 0.05 | 0.04 | 6 | 0.05 | 0.10 | 6 | 19.3 | 42.2 | 6 | 21.3 | 3.1 |

PROCESSED: 07:06:14 MAY 8, 1991

PERIOD OF ANALYSIS: 4- 1-91 TO 4-30-91

PAIR TYPE: EPA:MFR

```
*****************************
*                           *
*   PAIRED DATA ANALYSIS    *
*                           *
*   SUMMARY STATISTICS      *
*                           *
*****************************
```

```
RRRR    OOO    AAA   DDDD   L      OOO    AAA   DDDD
R   R  O   O  A   A  D   D  L     O   O  A   A  D   D
RRRR   O   O  AAAAA  D   D  L     O   O  AAAAA  D   D
R  R   O   O  A   A  D   D  L     O   O  A   A  D   D
R   R   OOO   A   A  DDDD   LLLLL  OOO   A   A  DDDD
```

COMMENTS:

COASTDOWN DATA:

- GASOLINE TESTS -

| | MFR TRK | | | MFR QCHK | | | EPA QCHK | | | (MFR-EPA) | | | ((M-E)/E)% | | | VFHP (M-E) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | NUM | AVG | STDEV | NUM | AVG | STDEV | NUM | AVG | STDEV | NUM | AVG | STDEV | NUM | AVG | STDEV | NUM | AVG | STDEV |
| 20 CHRYS | 2 | 14.69 | 0.81 | 2 | 14.80 | 1.37 | 2 | 14.45 | 1.01 | 2 | 0.35 | 0.36 | 2 | 2.31 | 2.33 | 2 | -0.34 | 0.27 |
| 30 FORD | 11 | 14.66 | 1.01 | 11 | 14.28 | 1.22 | 11 | 14.45 | 1.36 | 11 | -0.17 | 0.24 | 11 | -1.11 | 1.68 | 11 | 0.18 | 0.28 |
| 40 GM | 15 | 15.95 | 1.53 | 15 | 16.09 | 1.39 | 15 | 15.94 | 1.43 | 15 | 0.15 | 0.61 | 15 | 1.05 | 3.82 | 15 | -0.15 | 0.48 |
| 120 BMW | 1 | 17.46 | 0.00 | 1 | 18.47 | 0.00 | 1 | 18.20 | 0.00 | 1 | 0.27 | 0.00 | 1 | 1.48 | 0.00 | 1 | -0.20 | 0.00 |
| 200 MBZ | 3 | 18.39 | 2.74 | 3 | 17.66 | 1.87 | 3 | 16.41 | 3.30 | 3 | 1.25 | 1.86 | 3 | 9.38 | 14.62 | 3 | -1.39 | 2.18 |
| 260 HONDA | 1 | 15.11 | 0.00 | 1 | 15.32 | 0.00 | 1 | 14.92 | 0.00 | 1 | 0.40 | 0.00 | 1 | 2.68 | 0.00 | 1 | -0.39 | 0.00 |
| 305 JCI | 1 | 17.50 | 0.00 | 1 | 18.44 | 0.00 | 1 | 18.47 | 0.00 | 1 | -0.03 | 0.00 | 1 | -0.16 | 0.00 | 1 | 0.02 | 0.00 |
| 347 LIPHT | 1 | 0.00 | 0.00 | 1 | 0.00 | 0.00 | 1 | 0.00 | 0.00 | 1 | 0.00 | 0.00 | 1 | 0.00 | 0.00 | 1 | 0.00 | 0.00 |
| 380 NISSN | 2 | 13.32 | 0.24 | 2 | 13.43 | 0.64 | 2 | 13.18 | 0.62 | 2 | 0.24 | 0.02 | 2 | 1.86 | 0.07 | 2 | -0.24 | 0.01 |
| 440 R-R | 1 | 14.77 | 0.00 | 1 | 14.62 | 0.00 | 1 | 14.75 | 0.00 | 1 | -0.13 | 0.00 | 1 | -0.88 | 0.00 | 1 | 0.20 | 0.00 |
| 490 MITSH | 1 | 15.46 | 0.00 | 1 | 15.55 | 0.00 | 1 | 14.91 | 0.00 | 1 | 0.64 | 0.00 | 1 | 4.29 | 0.00 | 1 | -0.57 | 0.00 |
| 570 TOYOT | 1 | 14.36 | 0.00 | 1 | 14.31 | 0.00 | 1 | 14.46 | 0.00 | 1 | -0.15 | 0.00 | 1 | -1.04 | 0.00 | 1 | 0.19 | 0.00 |
| 590 V W | 5 | 17.79 | 1.21 | 5 | 16.78 | 1.09 | 5 | 17.60 | 1.08 | 5 | -0.82 | 0.41 | 5 | -4.66 | 2.23 | 5 | 0.56 | 0.29 |
| 640 AUDI | 1 | 18.41 | 0.00 | 1 | 15.66 | 0.00 | 1 | 17.67 | 0.00 | 1 | -2.01 | 0.00 | 1 | -11.38 | 0.00 | 1 | 1.65 | 0.00 |
| ALL | 46 | 15.51 | 2.97 | 46 | 15.31 | 2.86 | 46 | 15.30 | 2.94 | 46 | 0.01 | 0.78 | 46 | 0.26 | 5.29 | 46 | -0.04 | 0.76 |

PROCESSED: 07:06:11 MAY 8, 1991

PERIOD OF ANALYSIS: 4- 1-91 TO 4-30-91

PAIR TYPE: EPA:MFR

```
*********************************
*                               *
*     PAIRED DATA ANALYSIS      *
*                               *
*     SUMMARY STATISTICS        *
*                               *
*********************************
```

```
DDDD   EEEEE  L      SSSSS   III   TTTTT  EEEEE
D   D  E      L      S        I      T    E
D   D  EEE    L      SSSSS    I      T    EEE
D   D  E      L          S    I      T    E
DDDD   EEEEE  LLLLL  SSSSS   III     T    EEEEE
```

COMMENTS:

SIGNED DIFFERENCES: ( MFR - EPA ) - ALL FUELS -

| TP | SITE | HC | | | CO | | | CO2 | | | NOX | | | MPG | | | COUNT BY MFR GROUP | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | NUM | AVG | STDEV | NUM | AVG | STDEV | NUM | AVG | STDEV | NUM | AVG | STDEV | NUM | AVG | STDEV | AMC | CHR | FRD | GM | OTHR |
| FTP | | | | | | | | | | | | | | | | | | | | | |
| | D001 | 7 | -0.016 | 0.011 | 7 | -0.10 | 0.51 | 7 | -5.67 | 5.92 | 7 | -0.029 | 0.087 | 7 | 0.28 | 0.15 | 0 | 0 | 4 | 1 | 2 |
| | D002 | 6 | -0.012 | 0.024 | 6 | -0.00 | 0.19 | 6 | 3.88 | 13.10 | 6 | -0.024 | 0.084 | 6 | -0.14 | 0.53 | 0 | 0 | 1 | 1 | 4 |
| | D003 | 9 | -0.011 | 0.019 | 9 | -0.23 | 0.49 | 9 | 1.60 | 6.29 | 9 | -0.011 | 0.023 | 9 | 0.12 | 0.39 | 0 | 0 | 2 | 5 | 2 |
| | D004 | 5 | -0.012 | 0.045 | 5 | -0.23 | 0.43 | 5 | -2.64 | 9.22 | 5 | -0.033 | 0.033 | 5 | 0.22 | 0.45 | 0 | 0 | 1 | 3 | 1 |
| | D005 | 11 | 0.011 | 0.028 | 11 | -0.05 | 0.67 | 11 | -0.44 | 10.76 | 11 | -0.043 | 0.073 | 11 | 0.29 | 0.53 | 0 | 3 | 2 | 2 | 4 |
| | D006 | 4 | 0.013 | 0.046 | 4 | -0.17 | 0.20 | 4 | 4.45 | 9.00 | 4 | 0.020 | 0.048 | 4 | -0.30 | 0.56 | 0 | 0 | 1 | 1 | 2 |
| | D007 | 0 | 0.000 | 0.000 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.000 | 0.000 | 0 | 0.00 | 0.00 | 0 | 0 | 0 | 0 | 0 |
| | ALL | 42 | -0.004 | 0.029 | 42 | -0.12 | 0.48 | 42 | -0.05 | 9.34 | 42 | -0.024 | 0.063 | 42 | 0.13 | 0.47 | 0 | 3 | 11 | 13 | 15 |
| | A001 | 13 | -0.014 | 0.018 | 13 | -0.05 | 0.38 | 13 | -1.26 | 10.66 | 13 | -0.027 | 0.082 | 13 | 0.09 | 0.42 | 0 | 0 | 5 | 2 | 6 |
| | A002 | 14 | -0.011 | 0.029 | 14 | -0.23 | 0.45 | 14 | 0.09 | 7.41 | 14 | -0.019 | 0.028 | 14 | 0.15 | 0.40 | 0 | 0 | 3 | 8 | 3 |
| | A003 | 15 | 0.012 | 0.032 | 15 | -0.08 | 0.58 | 15 | 0.87 | 10.25 | 15 | -0.026 | 0.072 | 15 | 0.13 | 0.58 | 0 | 3 | 3 | 3 | 6 |
| | A004 | 0 | 0.000 | 0.000 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.000 | 0.000 | 0 | 0.00 | 0.00 | 0 | 0 | 0 | 0 | 0 |
| | ALL | 42 | -0.004 | 0.029 | 42 | -0.12 | 0.48 | 42 | -0.05 | 9.34 | 42 | -0.024 | 0.063 | 42 | 0.13 | 0.47 | 0 | 3 | 11 | 13 | 15 |
| HWFE | | | | | | | | | | | | | | | | | | | | | |
| | D001 | 7 | -0.003 | 0.018 | 7 | 0.01 | 0.16 | 7 | -4.53 | 4.91 | 7 | -0.143 | 0.279 | 7 | 0.51 | 0.38 | 0 | 0 | 3 | 1 | 3 |
| | D002 | 8 | 0.001 | 0.026 | 8 | -0.08 | 0.21 | 8 | 11.16 | 17.21 | 8 | 0.004 | 0.059 | 8 | -0.72 | 1.26 | 0 | 0 | 2 | 1 | 5 |
| | D003 | 9 | -0.001 | 0.033 | 9 | -0.05 | 0.13 | 9 | 2.24 | 4.34 | 9 | -0.028 | 0.081 | 9 | -0.13 | 0.55 | 0 | 0 | 1 | 6 | 2 |
| | D004 | 5 | 0.028 | 0.049 | 5 | 0.21 | 0.39 | 5 | 0.56 | 2.95 | 5 | -0.007 | 0.003 | 5 | 0.25 | 0.41 | 0 | 0 | 0 | 3 | 2 |
| | D005 | 11 | 0.015 | 0.033 | 11 | 0.09 | 0.20 | 11 | 1.40 | 3.00 | 11 | -0.019 | 0.126 | 11 | 0.09 | 0.38 | 0 | 2 | 2 | 2 | 5 |
| | D006 | 6 | 0.026 | 0.041 | 6 | 0.34 | 0.81 | 6 | 5.22 | 7.66 | 6 | -0.081 | 0.123 | 6 | -0.57 | 1.09 | 0 | 0 | 3 | 2 | 1 |
| | D007 | 0 | 0.000 | 0.000 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.000 | 0.000 | 0 | 0.00 | 0.00 | 0 | 0 | 0 | 0 | 0 |
| | ALL | 46 | 0.010 | 0.034 | 46 | 0.06 | 0.36 | 46 | 2.77 | 9.20 | 46 | -0.042 | 0.141 | 46 | -0.10 | 0.82 | 0 | 2 | 11 | 15 | 18 |
| | A001 | 15 | -0.001 | 0.022 | 15 | -0.04 | 0.19 | 15 | 3.84 | 14.97 | 15 | -0.065 | 0.202 | 15 | -0.14 | 1.12 | 0 | 0 | 5 | 2 | 8 |
| | A002 | 14 | 0.010 | 0.040 | 14 | 0.04 | 0.27 | 14 | 1.64 | 3.87 | 14 | -0.020 | 0.064 | 14 | 0.00 | 0.52 | 0 | 0 | 1 | 9 | 4 |
| | A003 | 17 | 0.019 | 0.035 | 17 | 0.18 | 0.49 | 17 | 2.75 | 5.24 | 17 | -0.041 | 0.125 | 17 | -0.14 | 0.75 | 0 | 2 | 5 | 4 | 6 |
| | A004 | 0 | 0.000 | 0.000 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.000 | 0.000 | 0 | 0.00 | 0.00 | 0 | 0 | 0 | 0 | 0 |
| | ALL | 46 | 0.010 | 0.034 | 46 | 0.06 | 0.36 | 46 | 2.77 | 9.20 | 46 | -0.042 | 0.141 | 46 | -0.10 | 0.82 | 0 | 2 | 11 | 15 | 18 |

PROCESSED: 07:06:11 MAY 8, 1991

PERIOD OF ANALYSIS: 4- 1-91 TO 4-30-91

PAIR TYPE: EPA:MFR

```
*********************************
*                               *
*     PAIRED DATA ANALYSIS      *
*                               *
*     SUMMARY STATISTICS        *
*                               *
*********************************
```

```
PPPP    CCCC  TTTTT  SSSSS   III   TTTTT  EEEEE
P   P  C        T    S       I       T    E
PPPP   C        T    SSSSS   I       T    EEE
P      C        T        S   I       T    E
P       CCCC    T    SSSSS   III     T    EEEEE
```

COMMENTS:

PERCENT DIFFERENCES: ((MFR - EPA)/EPA) X 100% - ALL FUELS -

| TP | SITE | HC | | | CO | | | CO2 | | | NOX | | | MPG | | | COUNT BY MFR GROUP | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | NUM | AVG | STDEV | NUM | AVG | STDEV | NUM | AVG | STDEV | NUM | AVG | STDEV | NUM | AVG | STDEV | AMC | CHR | FRD | GM | OTHR |
| FTP | | | | | | | | | | | | | | | | | | | | | |
| | D001 | 7 | -10.9 | 6.8 | 7 | -11.6 | 29.7 | 7 | -1.08 | 1.05 | 7 | -0.3 | 24.1 | 7 | 1.59 | 1.00 | 0 | 0 | 4 | 1 | 2 |
| | D002 | 6 | -6.2 | 10.5 | 6 | 0.3 | 19.4 | 6 | 0.99 | 2.68 | 6 | 1.0 | 30.7 | 6 | -0.56 | 2.87 | 0 | 0 | 1 | 1 | 4 |
| | D003 | 9 | -4.6 | 9.4 | 9 | -4.0 | 13.5 | 9 | 0.41 | 1.62 | 9 | -8.1 | 12.8 | 9 | 0.48 | 1.52 | 0 | 0 | 2 | 5 | 2 |
| | D004 | 5 | -8.1 | 25.2 | 5 | -10.7 | 23.1 | 5 | -0.38 | 2.36 | 5 | -10.9 | 8.2 | 5 | 1.27 | 2.07 | 0 | 0 | 1 | 3 | 1 |
| | D005 | 11 | 5.7 | 15.6 | 11 | 11.9 | 40.0 | 11 | -0.38 | 2.48 | 11 | -5.8 | 35.4 | 11 | 1.14 | 2.46 | 0 | 3 | 2 | 2 | 4 |
| | D006 | 4 | 2.7 | 24.7 | 4 | -11.9 | 16.9 | 4 | 1.55 | 2.55 | 4 | 3.5 | 17.2 | 4 | -0.94 | 2.28 | 0 | 0 | 1 | 1 | 2 |
| | D007 | 0 | 0.0 | 0.0 | 0 | 0.0 | 0.0 | 0 | 0.00 | 0.00 | 0 | 0.0 | 0.0 | 0 | 0.00 | 0.00 | 0 | 0 | 0 | 0 | 0 |
| | ALL | 42 | -2.9 | 15.6 | 42 | -2.0 | 27.6 | 42 | 0.05 | 2.18 | 42 | -4.1 | 24.3 | 42 | 0.65 | 2.15 | 0 | 3 | 11 | 13 | 15 |
| | A001 | 13 | -8.7 | 8.6 | 13 | -6.1 | 25.2 | 13 | -0.12 | 2.17 | 13 | 0.3 | 26.2 | 13 | 0.60 | 2.28 | 0 | 0 | 5 | 2 | 6 |
| | A002 | 14 | -5.9 | 15.9 | 14 | -6.4 | 17.0 | 14 | 0.13 | 1.87 | 14 | -9.1 | 11.1 | 14 | 0.76 | 1.70 | 0 | 0 | 3 | 8 | 3 |
| | A003 | 15 | 4.9 | 17.5 | 15 | 5.6 | 36.4 | 15 | 0.13 | 2.56 | 15 | -3.3 | 31.3 | 15 | 0.59 | 2.52 | 0 | 3 | 3 | 3 | 6 |
| | A004 | 0 | 0.0 | 0.0 | 0 | 0.0 | 0.0 | 0 | 0.00 | 0.00 | 0 | 0.0 | 0.0 | 0 | 0.00 | 0.00 | 0 | 0 | 0 | 0 | 0 |
| | ALL | 42 | -2.9 | 15.6 | 42 | -2.0 | 27.6 | 42 | 0.05 | 2.18 | 42 | -4.1 | 24.3 | 42 | 0.65 | 2.15 | 0 | 3 | 11 | 13 | 15 |
| HWFE | | | | | | | | | | | | | | | | | | | | | |
| | D001 | 7 | 32.2 | 145.4 | 7 | 68.8 | 281.4 | 7 | -1.40 | 1.64 | 7 | -1.0 | 54.2 | 7 | 1.80 | 1.31 | 0 | 0 | 3 | 1 | 3 |
| | D002 | 8 | 15.0 | 92.3 | 8 | -3.5 | 143.9 | 8 | 3.26 | 4.62 | 8 | 25.5 | 105.4 | 8 | -2.48 | 4.19 | 0 | 0 | 2 | 1 | 5 |
| | D003 | 9 | 2.7 | 44.9 | 9 | 5.2 | 43.8 | 9 | 1.06 | 1.63 | 9 | -48.6 | 45.9 | 9 | -0.26 | 1.57 | 0 | 0 | 1 | 6 | 2 |
| | D004 | 5 | 38.0 | 64.3 | 5 | 221.3 | 384.7 | 5 | 0.17 | 1.04 | 5 | -34.6 | 38.9 | 5 | 0.62 | 1.16 | 0 | 0 | 0 | 3 | 2 |
| | D005 | 11 | 58.2 | 81.4 | 11 | 97.5 | 133.6 | 11 | 0.41 | 1.14 | 11 | 32.9 | 139.7 | 11 | 0.24 | 1.04 | 0 | 2 | 2 | 2 | 5 |
| | D006 | 6 | 94.2 | 217.5 | 6 | 32.0 | 112.3 | 6 | 2.13 | 3.05 | 6 | -32.3 | 49.8 | 6 | -1.41 | 3.06 | 0 | 0 | 3 | 2 | 1 |
| | D007 | 0 | 0.0 | 0.0 | 0 | 0.0 | 0.0 | 0 | 0.00 | 0.00 | 0 | 0.0 | 0.0 | 0 | 0.00 | 0.00 | 0 | 0 | 0 | 0 | 0 |
| | ALL | 46 | 38.4 | 111.7 | 46 | 62.4 | 193.2 | 46 | 0.95 | 2.78 | 46 | -5.3 | 91.3 | 46 | -0.27 | 2.58 | 0 | 2 | 11 | 15 | 18 |
| | A001 | 15 | 23.0 | 115.8 | 15 | 30.3 | 213.8 | 15 | 1.09 | 4.20 | 15 | 13.1 | 83.7 | 15 | -0.48 | 3.80 | 0 | 0 | 5 | 2 | 8 |
| | A002 | 14 | 15.3 | 53.1 | 14 | 82.4 | 241.4 | 14 | 0.74 | 1.47 | 14 | -43.6 | 42.6 | 14 | 0.05 | 1.46 | 0 | 0 | 1 | 9 | 4 |
| | A003 | 17 | 70.9 | 138.7 | 17 | 74.4 | 127.1 | 17 | 1.01 | 2.11 | 17 | 9.9 | 118.3 | 17 | -0.34 | 2.07 | 0 | 2 | 5 | 4 | 6 |
| | A004 | 0 | 0.0 | 0.0 | 0 | 0.0 | 0.0 | 0 | 0.00 | 0.00 | 0 | 0.0 | 0.0 | 0 | 0.00 | 0.00 | 0 | 0 | 0 | 0 | 0 |
| | ALL | 46 | 38.4 | 111.7 | 46 | 62.4 | 193.2 | 46 | 0.95 | 2.78 | 46 | -5.3 | 91.3 | 46 | -0.27 | 2.58 | 0 | 2 | 11 | 15 | 18 |

PROCESSED: 07:06:10 MAY 8, 1991

PERIOD OF ANALYSIS: 4- 1-91 TO 4-30-91

PAIR TYPE: EPA:MFR

```
*****************************
*                           *   FFFFF  TTTTT  PPPP        RRRR   FFFFF   CCCC
*   PAIRED DATA ANALYSIS    *   F        T    P   P       R   R  F       C
*                           *   FFFF     T    PPPP        RRRR   FFFF    C
*   SUMMARY STATISTICS      *   F        T    P           R  R   R       C
*                           *   F        T    P           R   R  R        CCCC
*****************************
```

COMMENTS:
PERCENT DIFFERENCE: ((MFR - EPA)/EPA) X 100 % - GASOLINE ONLY -
**********

MPG PERCENT DIFFERENCE BY REASON FOR CONFIRMATION CODE

| | RANDOM AUDIT | | | FAILURE AT MFR | | | FE UP BY 1 OR MORE | | | NEW VEHICLE | | | FE CORR OFFSET | | | ALL OTHERS | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | NUM | AVG | STDEV | NUM | AVG | STDEV | NUM | AVG | STDEV | NUM | AVG | STDEV | NUM | AVG | STDEV | NUM | AVG | STDEV |
| 20 CHRYS | 1 | -0.53 | 0.00 | 1 | -0.67 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 1 | 3.24 | 0.00 |
| 30 FORD | 6 | 1.74 | 1.09 | 0 | 0.00 | 0.00 | 2 | 1.30 | 2.12 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 3 | 1.39 | 0.63 |
| 40 GM | 3 | -1.07 | 0.81 | 0 | 0.00 | 0.00 | 4 | -0.07 | 1.10 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 6 | 0.43 | 1.72 |
| 120 BMW | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 1 | 0.61 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 |
| 200 MBZ | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 3 | -1.67 | 3.31 |
| 260 HONDA | 1 | 1.30 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 2 | 2.44 | 2.14 |
| 305 JCI | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 1 | -2.37 | 0.00 |
| 380 NISSN | 2 | -1.21 | 3.98 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 |
| 440 R-R | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 1 | 2.12 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 |
| 570 TOYOT | 1 | -1.18 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 |
| 590 V W | 2 | 4.53 | 2.96 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 |
| 640 AUDI | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 1 | 1.84 | 0.00 |
| ALL | 16 | 0.84 | 2.44 | 1 | -0.67 | 0.00 | 7 | 0.42 | 1.33 | 1 | 2.12 | 0.00 | 0 | 0.00 | 0.00 | 17 | 0.55 | 2.29 |

PROCESSED: 07:06:14 MAY 8, 1991

PERIOD OF ANALYSIS: 4- 1-91 TO 4-30-91

PAIR TYPE: EPA:MFR

```
*****************************
*                           *   H   H  W   W  FFFFF  EEEEE        RRRR   FFFFF   CCCC
*   PAIRED DATA ANALYSIS    *   H   H  W   W  F      E            R   R  F       C
*                           *   HHHHH  W W W  FFFF   EEEE         RRRR   FFFF    C
*   SUMMARY STATISTICS      *   H   H  WW WW  F      E            R  R   R       C
*                           *   H   H  W   W  F      EEEEE        R   R  R        CCCC
*****************************
```

COMMENTS:
PERCENT DIFFERENCE: ((MFR - EPA)/EPA) X 100 % - GASOLINE ONLY -
**********

MPG PERCENT DIFFERENCE BY REASON FOR CONFIRMATION CODE

| | RANDOM AUDIT | | | FAILURE AT MFR | | | FE UP BY 1 OR MORE | | | NEW VEHICLE | | | FE CORR OFFSET | | | ALL OTHERS | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | NUM | AVG | STDEV | NUM | AVG | STDEV | NUM | AVG | STDEV | NUM | AVG | STDEV | NUM | AVG | STDEV | NUM | AVG | STDEV |
| 20 CHRYS | 1 | -0.72 | 0.00 | 1 | -0.06 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 |
| 30 FORD | 6 | 0.14 | 2.24 | 0 | 0.00 | 0.00 | 2 | 0.04 | 1.26 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 3 | 1.09 | 0.67 |
| 40 GM | 3 | -3.50 | 2.57 | 0 | 0.00 | 0.00 | 5 | 0.84 | 1.22 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 7 | 0.20 | 2.54 |
| 120 BMW | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 1 | -1.32 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 |
| 200 MBZ | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 3 | 1.02 | 2.04 |
| 260 HONDA | 1 | 1.64 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 |
| 305 JCI | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 1 | 0.23 | 0.00 |
| 347 LIPHT | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 1 | -10.85 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 |
| 380 NISSN | 2 | -1.50 | 4.21 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 |
| 440 R-R | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 1 | -3.11 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 |
| 490 MITSH | 1 | -0.46 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 |
| 570 TOYOT | 1 | -0.18 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 |
| 590 V W | 1 | 1.07 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 4 | 0.44 | 1.32 |
| 640 AUDI | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 1 | 0.29 | 0.00 |
| ALL | 16 | -0.71 | 2.50 | 1 | -0.06 | 0.00 | 8 | 0.37 | 1.29 | 2 | -6.98 | 5.47 | 0 | 0.00 | 0.00 | 19 | 0.53 | 1.76 |

MKA
A-91-46
IV-B-2

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
ANN ARBOR, MICHIGAN 48105

May 23, 1991

OFFICE OF
AIR AND RADIATION

MEMORANDUM

SUBJECT: Second Quarter Paired Data Report - FY 91

FROM: Robert Gilkey Robert Gilkey
Correlation and Engineering Services

TO: Eldert Bontekoe, Team Leader
Certification Branch

THRU: Martin Reineman, Manager MR
Correlation and Engineering Services

Attached is the paired data report for the second quarter of FY 91. The findings of this analysis are as follows:

1. Ford exceeded our limits for both HC and CO, averaging just over 10 percent lower than EPA. Ford has also retained a positive offset for both FTP and HFET fuel economy for the last six months. The fuel economy differences average about 1% for the quarter and are statistically significant.

2. Honda again shows an offset for coastdown times. This offset has been observed for over a year now, but it has not resulted in fuel economy correlation problems.

If you have additional questions on this report, please contact me.

Attachments

cc: T. Ball
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0168g

Technical Report

# Second Quarter Paired Data Report-FY 91

Robert Gilkey
May 1990

Program Development & Quality Staff
U.S. Environmental Protection Agency
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This report presents the paired data for the second quarter of fiscal year 1991.

The data are summarized in the following attachments:

| | |
|---|---|
| Attachment A | Monthly Paired Data Status Graphs. |
| Attachment B | Manufacturer Paired Data Status Graphs. |
| Attachment C | Data Presentation Methodology. |
| Appendix 1 | Testing Summary. |
| Appendix 2 | Absolute Differences and Percent Differences for the FTP. |
| Appendix 3 | Absolute Differences and Percent Differences for the HFET. |
| Appendix 4 | Evaporative Emission Data. |
| Appendix 5 | Roadload Data. |
| Appendix 6 | Absolute Differences and Percent Differences by Site. |
| Appendix 7 | FTP MPG and HFET MPG Percent Differences by Reason for Confirmation. |

Attachment A displays monthly means and three month running averages of data from the first and second quarters of FY 91. Attachment B contains monthly means and three month running averages of FTP and HFET fuel economy percent differences for Chrysler, Ford, GM and the combined averages of other manufacturers. Attachment C presents the data stratification used and screening limits applied to data for presentation in the other attachments. The Appendices present the paired data summary statistics.

## Conclusions

1. Ford exceeded our limits for both HC and CO, averaging just over 10% lower than EPA. Ford has also retained a positive offset for both FTP and HFET fuel economy for the last six months. The fuel economy differences average about 1% for the quarter and are statistically significant.

2. Honda again shows an offset for coastdown times. This offset has been observed for over a year now, but it has not resulted in fuel economy correlation problems.

Discussion

Statistical Observations:

Table 1 lists manufacturers' offsets which exceeded the levels listed below and showed a statistically significant difference using a paired t-test at the 95% confidence level. The paired t-test is based on an analysis of last test pairs with no paired data screens. All confirmation code strata are used for emissions analysis, while fuel economy analysis excludes the "up by 1 or more" reason for confirmation stratum.

| | |
|---|---|
| HC | -10% |
| CO | -10% |
| NOx | -10% |
| FTP Fuel Economy | +1.5% |
| HFET Fuel Economy | +1.5% |
| Quickcheck Coastdown Time | +2.0% |

Table 1

Second Quarter FY91
Percent Differences of Manufacturers Exceeding Acceptability Limits*

| | FTP | | | | | HFET | | | |
|---|---|---|---|---|---|---|---|---|---|
| Manufacturer | NUM | HC | CO | NOx | MPG | NUM | MPG | NUM | CDT |
| Ford | 13 | -10.3 | -10.8 | | | | | | |
| Mitsubishi | 4 | | | -48.4 | | | | | |
| Honda | | | | | | | | 3 | 4.6 |
| Hyundai | | | | | | 5 | 1.8 | | |
| SCAPD | 2 | | | | 23.3 | | ** | | |

* Percent difference = ((MFR-EPA)/EPA) x 100
** One HFET was at +20%

The Ford CO and Mitsubishi entries are new and do not represent long term trends or large absolute differences. SCAPD is a new ICI.

The Hyundai MPG difference will be investigated during a correlation program scheduled in May.

Honda has had a significant positive CDT offset for over a year now. Both Honda-Ann Arbor and Honda-Japan showed slight positive coastdown times in the 1991 JAMA correlation program. These positive offsets are not reflected in either fuel economy or emission offsets. Honda has been working with MVEL on dynamometer calibration practices as we attempt to resolve our differences in quickcheck coastdown time.

The Ford HC offset was also seen during the last quarter. The HC and CO offsets will be investigated as a part of a Ford/EPA correlation program which will begin soon.

Combined Manufacturer's Results:

Attachment A presents combined monthly and running averages of paired data.

Despite a slight positive HC and CO trend, the Attachment A parameters are acceptable for the quarter. The emissions trends are supported by the spring MVMA correlation program but not by the 1991 JAMA correlation program. For example, the HC and CO grand averages for the MVMA labs (including retests at the first test laboratory) were about +11 and +9%, respectively. We do not have tabular data from the 1991 JAMA program, but the graphical data suggests the JAMA-Japan and Ann Arbor area HC and CO data were similar to the MVEL data.

Overall, the industry continued to average within one percent of EPA for both FTP and HFET fuel economy for the quarter.

Selected Manufacturer Results:

Attachment B displays fuel economy and quickcheck coastdown monthly means and running averages as a function of manufacturer.

The Chrysler highway data does not represent a long term trend although they showed a statistically significant difference of about +1% for the quarter. The statistical significance of their positive FTP values is low.

The Ford FTP and HFET MPG data both show a positive bias for the six month period. Both are statistically significant for the quarter with differences of about +1% for each. While these values are not large, their persistence is notable and is being investigated.

Mitsubishi showed a statistically significant HFET difference of +1.4%. The 1991 JAMA program did not support this difference showing Mitsubishi results from carbon balance and metered highway data to be similar, or slightly lower, than EPA values.

Paired Data Summary Statistics:

Table 2 lists manufacturers data which were excluded from the status summary reports for exceeding one or more of the paired data rejection criteria in Attachment C.

Table 2

Second Quarter FY91
Tests Excluded for Exceeding Paired Data Rejection Criteria

| Manufacturer | Vehicle ID | VI | Parameter | Screening Limit | Test Result | EPA Value |
|---|---|---|---|---|---|---|
| GM | B41ER103 | 01 | %FTP NOx | +100 | 147.5 | 0.101 g/mi |
| Hyundai | Y2504C | 00 | %FTP NOx | +100 | 111.5 | 0.104 g/mi |
| SCAPD | AM4270003 | 00 | %FTP MPG | +15 | 25.2 | 21.6 mpg |
| Toyota | 92-UZ2 | 00 | %FTP NOx | +100 | 102.0 | 0.099 g/mi |

These tests were excluded from analysis in Attachments A and B and the Appendices.

All of the NOx rejections represented tests having absolute values much lower than the current 1.0 g/mi standard and also well below the tier 1 standard of 0.4 g/mi. At these absolute levels, these differences do not merit follow-up at this time. The SCAPD rejection was not verified because they did not retest.

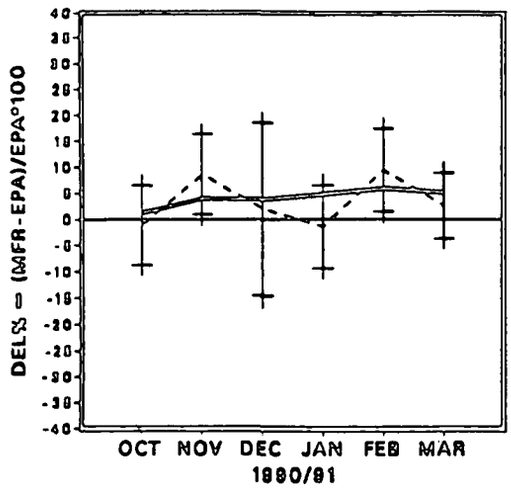
Attachments

# ATTACHMENT A

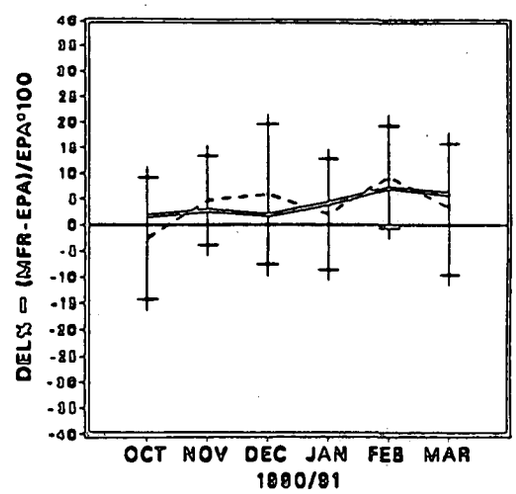
## Engineering Operations Division

## Monthly Paired Data Status Graphs

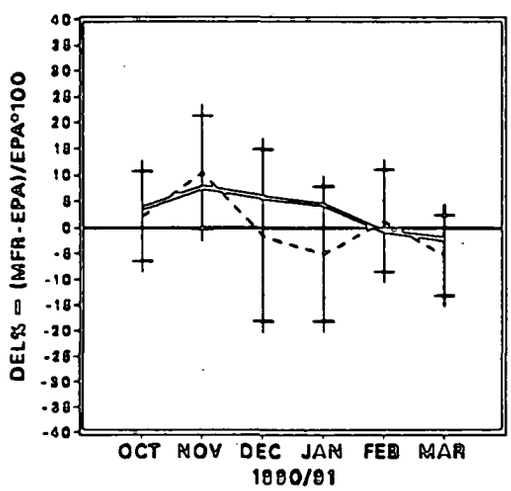
### FTP HC




### FTP CO




### FTP NOX



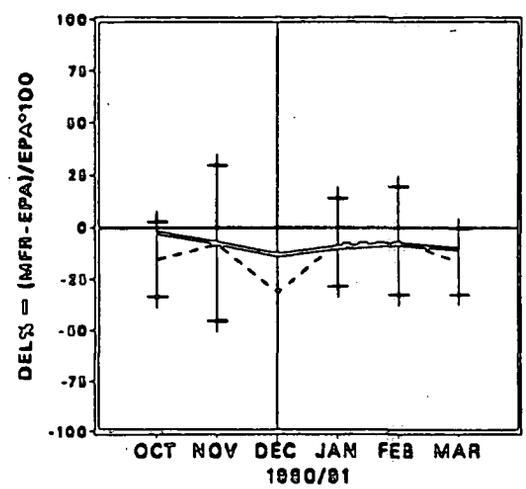

Legend

MONTHLY MEAN

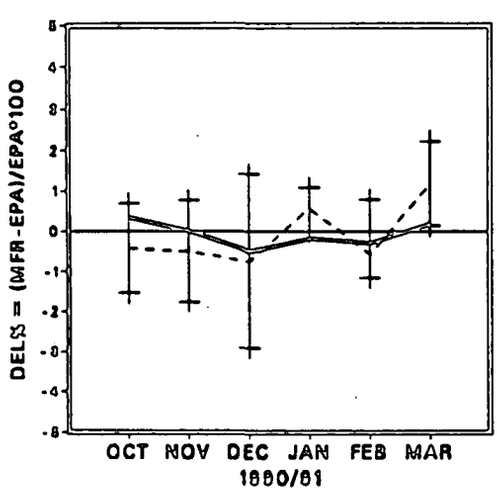
RUNNING AVERAGE

95% = Confidence Interval

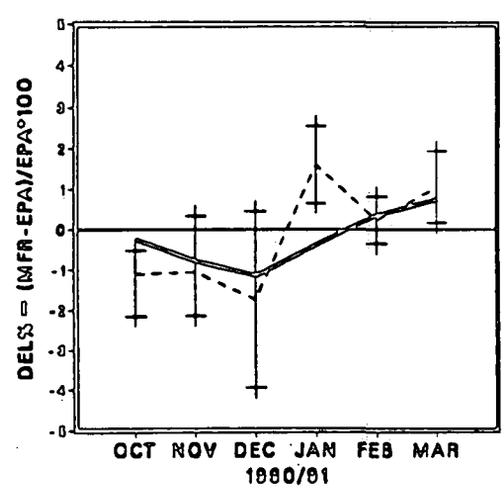
### EVAPORATIVE EMISSIONS




### FTP MPG



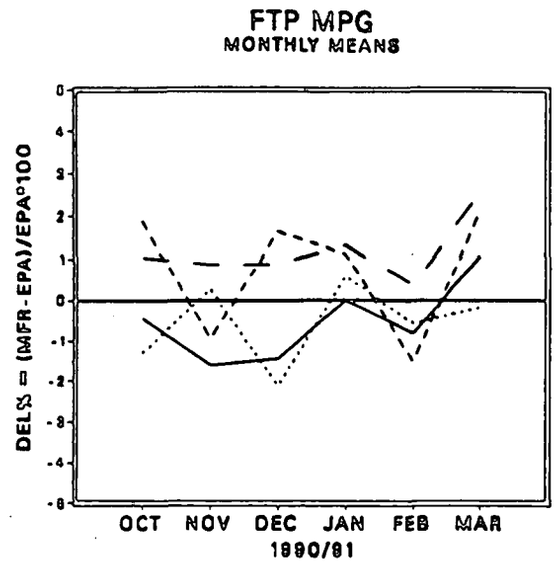

### HFET MPG

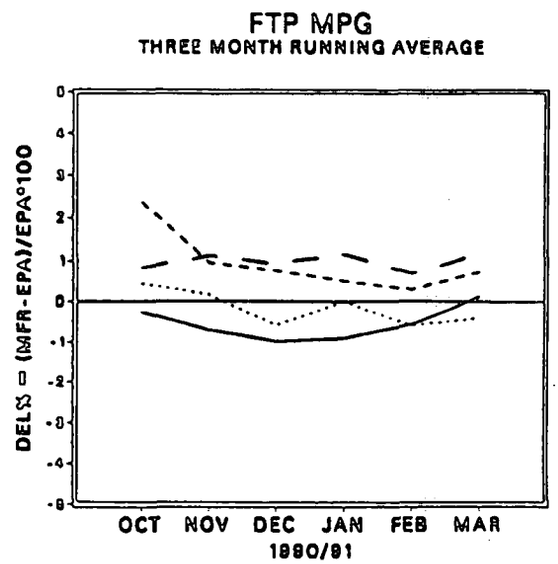


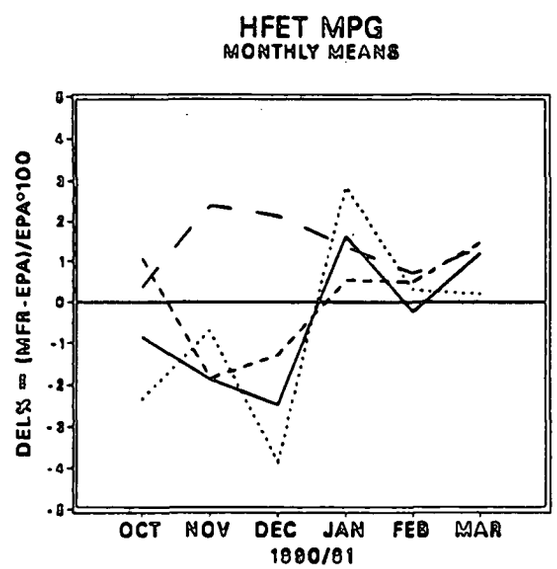
ATTACHMENT B

Engineering Operations Division

Manufacturer Paired Data Status Graphs



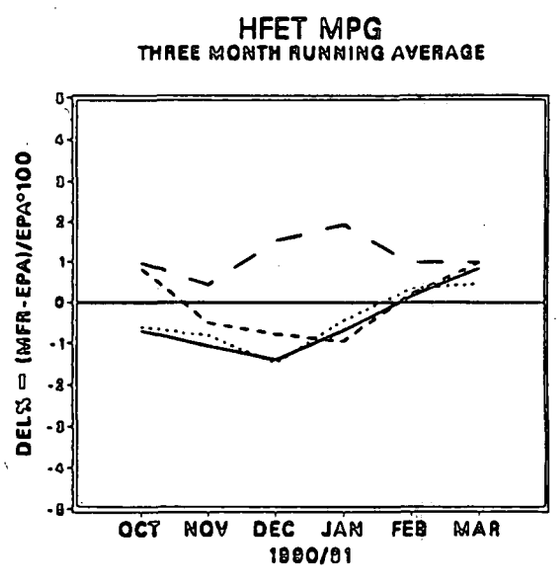

Legend

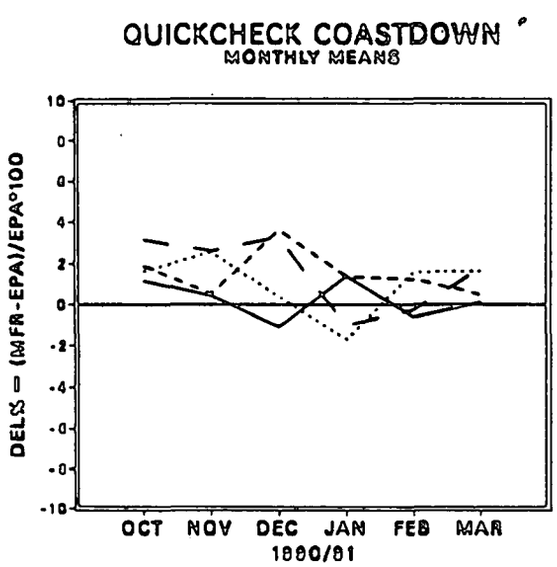
GM

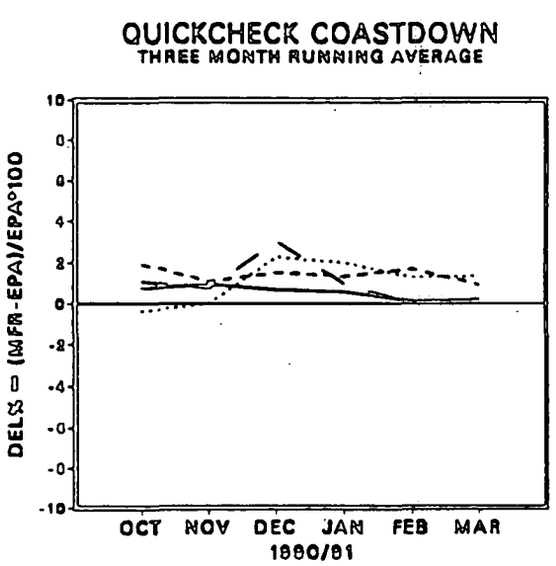
FORD

CHRYSLER

OTHERS



Engineering Operations Division **ATTACHMENT C**
Data Presentation Methodology

Graph Preparation:

Attachment A emission status graphs are based on an analysis of last tes pairs and all confirmation strata. All emissions data has had tests remove which exceed screening limits. These limits are presented below. Fuel economy status graphs are prepared in a similar manner except that the "FE by 1 or more" stratum has also been deleted.

Attachment B is developed using the same methodology as is used for Attachment A. It shows the monthly means and three month's running average for individual manufacturer's fuel economy and quickcheck coastdown times. The running averages for individual months are grand averages of results fr the month of interest and the two preceding months.

Summary Statistics Preparation:

The data in the appendix is based on an analysis of the last test pairs all strata, and has had pairs removed which exceed the following screening limits:

Paired Data Rejection Criteria

FTP

| | HC g/mi | CO g/mi | CO2 g/mi | NOx g/mi | FE g/mi | Evap g |
|---|---|---|---|---|---|---|
| Upper | 0.75 | 6.0 | 65.0 | 0.75 | 3.2 | |
| Lower | -0.75 | -6.0 | -65.0 | -0.75 | -3.2 | |
| FTP (% Difference) | | | | | | |
| Upper | 135.0 | 160.0 | 15.0 | 100.0 | 15.0 | * |
| Lower | -99.0 | -99.0 | -15.0 | -99.0 | -15.0 | * |

HFET

| | HC g/mi | CO g/mi | CO2 g/mi | NOx g/mi | FE g/mi | CDT sec |
|---|---|---|---|---|---|---|
| Upper | 0.2 | 6.0 | 45.0 | 1.0 | 4.5 | |
| Lower | -0.2 | -0.6 | -45.0 | -1.0 | -4.5 | |
| HFET (% Difference) | | | | | | |
| Upper | | | | | 15.0 | 15 |
| Lower | | | | | -15.0 | -15 |

* Values to be set in revised paired data program currently under development.

PROCESSED: 11:31:00 APR 9, 1991

CCID: SN8Z

PROJECT: 7030

NAME: BOB

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**************************
*                        *  TTTTT  EEEEE  SSSSS  TTTTT  SSSSS  U   U  M   M  SSSSS
*  PAIRED DATA ANALYSIS  *    T    E      S        T    S      U   U  MM MM  S
*                        *    T    EEE    SSSSS    T    SSSSS  U   U  M M M  SSSSS
*   SUMMARY STATISTICS   *    T    E          S    T        S  U   U  M   M      S
*                        *    T    EEEEE  SSSSS    T    SSSSS   UUU   M   M  SSSSS
**************************
```

PERIOD OF ANALYSIS: 1- 1-91 TO 3-31-91
PAIR TYPE: EPA:MFR
MODEL YEAR(S): ALL
FUEL TYPES: NO LEAD (IND HO), NO. 2 DIESEL
VEHICLE ADJUSTMENT: ALL VEHICLES
TEST(S) EXCLUDED: TEST PAIRS THAT ARE NOT THE LATEST FOR EACH VEHICLE

TEST TYPE(S): EMISSION DATA FUEL ECONOMY
ANALYZER(S): ALL
DYNAMOMETER(S): ALL
EVAP CLASS: EVAP AND NON EVAP
HIGH ALTITUDE: NO HIGH ALTITUDE VEHICLES INCLUDED

COMMENTS: FIRST QUARTER 91 P.D.; LAST PAIRS

| | FTP | | HWFE | |
|---|---|---|---|---|
| | GAS | DIESEL | GAS | DIESEL |
| | ****** | ****** | ****** | ****** |
| A. NUMBER OF VALID EPA PAIRS INCLUDED IN THE ANALYSIS | 85 | 0 | 93 | 0 |
| B. NUMBER OF VALID EPA PAIRS WITH EXTREME DATA EXCLUDED FROM THE ANALYSIS | 5 | 0 | 0 | 0 |
| C. NUMBER OF VALID EPA PAIRS NOT MEETING THE SELECTION CRITERIA | 9 | 0 | 11 | 0 |
| D. NUMBER OF VALID EPA TESTS WITH NO PAIRS OR NO PAIRS OF THIS PAIR TYPE | 15 | 0 | 20 | 0 |
| E. NUMBER OF VOID EPA TESTS | 21 | 0 | 5 | 0 |
| TOTAL NUMBER OF EPA TESTS IN THIS PERIOD | 135 | 0 | 129 | 0 |
| PAIRS MADE = (A+B+C) | 99 | 0 | 104 | 0 |
| POSSIBLE PAIRS = (A+B+C+D) | 114 | 0 | 124 | 0 |
| PERCENT PAIRED: ((A+B+C)/PPAIRS)*100% | 86.8 | 0.0 | 83.9 | 0.0 |
| PERCENT NOT PAIRED: (D/PPAIRS)*100% | 13.2 | 0.0 | 16.1 | 0.0 |
| | 100.0 | 0.0 | 100.0 | 0.0 |

```
                                        ******************************
PROCESSED: 11:31:01  APR  9, 1991       *                            *   FFFFF  TTTTT  PPPP   DDDD   EEEEE  L
                                        *   PAIRED DATA ANALYSIS     *   F        T    P   P  D   D  E      L
PERIOD OF ANALYSIS:  1- 1-91 TO  3-31-91 *                            *   FFF      T    PPPP   D   D  EEE    L
                                        *   SUMMARY STATISTICS       *   F        T    P      D   D  E      L
PAIR TYPE: EPA:MFR                      *                            *   F        T    P      DDDD   EEEEE  LLLLL
                                        ******************************
```

COMMENTS: FIRST QUARTER 91 P.D.; LAST PAIRS

SIGNED DIFFERENCES: (MFR - EPA) - GASOLINE ONLY -

| | HC | | | CO | | | CO2 | | | NOX | | | MPG | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | NUM | AVG | STDEV | NUM | AVG | STDEV | NUM | AVG | STDEV | NUM | AVG | STDEV | NUM | AVG | STDEV |
| 20 CHRYS | 12 | -0.001 | 0.051 | 12 | -0.23 | 0.61 | 12 | -0.8 | 11.4 | 12 | -0.038 | 0.081 | 12 | 0.12 | 0.34 |
| 30 FORD | 13 | -0.020 | 0.021 | 13 | -0.19 | 0.25 | 13 | -3.6 | 8.9 | 13 | -0.007 | 0.055 | 13 | 0.21 | 0.32 |
| 40 GM | 33 | 0.001 | 0.030 | 33 | -0.03 | 0.70 | 33 | 4.1 | 8.6 | 33 | -0.021 | 0.110 | 33 | 0.03 | 0.38 |
| 120 BMW | 1 | -0.007 | 0.000 | 1 | -0.20 | 0.00 | 1 | 7.3 | 0.0 | 1 | 0.054 | 0.000 | 1 | -0.23 | 0.00 |
| 260 HONDA | 3 | 0.003 | 0.014 | 3 | -0.09 | 0.30 | 3 | 11.3 | 5.3 | 3 | 0.028 | 0.018 | 3 | -0.29 | 0.30 |
| 265 HYNDA | 4 | -0.002 | 0.045 | 4 | -0.08 | 0.41 | 4 | 5.1 | 7.1 | 4 | 0.021 | 0.045 | 4 | 0.01 | 0.38 |
| 308 JBA | 1 | -0.089 | 0.000 | 1 | -0.01 | 0.00 | 1 | 1.3 | 0.0 | 1 | -0.144 | 0.000 | 1 | -0.03 | 0.00 |
| 347 LIPHT | 1 | 0.087 | 0.000 | 1 | 0.05 | 0.00 | 1 | 25.1 | 0.0 | 1 | -0.003 | 0.000 | 1 | -1.40 | 0.00 |
| 490 MITSH | 4 | 0.070 | 0.010 | 4 | 0.46 | 0.13 | 4 | 9.7 | 2.6 | 4 | -0.318 | 0.223 | 4 | -0.18 | 0.12 |
| 570 TOYOT | 8 | 0.040 | 0.030 | 8 | 0.23 | 0.19 | 8 | 3.5 | 4.8 | 8 | 0.017 | 0.049 | 8 | -0.07 | 0.51 |
| 603 WETLI | 1 | -0.210 | 0.000 | 1 | -1.11 | 0.00 | 1 | -14.9 | 0.0 | 1 | 0.136 | 0.000 | 1 | 0.38 | 0.00 |
| 660 FUJI | 4 | 0.020 | 0.025 | 4 | 0.15 | 0.21 | 4 | -0.4 | 2.2 | 4 | -0.065 | 0.084 | 4 | 0.33 | 0.16 |
| ALL | 85 | 0.003 | 0.046 | 85 | -0.05 | 0.55 | 85 | 2.6 | 9.2 | 85 | -0.029 | 0.116 | 85 | 0.04 | 0.40 |

```
PROCESSED: 11:31:01  APR  9, 1991          *****************************
                                           *                           *   FFFFF  TTTTT  PPPP   PPPP    CCCC  TTTTT
                                           *    PAIRED DATA ANALYSIS   *   F        T    P   P  P   P  C        T
PERIOD OF ANALYSIS:  1- 1-91 TO  3-31-91   *                           *   FFF      T    PPPP   PPPP   C        T
                                           *     SUMMARY STATISTICS    *   F        T    P      P      C        T
PAIR TYPE: EPA:MFR                         *                           *   F        T    P      P       CCCC    T
                                           *****************************
```

COMMENTS: FIRST QUARTER 91 P.D.; LAST PAIRS

PERCENT DIFFERENCES: ((MFR - EPA)/EPA) X 100% - GASOLINE ONLY -

| | HC | | | CO | | | CO2 | | | NOX | | | MPG | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | NUM | AVG | STDEV | NUM | AVG | STDEV | NUM | AVG | STDEV | NUM | AVG | STDEV | NUM | AVG | STDEV |
| 20 CHRYS | 12 | 5.0 | 13.9 | 12 | -3.4 | 20.1 | 12 | 0.06 | 2.02 | 12 | -11.3 | 23.9 | 12 | 0.86 | 2.06 |
| 30 FORD | 13 | -10.3 | 11.3 | 13 | -10.8 | 14.4 | 13 | -0.56 | 1.69 | 13 | 1.5 | 18.9 | 13 | 1.28 | 1.77 |
| 40 GM | 33 | 1.2 | 13.9 | 33 | 6.9 | 35.2 | 33 | 0.84 | 1.86 | 33 | -1.7 | 20.6 | 33 | 0.10 | 1.88 |
| 120 BMW | 1 | -4.2 | 0.0 | 1 | -16.3 | 0.0 | 1 | 1.69 | 0.00 | 1 | 71.1 | 0.0 | 1 | -1.13 | 0.00 |
| 260 HONDA | 3 | 1.6 | 7.6 | 3 | -4.2 | 19.4 | 3 | 2.84 | 1.34 | 3 | 20.4 | 18.3 | 3 | -1.30 | 1.37 |
| 265 HYNDA | 4 | 1.3 | 21.9 | 4 | -1.0 | 22.8 | 4 | 1.33 | 1.79 | 4 | 5.0 | 14.8 | 4 | 0.02 | 1.73 |
| 308 JBA | 1 | -23.5 | 0.0 | 1 | -0.5 | 0.0 | 1 | 0.26 | 0.00 | 1 | -19.4 | 0.0 | 1 | -0.18 | 0.00 |
| 347 LIPHT | 1 | 56.9 | 0.0 | 1 | 6.7 | 0.0 | 1 | 6.68 | 0.00 | 1 | -2.1 | 0.0 | 1 | -5.97 | 0.00 |
| 490 MITSH | 4 | 39.9 | 8.2 | 4 | 47.1 | 17.8 | 4 | 2.21 | 0.60 | 4 | -48.4 | 29.9 | 4 | -0.88 | 0.59 |
| 570 TOYOT | 8 | 33.5 | 24.1 | 8 | 31.6 | 19.6 | 8 | 0.91 | 1.23 | 8 | 8.7 | 22.9 | 8 | -0.36 | 1.80 |
| 603 WETLI | 1 | -44.4 | 0.0 | 1 | -43.9 | 0.0 | 1 | -2.38 | 0.00 | 1 | 51.9 | 0.0 | 1 | 2.71 | 0.00 |
| 660 FUJI | 4 | 13.0 | 16.3 | 4 | 22.4 | 34.0 | 4 | -0.12 | 0.56 | 4 | -17.6 | 40.5 | 4 | 1.49 | 0.65 |
| ALL | 85 | 5.2 | 21.2 | 85 | 6.0 | 30.4 | 85 | 0.67 | 1.94 | 85 | -2.2 | 26.4 | 85 | 0.25 | 1.96 |

PROCESSED: 11:31:04 APR 9, 1991

PERIOD OF ANALYSIS: 1- 1-91 TO 3-31-91

PAIR TYPE: EPA:MFR

```
*********************************
*                               *   H   H  W   W  FFFFF  EEEEE  DDDD   EEEEE  L
*     PAIRED DATA ANALYSIS      *   H   H  W   W  F      E      D   D  E      L
*                               *   HHHHH  W W W  FFF    EEE    D   D  EEE    L
*     SUMMARY STATISTICS        *   H   H  WW WW  F      E      D   D  E      L
*                               *   H   H  W   W  F      EEEEE  DDDD   EEEEE  LLLLL
*********************************
```

COMMENTS: FIRST QUARTER 91 P.D.; LAST PAIRS

SIGNED DIFFERENCES: (MFR - EPA) - GASOLINE ONLY -

| | HC | | | CO | | | CO2 | | | NOX | | | MPG | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | NUM | AVG | STDEV | NUM | AVG | STDEV | NUM | AVG | STDEV | NUM | AVG | STDEV | NUM | AVG | STDEV |
| 20 CHRYS | 14 | 0.004 | 0.017 | 14 | -0.02 | 0.27 | 14 | -3.4 | 7.1 | 14 | -0.046 | 0.066 | 14 | 0.33 | 0.36 |
| 30 FORD | 15 | -0.005 | 0.012 | 15 | -0.01 | 0.12 | 15 | -2.5 | 4.2 | 15 | -0.170 | 0.371 | 15 | 0.29 | 0.29 |
| 40 GM | 33 | -0.004 | 0.018 | 33 | 0.05 | 0.29 | 33 | -0.1 | 6.5 | 33 | -0.060 | 0.151 | 33 | 0.27 | 0.73 |
| 120 BMW | 1 | -0.005 | 0.000 | 1 | 0.02 | 0.00 | 1 | 12.5 | 0.0 | 1 | 0.020 | 0.000 | 1 | -1.39 | 0.00 |
| 260 HONDA | 3 | 0.001 | 0.004 | 3 | 0.04 | 0.04 | 3 | 8.5 | 0.5 | 3 | -0.046 | 0.030 | 3 | -0.60 | 0.14 |
| 265 HYNDA | 5 | 0.010 | 0.018 | 5 | -0.25 | 0.30 | 5 | -0.5 | 3.1 | 5 | 0.150 | 0.297 | 5 | 0.63 | 0.44 |
| 308 JBA | 1 | 0.101 | 0.000 | 1 | 0.43 | 0.00 | 1 | 3.2 | 0.0 | 1 | 0.073 | 0.000 | 1 | 0.00 | 0.00 |
| 347 LIPHT | 1 | 0.073 | 0.000 | 1 | 0.22 | 0.00 | 1 | 8.6 | 0.0 | 1 | -0.005 | 0.000 | 1 | -0.93 | 0.00 |
| 490 MITSH | 5 | 0.017 | 0.006 | 5 | 0.11 | 0.10 | 5 | -0.0 | 0.9 | 5 | -0.557 | 0.289 | 5 | 0.43 | 0.06 |
| 534 SCAPD | 1 | -0.029 | 0.000 | 1 | -1.30 | 0.00 | 1 | -42.7 | 0.0 | 1 | 0.390 | 0.000 | 1 | 6.16 | 0.00 |
| 570 TOYOT | 9 | 0.005 | 0.011 | 9 | 0.00 | 0.02 | 9 | 0.0 | 6.1 | 9 | 0.003 | 0.047 | 9 | 0.19 | 1.00 |
| 603 WETLI | 1 | 0.006 | 0.000 | 1 | -0.39 | 0.00 | 1 | -0.9 | 0.0 | 1 | 0.018 | 0.000 | 1 | 0.05 | 0.00 |
| 660 FUJI | 4 | -0.004 | 0.034 | 4 | 0.05 | 0.17 | 4 | 0.3 | 6.7 | 4 | 0.009 | 0.041 | 4 | 0.39 | 0.70 |
| ALL | 93 | 0.002 | 0.021 | 93 | -0.00 | 0.27 | 93 | -0.9 | 7.5 | 93 | -0.073 | 0.241 | 93 | 0.31 | 0.89 |

```
PROCESSED: 11:31:04  APR  9, 1991

PERIOD OF ANALYSIS:  1- 1-91 TO  3-31-91

PAIR TYPE: EPA:MFR

COMMENTS: FIRST QUARTER 91 P.D.; LAST PAIRS
```

```
*********************************
*                               *   H   H  W   W  FFFFF  EEEEE  PPPP    CCCC  TTTTT
*     PAIRED DATA ANALYSIS      *   H   H  W   W  F      E      P   P  C        T
*                               *   HHHHH  W W W  FFF    EEE    PPPP   C        T
*     SUMMARY STATISTICS        *   H   H  WW WW  F      E      P      C        T
*                               *   H   H  W   W  F      EEEEE  P       CCCC    T
*********************************
```

PERCENT DIFFERENCES: ((MFR - EPA)/EPA) X 100% - GASOLINE ONLY -

| | HC | | | CO | | | CO2 | | | NOX | | | MPG | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | NUM | AVG | STDEV | NUM | AVG | STDEV | NUM | AVG | STDEV | NUM | AVG | STDEV | NUM | AVG | STDEV |
| 20 CHRYS | 14 | 15.0 | 35.2 | 14 | 48.3 | 132.6 | 14 | -0.71 | 1.67 | 14 | -23.6 | 26.2 | 14 | 1.48 | 1.70 |
| 30 FORD | 15 | 8.1 | 91.6 | 15 | 49.2 | 182.7 | 15 | -0.58 | 1.18 | 15 | -13.4 | 35.8 | 15 | 1.23 | 1.20 |
| 40 GM | 33 | -3.9 | 50.5 | 33 | 168.5 | 311.9 | 33 | 0.01 | 2.27 | 33 | 9.5 | 91.6 | 33 | 0.92 | 2.26 |
| 120 BMW | 1 | -31.3 | 0.0 | 1 | 40.0 | 0.0 | 1 | 4.73 | 0.00 | 1 | 200.0 | 0.0 | 1 | -4.16 | 0.00 |
| 260 HONDA | 3 | 4.0 | 7.4 | 3 | 55.0 | 74.7 | 3 | 3.15 | 0.22 | 3 | -59.1 | 3.9 | 3 | -1.81 | 0.37 |
| 265 HYNDA | 5 | 47.1 | 54.3 | 5 | -64.7 | 47.8 | 5 | -0.20 | 1.19 | 5 | 351.9 | 500.5 | 5 | 1.81 | 1.29 |
| 308 JBA | 1 | 102.0 | 0.0 | 1 | 113.2 | 0.0 | 1 | 0.84 | 0.00 | 1 | 37.1 | 0.0 | 1 | 0.00 | 0.00 |
| 347 LIPHT | 1 | 197.3 | 0.0 | 1 | 550.0 | 0.0 | 1 | 3.23 | 0.00 | 1 | -55.6 | 0.0 | 1 | -2.81 | 0.00 |
| 490 MITSH | 5 | 130.0 | 58.2 | 5 | 540.0 | 493.0 | 5 | -0.01 | 0.29 | 5 | -80.6 | 22.4 | 5 | 1.42 | 0.21 |
| 534 SCAPD | 1 | -67.4 | 0.0 | 1 | -85.5 | 0.0 | 1 | -15.47 | 0.00 | 1 | 650.0 | 0.0 | 1 | 19.38 | 0.00 |
| 570 TOYOT | 9 | 38.7 | 59.1 | 9 | 95.8 | 302.1 | 9 | 0.21 | 2.39 | 9 | 32.0 | 51.1 | 9 | 0.67 | 2.63 |
| 603 WETLI | 1 | 3.3 | 0.0 | 1 | -22.7 | 0.0 | 1 | -0.18 | 0.00 | 1 | 12.4 | 0.0 | 1 | 0.29 | 0.00 |
| 660 FUJI | 4 | 2.0 | 39.7 | 4 | 172.5 | 215.6 | 4 | 0.23 | 2.50 | 4 | 96.9 | 183.9 | 4 | 1.29 | 2.20 |
| ALL | 93 | 17.8 | 66.9 | 93 | 125.4 | 280.3 | 93 | -0.15 | 2.56 | 93 | 26.7 | 166.3 | 93 | 1.12 | 2.78 |

PROCESSED: 11:31:02 APR 9, 1991

PERIOD OF ANALYSIS: 1- 1-91 TO 3-31-91

PAIR TYPE: EPA:MFR

```
*****************************
*                           *
*   PAIRED DATA ANALYSIS    *
*                           *
*    SUMMARY STATISTICS     *
*                           *
*****************************
```

```
EEEEE  V   V   AAA   PPPP   DDDD    AAA   TTTTT   AAA
E      V   V  A   A  P   P  D   D  A   A    T    A   A
EEE    V   V  AAAAA  PPPP   D   D  AAAAA    T    AAAAA
E       V V   A   A  P      D   D  A   A    T    A   A
EEEEE    V    A   A  P      DDDD   A   A    T    A   A
```

COMMENTS: FIRST QUARTER 91 P.D.; LAST PAIRS

DATA AND DIFFERENCES:
**********

| | EPA GM/TEST | | | (M-E) DIURNAL | | | (M-E) H.SOAK | | | (M-E) TOTAL | | | (M-E)/E % DIFF | | | EPA SOAK | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | NUM | AVG | STDEV | NUM | AVG | STDEV | NUM | AVG | STDEV | NUM | AVG | STDEV | NUM | AVG | STDEV | NUM | AVG | STDEV |
| 20 CHRYS | 8 | 0.83 | 0.36 | 8 | -0.18 | 0.28 | 8 | -0.05 | 0.10 | 8 | -0.23 | 0.29 | 8 | -34.8 | 31.6 | 8 | 17.0 | 2.4 |
| 30 FORD | 1 | 0.30 | 0.00 | 1 | 0.08 | 0.00 | 1 | -0.07 | 0.00 | 1 | 0.01 | 0.00 | 1 | 3.3 | 0.0 | 1 | 22.0 | 0.0 |
| 40 GM | 14 | 0.84 | 0.43 | 14 | -0.12 | 0.26 | 14 | 0.02 | 0.10 | 14 | -0.11 | 0.31 | 14 | -4.2 | 39.2 | 14 | 18.6 | 3.8 |
| 120 BMW | 1 | 0.98 | 0.00 | 1 | 0.00 | 0.00 | 1 | 0.02 | 0.00 | 1 | 0.02 | 0.00 | 1 | 2.0 | 0.0 | 1 | 16.0 | 0.0 |
| 260 HONDA | 1 | 0.76 | 0.00 | 1 | -0.34 | 0.00 | 1 | 0.07 | 0.00 | 1 | -0.27 | 0.00 | 1 | -35.5 | 0.0 | 1 | 16.0 | 0.0 |
| 265 HYNDA | 4 | 0.65 | 0.12 | 4 | -0.10 | 0.07 | 4 | -0.01 | 0.05 | 4 | -0.10 | 0.07 | 4 | -17.5 | 13.8 | 4 | 18.5 | 1.7 |
| 308 JBA | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.0 | 0.0 | 0 | 0.0 | 0.0 |
| 347 LIPHT | 1 | 1.10 | 0.00 | 1 | -0.02 | 0.00 | 1 | 0.21 | 0.00 | 1 | 0.19 | 0.00 | 1 | 17.3 | 0.0 | 1 | 16.0 | 0.0 |
| 490 MITSH | 1 | 0.64 | 0.00 | 1 | 0.03 | 0.00 | 1 | 0.03 | 0.00 | 1 | 0.06 | 0.00 | 1 | 9.4 | 0.0 | 1 | 17.0 | 0.0 |
| 570 TOYOT | 4 | 0.31 | 0.04 | 4 | -0.03 | 0.04 | 4 | 0.06 | 0.09 | 4 | 0.04 | 0.12 | 4 | 14.5 | 39.4 | 4 | 17.3 | 2.5 |
| 603 WETLI | 1 | 0.54 | 0.00 | 1 | 0.13 | 0.00 | 1 | -0.08 | 0.00 | 1 | 0.05 | 0.00 | 1 | 9.3 | 0.0 | 1 | 19.0 | 0.0 |
| 660 FUJI | 1 | 0.71 | 0.00 | 1 | -0.31 | 0.00 | 1 | 0.08 | 0.00 | 1 | -0.23 | 0.00 | 1 | -32.4 | 0.0 | 1 | 24.0 | 0.0 |
| ALL | 37 | 0.74 | 0.36 | 37 | -0.11 | 0.22 | 37 | 0.01 | 0.10 | 37 | -0.10 | 0.25 | 37 | -10.2 | 34.6 | 37 | 18.1 | 3.1 |

BY SHED: (EPA TESTS)
*******

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| S001 | 13 | 0.66 | 0.28 | 13 | -0.21 | 0.27 | 13 | -0.02 | 0.11 | 13 | -0.23 | 0.32 | 13 | -22.9 | 40.8 | 13 | 17.6 | 3.9 |
| S002 | 10 | 0.79 | 0.45 | 10 | -0.14 | 0.12 | 10 | 0.02 | 0.10 | 10 | -0.12 | 0.16 | 10 | -15.1 | 20.2 | 10 | 18.0 | 2.1 |
| S003 | 6 | 1.04 | 0.42 | 6 | 0.09 | 0.18 | 6 | 0.04 | 0.11 | 6 | 0.13 | 0.16 | 6 | 21.7 | 36.9 | 6 | 17.0 | 2.8 |
| S004 | 8 | 0.56 | 0.19 | 8 | -0.06 | 0.16 | 8 | 0.01 | 0.05 | 8 | -0.05 | 0.16 | 8 | -7.3 | 24.5 | 8 | 19.9 | 2.5 |
| ALL | 37 | 0.74 | 0.36 | 37 | -0.11 | 0.22 | 37 | 0.01 | 0.10 | 37 | -0.10 | 0.25 | 37 | -10.2 | 34.6 | 37 | 18.1 | 3.1 |

PROCESSED: 11:31:04 APR 9, 1991

PERIOD OF ANALYSIS: 1- 1-91 TO 3-31-91

PAIR TYPE: EPA:MFR

```
*************************
*                       *
*  PAIRED DATA ANALYSIS *
*                       *
*  SUMMARY STATISTICS   *
*                       *
*************************
```

```
RRRR    OOO    AAA   DDDD   L      OOO    AAA   DDDD
R   R  O   O  A   A  D   D  L      O   O  A   A  D   D
RRRR   O   O  AAAAA  D   D  L      O   O  AAAAA  D   D
R  R   O   O  A   A  D   D  L      O   O  A   A  D   D
R   R   OOO   A   A  DDDD   LLLLL   OOO   A   A  DDDD
```

COMMENTS: FIRST QUARTER 91 P.D.; LAST PAIRS

COASTDOWN DATA: - GASOLINE TESTS -

| | MFR TRK | | | MFR QCHK | | | EPA QCHK | | | (MFR-EPA) | | | ((M-E)/E)% | | | VFHP (M-E) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | NUM | AVG | STDEV | NUM | AVG | STDEV | NUM | AVG | STDEV | NUM | AVG | STDEV | NUM | AVG | STDEV | NUM | AVG | STDEV |
| 20 CHRYS | 14 | 13.80 | 2.25 | 14 | 13.76 | 2.33 | 14 | 13.61 | 2.26 | 14 | 0.15 | 0.20 | 14 | 1.08 | 1.61 | 14 | -0.16 | 0.40 |
| 30 FORD | 15 | 14.38 | 1.17 | 15 | 13.30 | 3.86 | 15 | 13.94 | 1.56 | 15 | -0.65 | 3.65 | 15 | -4.32 | 27.49 | 15 | -0.45 | 1.42 |
| 40 GM | 33 | 16.17 | 2.25 | 33 | 16.03 | 2.28 | 33 | 15.94 | 2.37 | 33 | 0.08 | 0.47 | 33 | 0.70 | 3.51 | 33 | -0.12 | 0.49 |
| 120 BMW | 1 | 17.00 | 0.00 | 1 | 15.53 | 0.00 | 1 | 15.79 | 0.00 | 1 | -0.26 | 0.00 | 1 | -1.65 | 0.00 | 1 | 0.22 | 0.00 |
| 260 HONDA | 3 | 15.11 | 0.02 | 3 | 15.61 | 0.06 | 3 | 14.93 | 0.22 | 3 | 0.68 | 0.19 | 3 | 4.57 | 1.33 | 3 | -0.63 | 0.17 |
| 265 HYNDA | 5 | 15.26 | 0.63 | 5 | 14.76 | 1.06 | 5 | 14.42 | 0.74 | 5 | 0.35 | 0.38 | 5 | 2.31 | 2.63 | 5 | -0.31 | 0.35 |
| 308 JBA | 1 | 0.00 | 0.00 | 1 | 0.00 | 0.00 | 1 | 0.00 | 0.00 | 1 | 0.00 | 0.00 | 1 | 0.00 | 0.00 | 1 | 0.00 | 0.00 |
| 347 LIPHT | 1 | 15.86 | 0.00 | 1 | 13.04 | 0.00 | 1 | 14.62 | 0.00 | 1 | -1.58 | 0.00 | 1 | -10.81 | 0.00 | 1 | 1.64 | 0.00 |
| 490 MITSH | 5 | 16.44 | 0.48 | 5 | 16.34 | 0.35 | 5 | 15.81 | 0.32 | 5 | 0.53 | 0.55 | 5 | 3.42 | 3.54 | 5 | -0.50 | 0.52 |
| 534 SCAPD | 1 | 0.00 | 0.00 | 1 | 0.00 | 0.00 | 1 | 0.00 | 0.00 | 1 | 0.00 | 0.00 | 1 | 0.00 | 0.00 | 1 | 0.00 | 0.00 |
| 570 TOYOT | 9 | 14.55 | 1.47 | 9 | 13.97 | 1.37 | 9 | 13.84 | 1.56 | 9 | 0.14 | 0.34 | 9 | 1.16 | 2.58 | 9 | -0.13 | 0.34 |
| 603 WETLI | 1 | 0.00 | 0.00 | 1 | 0.00 | 0.00 | 1 | 0.00 | 0.00 | 1 | 0.00 | 0.00 | 1 | 0.00 | 0.00 | 1 | 0.00 | 0.00 |
| 660 FUJI | 4 | 14.62 | 0.60 | 4 | 14.66 | 0.36 | 4 | 14.74 | 0.41 | 4 | -0.08 | 0.27 | 4 | -0.51 | 1.87 | 4 | 0.08 | 0.28 |
| ALL | 93 | 14.72 | 3.34 | 93 | 14.37 | 3.65 | 93 | 14.36 | 3.35 | 93 | 0.01 | 1.51 | 93 | 0.13 | 11.30 | 93 | -0.19 | 0.71 |

PROCESSED: 11:31:02 APR 9, 1991

PERIOD OF ANALYSIS: 1- 1-91 TO 3-31-91

PAIR TYPE: EPA:MFR

```
*********************************
*                               *   DDDD   EEEEE  L      SSSSS   III   TTTTT  EEEEE
*     PAIRED DATA ANALYSIS      *   D   D  E      L      S        I      T    E
*                               *   D   D  EEE    L      SSSSS    I      T    EEE
*     SUMMARY STATISTICS        *   D   D  E      L          S    I      T    E
*                               *   DDDD   EEEEE  LLLLL  SSSSS   III     T    EEEEE
*********************************
```

COMMENTS: FIRST QUARTER 91 P.D.; LAST PAIRS

SIGNED DIFFERENCES: ( MFR - EPA ) - ALL FUELS -

| TP | SITE | HC | | | CO | | | CO2 | | | NOX | | | MPG | | | COUNT BY MFR GROUP | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | NUM | AVG | STDEV | NUM | AVG | STDEV | NUM | AVG | STDEV | NUM | AVG | STDEV | NUM | AVG | STDEV | AMC | CHR | FRD | GM | OTHR |
| FTP | | | | | | | | | | | | | | | | | | | | | |
| | D001 | 23 | -0.004 | 0.068 | 23 | -0.09 | 0.57 | 23 | 3.38 | 7.33 | 23 | -0.018 | 0.132 | 23 | -0.00 | 0.30 | 0 | 4 | 1 | 7 | 11 |
| | D002 | 18 | 0.000 | 0.036 | 18 | -0.01 | 0.51 | 18 | 2.60 | 6.82 | 18 | -0.057 | 0.170 | 18 | 0.07 | 0.37 | 0 | 3 | 4 | 6 | 5 |
| | D003 | 4 | -0.008 | 0.025 | 4 | -0.31 | 0.60 | 4 | 2.57 | 17.64 | 4 | -0.061 | 0.072 | 4 | 0.00 | 0.53 | 0 | 0 | 1 | 3 | 0 |
| | D004 | 10 | 0.009 | 0.029 | 10 | 0.25 | 0.47 | 10 | 1.25 | 5.06 | 10 | -0.020 | 0.072 | 10 | 0.11 | 0.26 | 0 | 1 | 1 | 4 | 4 |
| | D005 | 16 | 0.001 | 0.041 | 16 | -0.16 | 0.63 | 16 | 1.40 | 14.28 | 16 | -0.007 | 0.067 | 16 | 0.05 | 0.54 | 0 | 3 | 4 | 6 | 3 |
| | D006 | 14 | 0.016 | 0.031 | 14 | -0.02 | 0.51 | 14 | 3.41 | 8.41 | 14 | -0.031 | 0.085 | 14 | -0.00 | 0.47 | 0 | 1 | 2 | 7 | 4 |
| | D007 | 0 | 0.000 | 0.000 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.000 | 0.000 | 0 | 0.00 | 0.00 | 0 | 0 | 0 | 0 | 0 |
| | ALL | 85 | 0.003 | 0.046 | 85 | -0.05 | 0.55 | 85 | 2.56 | 9.25 | 85 | -0.029 | 0.116 | 85 | 0.04 | 0.40 | 0 | 12 | 13 | 33 | 27 |
| | A001 | 41 | -0.002 | 0.056 | 41 | -0.06 | 0.54 | 41 | 3.04 | 7.04 | 41 | -0.035 | 0.149 | 41 | 0.03 | 0.33 | 0 | 7 | 5 | 13 | 16 |
| | A002 | 14 | 0.004 | 0.028 | 14 | 0.09 | 0.55 | 14 | 1.63 | 9.49 | 14 | -0.032 | 0.072 | 14 | 0.08 | 0.34 | 0 | 1 | 2 | 7 | 4 |
| | A003 | 30 | 0.008 | 0.037 | 30 | -0.10 | 0.57 | 30 | 2.34 | 11.76 | 30 | -0.018 | 0.076 | 30 | 0.02 | 0.50 | 0 | 4 | 6 | 13 | 7 |
| | A004 | 0 | 0.000 | 0.000 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.000 | 0.000 | 0 | 0.00 | 0.00 | 0 | 0 | 0 | 0 | 0 |
| | ALL | 85 | 0.003 | 0.046 | 85 | -0.05 | 0.55 | 85 | 2.56 | 9.25 | 85 | -0.029 | 0.116 | 85 | 0.04 | 0.40 | 0 | 12 | 13 | 33 | 27 |
| HWFE | | | | | | | | | | | | | | | | | | | | | |
| | D001 | 28 | 0.007 | 0.023 | 28 | -0.02 | 0.39 | 28 | -5.22 | 9.63 | 28 | -0.056 | 0.194 | 28 | 0.74 | 1.16 | 0 | 7 | 2 | 8 | 11 |
| | D002 | 21 | -0.001 | 0.020 | 21 | 0.02 | 0.23 | 21 | -0.43 | 4.12 | 21 | -0.131 | 0.334 | 21 | 0.25 | 0.39 | 0 | 2 | 8 | 5 | 6 |
| | D003 | 2 | -0.006 | 0.005 | 2 | -0.02 | 0.09 | 2 | 2.15 | 0.35 | 2 | -0.102 | 0.407 | 2 | 0.02 | 0.08 | 0 | 0 | 0 | 2 | 0 |
| | D004 | 8 | -0.001 | 0.027 | 8 | 0.04 | 0.18 | 8 | -0.05 | 5.88 | 8 | 0.018 | 0.237 | 8 | 0.26 | 0.52 | 0 | 2 | 0 | 3 | 3 |
| | D005 | 18 | 0.001 | 0.023 | 18 | 0.00 | 0.17 | 18 | 0.02 | 6.24 | 18 | -0.094 | 0.210 | 18 | 0.23 | 0.71 | 0 | 2 | 4 | 7 | 5 |
| | D006 | 16 | 0.000 | 0.015 | 16 | -0.03 | 0.25 | 16 | 4.23 | 5.42 | 16 | -0.047 | 0.202 | 16 | -0.23 | 0.90 | 0 | 1 | 1 | 8 | 6 |
| | D007 | 0 | 0.000 | 0.000 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.000 | 0.000 | 0 | 0.00 | 0.00 | 0 | 0 | 0 | 0 | 0 |
| | ALL | 93 | 0.002 | 0.021 | 93 | -0.00 | 0.27 | 93 | -0.90 | 7.50 | 93 | -0.073 | 0.241 | 93 | 0.31 | 0.89 | 0 | 14 | 15 | 33 | 31 |
| | A001 | 49 | 0.004 | 0.022 | 49 | -0.00 | 0.33 | 49 | -3.17 | 8.06 | 49 | -0.088 | 0.263 | 49 | 0.53 | 0.94 | 0 | 9 | 10 | 13 | 17 |
| | A002 | 10 | -0.002 | 0.024 | 10 | 0.03 | 0.17 | 10 | 0.39 | 5.27 | 10 | -0.006 | 0.255 | 10 | 0.21 | 0.47 | 0 | 2 | 0 | 5 | 3 |
| | A003 | 34 | 0.000 | 0.019 | 34 | -0.01 | 0.20 | 34 | 2.00 | 6.16 | 34 | -0.072 | 0.205 | 34 | 0.02 | 0.82 | 0 | 3 | 5 | 15 | 11 |
| | A004 | 0 | 0.000 | 0.000 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.000 | 0.000 | 0 | 0.00 | 0.00 | 0 | 0 | 0 | 0 | 0 |
| | ALL | 93 | 0.002 | 0.021 | 93 | -0.00 | 0.27 | 93 | -0.90 | 7.50 | 93 | -0.073 | 0.241 | 93 | 0.31 | 0.89 | 0 | 14 | 15 | 33 | 31 |

PROCESSED: 11:31:02 APR 9, 1991

PERIOD OF ANALYSIS: 1- 1-91 TO 3-31-91

PAIR TYPE: EPA:MFR

```
*********************************
*                               *   PPPP    CCCC  TTTTT  SSSSS   III   TTTTT  EEEEE
*     PAIRED DATA ANALYSIS      *   P   P  C        T    S       I      T    E
*                               *   PPPP   C        T    SSSSS   I      T    EEE
*     SUMMARY STATISTICS        *   P      C        T        S   I      T    E
*                               *   P       CCCC    T    SSSSS  III     T    EEEEE
*********************************
```

COMMENTS: FIRST QUARTER 91 P.D.; LAST PAIRS

PERCENT DIFFERENCES: ((MFR - EPA)/EPA) X 100% - ALL FUELS -

| TP | SITE | HC | | | CO | | | CO2 | | | NOX | | | MPG | | | COUNT BY MFR GROUP | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | NUM | AVG | STDEV | NUM | AVG | STDEV | NUM | AVG | STDEV | NUM | AVG | STDEV | NUM | AVG | STDEV | AMC | CHR | FRD | GM | OTHR |
| FTP | | | | | | | | | | | | | | | | | | | | | |
| | D001 | 23 | 6.4 | 28.5 | 23 | 6.5 | 26.5 | 23 | 0.85 | 1.63 | 23 | 2.4 | 31.3 | 23 | 0.02 | 1.46 | 0 | 4 | 1 | 7 | 11 |
| | D002 | 18 | 2.9 | 17.7 | 18 | 4.5 | 26.5 | 18 | 0.61 | 1.53 | 18 | -8.2 | 25.8 | 18 | 0.30 | 1.61 | 0 | 3 | 4 | 6 | 5 |
| | D003 | 4 | -4.1 | 14.6 | 4 | -18.2 | 28.4 | 4 | 0.72 | 3.34 | 4 | -9.8 | 15.0 | 4 | 0.23 | 3.22 | 0 | 0 | 1 | 3 | 0 |
| | D004 | 10 | 5.8 | 16.8 | 10 | 17.0 | 35.0 | 10 | 0.34 | 1.15 | 10 | 7.2 | 34.5 | 10 | 0.59 | 1.27 | 0 | 1 | 1 | 4 | 4 |
| | D005 | 16 | 4.7 | 20.6 | 16 | 3.2 | 39.9 | 16 | 0.49 | 2.79 | 16 | -1.9 | 17.4 | 16 | 0.50 | 2.89 | 0 | 3 | 4 | 6 | 3 |
| | D006 | 14 | 8.8 | 18.3 | 14 | 9.1 | 25.9 | 14 | 0.88 | 2.01 | 14 | -6.9 | 23.6 | 14 | 0.04 | 2.08 | 0 | 1 | 2 | 7 | 4 |
| | D007 | 0 | 0.0 | 0.0 | 0 | 0.0 | 0.0 | 0 | 0.00 | 0.00 | 0 | 0.0 | 0.0 | 0 | 0.00 | 0.00 | 0 | 0 | 0 | 0 | 0 |
| | ALL | 85 | 5.2 | 21.2 | 85 | 6.0 | 30.4 | 85 | 0.67 | 1.94 | 85 | -2.2 | 26.4 | 85 | 0.25 | 1.96 | 0 | 12 | 13 | 33 | 27 |
| | A001 | 41 | 4.8 | 24.1 | 41 | 5.6 | 26.2 | 41 | 0.74 | 1.57 | 41 | -2.2 | 29.2 | 41 | 0.15 | 1.52 | 0 | 7 | 5 | 13 | 16 |
| | A002 | 14 | 3.0 | 16.3 | 14 | 7.0 | 36.2 | 14 | 0.44 | 1.88 | 14 | 2.4 | 30.6 | 14 | 0.49 | 1.88 | 0 | 1 | 2 | 7 | 4 |
| | A003 | 30 | 6.6 | 19.3 | 30 | 6.0 | 33.7 | 30 | 0.67 | 2.42 | 30 | -4.2 | 20.3 | 30 | 0.29 | 2.51 | 0 | 4 | 6 | 13 | 7 |
| | A004 | 0 | 0.0 | 0.0 | 0 | 0.0 | 0.0 | 0 | 0.00 | 0.00 | 0 | 0.0 | 0.0 | 0 | 0.00 | 0.00 | 0 | 0 | 0 | 0 | 0 |
| | ALL | 85 | 5.2 | 21.2 | 85 | 6.0 | 30.4 | 85 | 0.67 | 1.94 | 85 | -2.2 | 26.4 | 85 | 0.25 | 1.96 | 0 | 12 | 13 | 33 | 27 |
| HWFE | | | | | | | | | | | | | | | | | | | | | |
| | D001 | 28 | 24.4 | 60.9 | 28 | 57.0 | 183.2 | 28 | -1.56 | 3.22 | 28 | 8.3 | 132.4 | 28 | 2.57 | 3.71 | 0 | 7 | 2 | 8 | 11 |
| | D002 | 21 | 17.2 | 83.1 | 21 | 187.0 | 300.8 | 21 | -0.00 | 1.35 | 21 | -14.2 | 44.1 | 21 | 0.92 | 1.28 | 0 | 2 | 8 | 5 | 6 |
| | D003 | 2 | -17.6 | 8.0 | 2 | 425.0 | 671.8 | 2 | 0.79 | 0.11 | 2 | -9.4 | 53.9 | 2 | 0.07 | 0.24 | 0 | 0 | 0 | 2 | 0 |
| | D004 | 8 | 35.5 | 83.9 | 8 | 42.9 | 149.2 | 8 | 0.08 | 1.87 | 8 | 99.0 | 323.9 | 8 | 0.92 | 1.82 | 0 | 2 | 0 | 3 | 3 |
| | D005 | 18 | 17.8 | 69.6 | 18 | 175.7 | 346.4 | 18 | 0.07 | 2.16 | 18 | -14.6 | 46.0 | 18 | 0.84 | 2.25 | 0 | 2 | 4 | 7 | 5 |
| | D006 | 16 | 2.8 | 46.5 | 16 | 111.4 | 302.4 | 16 | 1.64 | 2.21 | 16 | 127.2 | 255.3 | 16 | -0.59 | 2.42 | 0 | 1 | 1 | 8 | 6 |
| | D007 | 0 | 0.0 | 0.0 | 0 | 0.0 | 0.0 | 0 | 0.00 | 0.00 | 0 | 0.0 | 0.0 | 0 | 0.00 | 0.00 | 0 | 0 | 0 | 0 | 0 |
| | ALL | 93 | 17.8 | 66.9 | 93 | 125.4 | 280.3 | 93 | -0.15 | 2.56 | 93 | 26.7 | 166.3 | 93 | 1.12 | 2.78 | 0 | 14 | 15 | 33 | 31 |
| | A001 | 49 | 21.3 | 70.5 | 49 | 112.7 | 246.6 | 49 | -0.89 | 2.68 | 49 | -1.4 | 103.9 | 49 | 1.86 | 3.02 | 0 | 9 | 10 | 13 | 17 |
| | A002 | 10 | 24.8 | 77.4 | 10 | 119.3 | 305.7 | 10 | 0.22 | 1.68 | 10 | 77.3 | 289.9 | 10 | 0.75 | 1.64 | 0 | 2 | 0 | 5 | 3 |
| | A003 | 34 | 10.8 | 59.4 | 34 | 145.4 | 323.2 | 34 | 0.81 | 2.30 | 34 | 52.1 | 189.5 | 34 | 0.17 | 2.41 | 0 | 3 | 5 | 15 | 11 |
| | A004 | 0 | 0.0 | 0.0 | 0 | 0.0 | 0.0 | 0 | 0.00 | 0.00 | 0 | 0.0 | 0.0 | 0 | 0.00 | 0.00 | 0 | 0 | 0 | 0 | 0 |
| | ALL | 93 | 17.8 | 66.9 | 93 | 125.4 | 280.3 | 93 | -0.15 | 2.56 | 93 | 26.7 | 166.3 | 93 | 1.12 | 2.78 | 0 | 14 | 15 | 33 | 31 |

# Appendix 7

PROCESSED: 11:31:02 APR 9, 1991

PERIOD OF ANALYSIS: 1- 1-91 TO 3-31-91

PAIR TYPE: EPA:MFR

```
*****************************
*                           *   FFFFF  TTTTT  PPPP        RRRR   FFFFF   CCCC
*   PAIRED DATA ANALYSIS    *   F        T    P   P       R   R  F       C
*                           *   FFFF     T    PPPP        RRRR   FFFF    C
*    SUMMARY STATISTICS     *   F        T    P           R   R  R       C
*                           *   F        T    P           R   R  R        CCCC
*****************************
```

COMMENTS: FIRST QUARTER 91 P.D.; LAST PAIRS
PERCENT DIFFERENCE: ((MFR - EPA)/EPA) X 100 % - GASOLINE ONLY -
**********

MPG PERCENT DIFFERENCE BY REASON FOR CONFIRMATION CODE

| | RANDOM AUDIT | | | FAILURE AT MFR | | | FE UP BY 1 OR MORE | | | NEW VEHICLE | | | FE CORR OFFSET | | | ALL OTHERS | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | NUM | AVG | STDEV | NUM | AVG | STDEV | NUM | AVG | STDEV | NUM | AVG | STDEV | NUM | AVG | STDEV | NUM | AVG | STDEV |
| 20 CHRYS | 4 | 1.20 | 3.19 | 0 | 0.00 | 0.00 | 2 | 1.46 | 1.59 | 1 | -0.14 | 0.00 | 0 | 0.00 | 0.00 | 5 | 0.54 | 1.66 |
| 30 FORD | 8 | 1.34 | 1.86 | 0 | 0.00 | 0.00 | 1 | 2.77 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 4 | 0.81 | 1.84 |
| 40 GM | 9 | 0.99 | 2.60 | 1 | -2.86 | 0.00 | 3 | -0.10 | 1.37 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 20 | -0.12 | 1.41 |
| 120 BMW | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 1 | -1.13 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 |
| 260 HONDA | 1 | -1.55 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 2 | -1.17 | 1.91 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 |
| 265 HYNDA | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 4 | 0.02 | 1.73 |
| 308 JBA | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 1 | -0.18 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 |
| 347 LIPHT | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 1 | -5.97 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 |
| 490 MITSH | 2 | -1.13 | 0.06 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 2 | -0.63 | 0.90 |
| 570 TOYOT | 1 | -2.43 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 4 | 0.50 | 1.92 | 0 | 0.00 | 0.00 | 3 | -0.81 | 1.36 |
| 603 WETLI | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 1 | 2.71 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 |
| 660 FUJI | 2 | 2.02 | 0.12 | 0 | 0.00 | 0.00 | 1 | 1.23 | 0.00 | 1 | 0.69 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 |
| ALL | 27 | 0.82 | 2.31 | 1 | -2.86 | 0.00 | 7 | 0.95 | 1.50 | 12 | -0.36 | 2.37 | 0 | 0.00 | 0.00 | 38 | -0.00 | 1.47 |

PROCESSED: 11:31:04 APR 9, 1991

PERIOD OF ANALYSIS: 1- 1-91 TO 3-31-91

PAIR TYPE: EPA:MFR

```
*****************************
*                           *   H   H  W   W  FFFFF  EEEEE        RRRR   FFFFF   CCCC
*   PAIRED DATA ANALYSIS    *   H   H  W   W  F      E            R   R  F      C
*                           *   HHHHH  W W W  FFFF   EEEE         RRRR   FFFF   C
*    SUMMARY STATISTICS     *   H   H  WW WW  F      E            R  R   R      C
*                           *   H   H  W   W  F      EEEEE        R   R  R       CCCC
*****************************
```

COMMENTS: FIRST QUARTER 91 P.D.; LAST PAIRS
PERCENT DIFFERENCE: ((MFR - EPA)/EPA) X 100 % - GASOLINE ONLY -
**********

MPG PERCENT DIFFERENCE BY REASON FOR CONFIRMATION CODE

| | RANDOM AUDIT | | | FAILURE AT MFR | | | FE UP BY 1 OR MORE | | | NEW VEHICLE | | | FE CORR OFFSET | | | ALL OTHERS | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | NUM | AVG | STDEV | NUM | AVG | STDEV | NUM | AVG | STDEV | NUM | AVG | STDEV | NUM | AVG | STDEV | NUM | AVG | STDEV |
| 20 CHRYS | 4 | 0.45 | 1.01 | 0 | 0.00 | 0.00 | 4 | 2.72 | 2.16 | 1 | 1.08 | 0.00 | 0 | 0.00 | 0.00 | 5 | 1.40 | 1.58 |
| 30 FORD | 8 | 0.93 | 0.95 | 0 | 0.00 | 0.00 | 2 | 2.76 | 1.82 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 5 | 1.09 | 1.12 |
| 40 GM | 9 | 2.27 | 2.80 | 0 | 0.00 | 0.00 | 2 | 2.17 | 0.36 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 22 | 0.26 | 1.85 |
| 120 BMW | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 1 | -4.16 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 |
| 260 HONDA | 1 | -1.42 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 2 | -2.00 | 0.21 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 |
| 265 HYNDA | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 5 | 1.81 | 1.29 |
| 308 JBA | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 1 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 |
| 347 LIPHT | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 1 | -2.81 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 |
| 490 MITSH | 2 | 1.27 | 0.10 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 3 | 1.53 | 0.21 |
| 534 SCAPD | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 1 | 19.38 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 |
| 570 TOYOT | 1 | -4.59 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 4 | 1.45 | 1.44 | 0 | 0.00 | 0.00 | 4 | 1.21 | 2.43 |
| 603 WETLI | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 1 | 0.29 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 |
| 660 FUJI | 2 | -0.51 | 0.98 | 0 | 0.00 | 0.00 | 1 | 2.59 | 0.00 | 1 | 3.62 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 |
| ALL | 27 | 0.93 | 2.24 | 0 | 0.00 | 0.00 | 9 | 2.59 | 1.50 | 13 | 1.48 | 5.84 | 0 | 0.00 | 0.00 | 44 | 0.83 | 1.72 |

MER

A-91-46
IV-B-2

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
ANN ARBOR, MICHIGAN 48105

April 9, 1991

OFFICE OF
AIR AND RADIATION

MEMORANDUM

SUBJECT: Monthly Paired Data - February, 1991

FROM: Daniel C. Stokes, Mechanical Engineering Technician
Correlation and Engineering Services

Dan Stokes

TO: Eldert Bontekoe, Team Leader
Certification Branch

THRU: Martin E. Reineman, Manager
Correlation and Engineering Services

S Hackett for MER

This report presents the paired data for February, 1991. Attachment A presents the Monthly Paired Data Status Graphs, while Attachment B presents paired differences of fuel economy and quickcheck coastdown times between EPA and selected individual manufacturers. Attachment C details the methods used to prepare the graphs and summaries used for this analysis. The paired data summary statistics are presented in the Appendix.

## Conclusions

1. Overall running averages for FTP and HFET fuel economy percent differences are near zero, and running average FTP emissions offsets continue to be acceptable.

2. Ford continues to demonstrate persistent small positive (Ford measuring higher) FTP and HFET fuel economy trends. For the month of February, the average percent difference for the FTP was +1.3, with +0.7 for the HFET.

## Discussion

Combined Manufacturer's Results:

Attachment A shows acceptable overall FTP emissions running averages. February positive monthly averages for HC and CO are nearly 10 percent. While these monthly differences are somewhat greater than usual they do not exceed our limits of expected correlation.

The FTP MPG running average continues to trend near zero. The HFET MPG running average is acceptable, with the positive shift noted in last month's report returning to near zero.

Selected Manufacturers Results:

With the exception of Ford's fuel economy differences, Attachment B displays acceptable agreement for major U.S. manufacturers.

As has been noted in past reports, Ford continues to demonstrate small (about one percent) FTP and HFET positive fuel economy offsets. We expect the results from the current round of MVMA testing in about two weeks, and will contact Ford to determine the cause for this bias in paired certification results as soon as we receive this report.

Paired Data Summary Statistics:

The following data was excluded from the summary statistics calculations in the Appendix:

February Paired Data Rejected for Exceeding Screening Limits

| Mfr | Vehicle ID | VI | Parameter | Screening Limit | Test Result | EPA Value |
|---|---|---|---|---|---|---|
| Toyota | 92-UZ2 | 01 | %NOX | +100% | +102% | .099 g/mi |

Because the vehicle passed the certification standards and the fuel economy correlation was acceptable, no EPA retest was performed to confirm this difference.

If I can be of further assistance, please call on x267.

Attachments

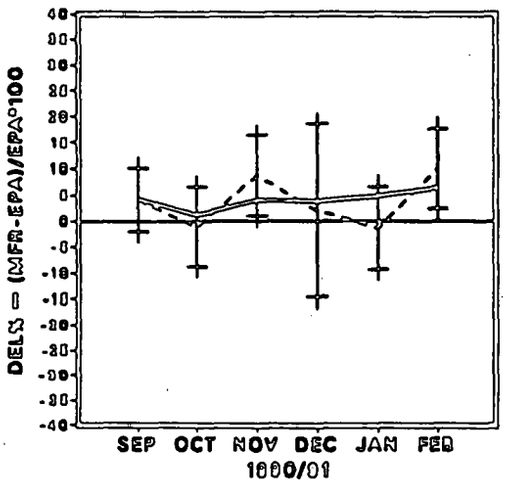
cc: R. Lawrence
J.T. White
J.D. Carpenter
P. Reece
M. Caldwell
D. Danyko
D. Perkins
R. Gilkey
T. Schrodt

# ATTACHMENT A

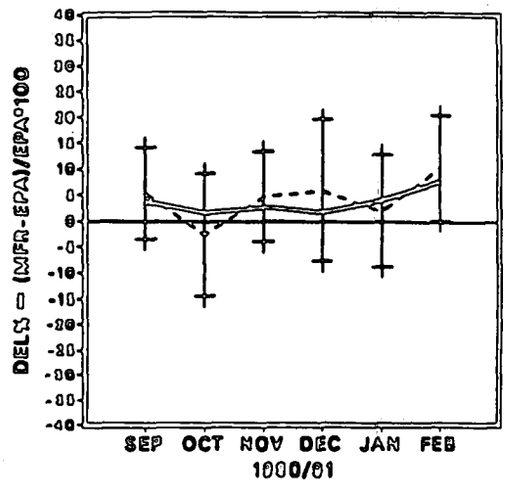
## Engineering Operations Division

## Monthly Paired Data Status Graphs

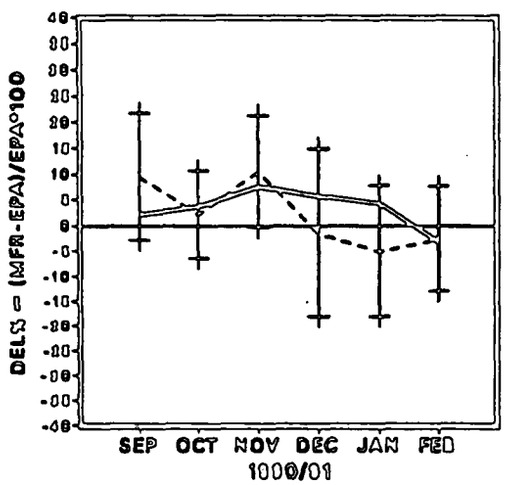
### FTP HC




### FTP CO




### FTP NOX



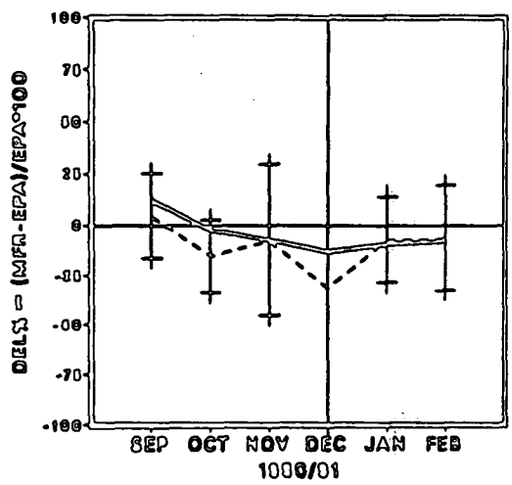

Legend

MONTHLY MEAN

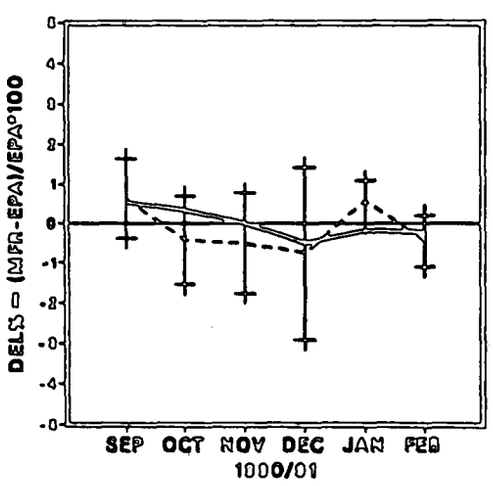
RUNNING AVERAGE

95% Confidence Interval

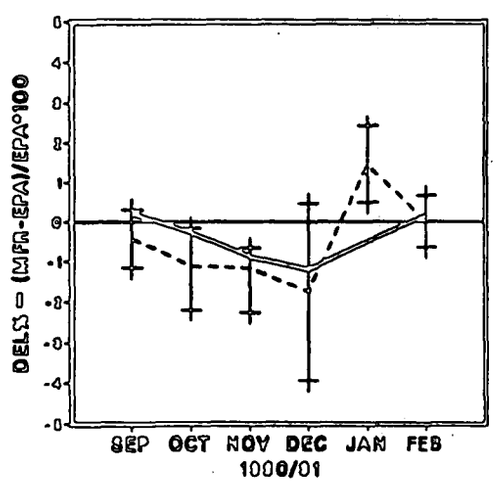
### EVAPORATIVE EMISSIONS




### FTP MPG



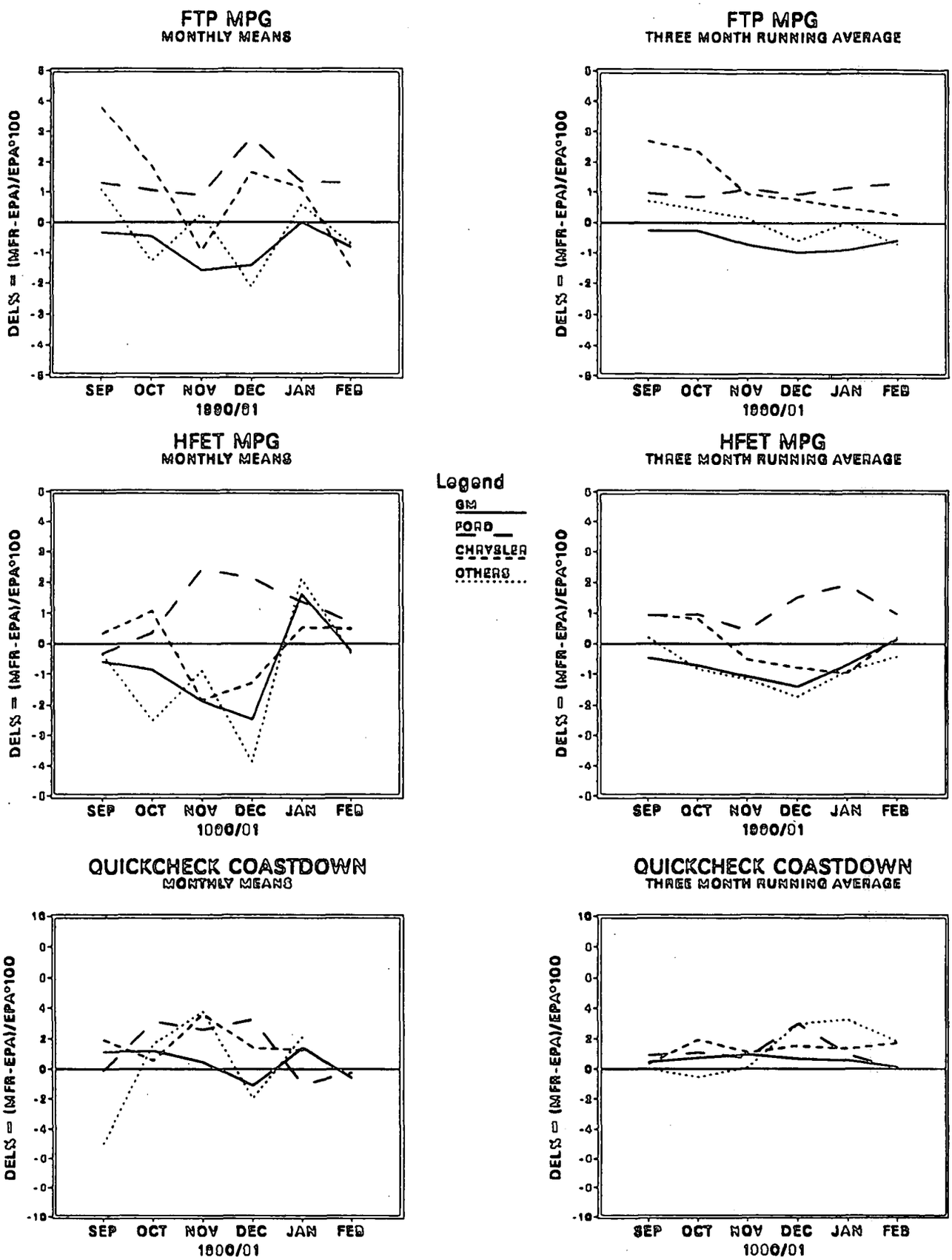

### HFET MPG



ATTACHMENT B

Engineering Operations Division

Manufacturer Paired Data Status Graphs



# ATTACHMENT C

## Engineering Operations Division
## Data Presentation Methodology

Graph Preparation:

Attachment A emission status graphs are based on an analysis of last test pairs and all confirmation strata. All emissions data has had tests removed which exceed screening limits. These limits are presented below. Fuel economy status graphs are prepared in a similar manner except that the "FE up by 1 or more" stratum has also been deleted.

Attachment B is developed using the same methodology as is used for Attachment A. It shows the monthly means and three month's running averages for individual manufacturer's fuel economy and quickcheck coastdown times. The running averages for individual months are grand averages of results from the month of interest and the two preceding months.

These graphs may change in subsequent months, as the test disposition of any individual test may change. These changes may result in tests being either included or excluded from the graphs.

Summary Statistics Preparation:

The data in the Appendix is based on an analysis of the last test pairs of all strata, and has had pairs removed which exceed the following screening limits:

### Paired Data Rejection Criteria

| | HC g/mi | CO g/mi | $CO_2$ g/mi | NOx g/mi | FE mpg | Evap g |
|---|---|---|---|---|---|---|
| **FTP** | | | | | | |
| Upper | 0.75 | 6.0 | 65.0 | 0.75 | 3.2 | |
| Lower | -0.75 | -6.0 | -65.0 | -0.75 | -3.2 | |
| **FTP (% Difference)** | | | | | | |
| Upper | 135.0 | 160.0 | 15.0 | 100.0 | 15.0 | * |
| Lower | -99.0 | -99.0 | -15.0 | -99.0 | -15.0 | * |

HFET

| | HC g/mi | CO g/mi | $CO_2$ g/mi | NOx g/mi | FE mpg | CDT sec |
|---|---|---|---|---|---|---|
| Upper | 0.2 | 6.0 | 45.0 | 1.0 | 4.5 | |
| Lower | -0.2 | -6.0 | -45.0 | -1.0 | -4.5 | |

HFET (% Difference)

| | | |
|---|---|---|
| Upper | 15.0 | 15% |
| Lower | -15.0 | -15% |

* Values to be set in revised paired data program currently under development.

0053g

# Engineering Operations Division
## Appendix

PROCESSED: 13:05:00 MAR 11, 1991

CCID: SN8Z

PROJECT: 7030

NAME: DAN

```
*************************
*                       *  TTTTT  EEEEE  SSSSS  TTTTT  SSSSS  U   U  M   M  SSSSS
*  PAIRED DATA ANALYSIS *    T    E      S        T    S      U   U  MM MM  S
*                       *    T    EEE    SSSSS    T    SSSSS  U   U  M M M  SSSSS
*   SUMMARY STATISTICS  *    T    E          S    T        S  U   U  M   M      S
*                       *    T    EEEEE  SSSSS    T    SSSSS   UUU   M   M  SSSSS
*************************
```

PERIOD OF ANALYSIS: 2- 1-91 TO 2-28-91
PAIR TYPE: EPA:MFR
MODEL YEAR(S): ALL
FUEL TYPES: NO LEAD (IND HQ), NO. 2 DIESEL
VEHICLE ADJUSTMENT: ALL VEHICLES
TEST(S) EXCLUDED: TEST PAIRS THAT ARE NOT THE LATEST FOR EACH VEHICLE

TEST TYPE(S): EMISSION DATA FUEL ECONOMY
ANALYZER(S): ALL
DYNAMOMETER(S): ALL
EVAP CLASS: EVAP AND NON EVAP
HIGH ALTITUDE: NO HIGH ALTITUDE VEHICLES INCLUDED

COMMENTS:

| | FTP GAS | FTP DIESEL | HWFE GAS | HWFE DIESEL |
|---|---|---|---|---|
| A. NUMBER OF VALID EPA PAIRS INCLUDED IN THE ANALYSIS | 44 | 0 | 43 | 0 |
| B. NUMBER OF VALID EPA PAIRS WITH EXTREME DATA EXCLUDED FROM THE ANALYSIS | 1 | 0 | 0 | 0 |
| C. NUMBER OF VALID EPA PAIRS NOT MEETING THE SELECTION CRITERIA | 3 | 0 | 4 | 0 |
| D. NUMBER OF VALID EPA TESTS WITH NO PAIRS OR NO PAIRS OF THIS PAIR TYPE | 8 | 0 | 13 | 0 |
| E. NUMBER OF VOID EPA TESTS | 7 | 0 | 1 | 0 |
| TOTAL NUMBER OF EPA TESTS IN THIS PERIOD | 63 | 0 | 61 | 0 |
| PAIRS MADE = (A+B+C) | 48 | 0 | 47 | 0 |
| POSSIBLE PAIRS = (A+B+C+D) | 56 | 0 | 60 | 0 |
| PERCENT PAIRED: ((A+B+C)/PPAIRS)*100% | 85.7 | 0.0 | 78.3 | 0.0 |
| PERCENT NOT PAIRED: (D/PPAIRS)*100% | 14.3 | 0.0 | 21.7 | 0.0 |
| | 100.0 | 0.0 | 100.0 | 0.0 |

PROCESSED: 13:05:00 MAR 11, 1991

PERIOD OF ANALYSIS: 2- 1-91 TO 2-28-91

PAIR TYPE: EPA:MFR

PAIRED DATA ANALYSIS
SUMMARY STATISTICS

FFFFF TTTTT PPPP DDDD EEEEE L
F T P P D D E L
FFF T PPPP D D EEE L
F T P D D E L
F T P DDDD EEEEE LLLLL

COMMENTS:

SIGNED DIFFERENCES: (MFR - EPA) - GASOLINE ONLY -

| | HC | | | CO | | | CO2 | | | NOX | | | MPG | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | NUM | AVG | STDEV | NUM | AVG | STDEV | NUM | AVG | STDEV | NUM | AVG | STDEV | NUM | AVG | STDEV |
| 20 CHRYS | 4 | 0.021 | 0.011 | 4 | -0.00 | 0.00 | 4 | 0.6 | 5.7 | 4 | -0.049 | 0.049 | 4 | -0.21 | 0.27 |
| 30 FORD | 7 | -0.013 | 0.021 | 7 | -0.14 | 0.20 | 7 | -4.1 | 15.2 | 7 | -0.042 | 0.076 | 7 | 0.21 | 0.47 |
| 40 GM | 12 | -0.006 | 0.032 | 12 | -0.14 | 0.70 | 12 | 7.0 | 7.3 | 12 | -0.010 | 0.150 | 12 | -0.12 | 0.25 |
| 120 DWW | 1 | -0.007 | 0.000 | 1 | -0.20 | 0.00 | 1 | 7.3 | 0.0 | 1 | 0.054 | 0.000 | 1 | -0.23 | 0.00 |
| 260 HONDA | 3 | 0.003 | 0.014 | 3 | -0.00 | 0.30 | 3 | 11.3 | 5.3 | 3 | 0.020 | 0.010 | 3 | -0.20 | 0.30 |
| 300 JDA | 1 | -0.000 | 0.000 | 1 | -0.01 | 0.00 | 1 | 1.3 | 0.0 | 1 | -0.144 | 0.000 | 1 | -0.03 | 0.00 |
| 347 LIPMT | 1 | 0.007 | 0.000 | 1 | 0.06 | 0.00 | 1 | 25.1 | 0.0 | 1 | -0.003 | 0.000 | 1 | -1.40 | 0.00 |
| 400 MITSM | 6 | 0.006 | 0.012 | 6 | 0.40 | 0.13 | 6 | 11.2 | 3.0 | 6 | -0.340 | 0.100 | 6 | -0.24 | 0.14 |
| 570 TOYOT | 7 | 0.042 | 0.031 | 7 | 0.21 | 0.20 | 7 | 3.2 | 5.1 | 7 | 0.020 | 0.045 | 7 | 0.02 | 0.47 |
| 603 METLI | 1 | -0.210 | 0.000 | 1 | -1.11 | 0.00 | 1 | -14.0 | 0.0 | 1 | 0.130 | 0.000 | 1 | 0.30 | 0.00 |
| 660 FUJI | 1 | -0.011 | 0.000 | 1 | -0.01 | 0.00 | 1 | -2.4 | 0.0 | 1 | 0.032 | 0.000 | 1 | 0.40 | 0.00 |
| ALL | 44 | 0.009 | 0.053 | 44 | -0.00 | 0.61 | 44 | 5.2 | 6.0 | 44 | -0.060 | 0.106 | 44 | -0.09 | 0.41 |

PROCESSED: 13:05:00 MAR 11, 1991

PERIOD OF ANALYSIS: 2- 1-91 TO 2-28-91

PAIR TYPE: EPA:MFR

PAIRED DATA ANALYSIS
SUMMARY STATISTICS

PPPPP TTTTT PPPP PPPP CCCC TTTTT
P T P P P P C T
PPP T PPPP PPPP C T
P T P P C T
P T P P CCCC T

COMMENTS:

PERCENT DIFFERENCES: ((MFR - EPA)/EPA) X 100% - GASOLINE ONLY -

| | HC | | | CO | | | CO2 | | | NOX | | | MPG | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | NUM | AVG | STDEV | NUM | AVG | STDEV | NUM | AVG | STDEV | NUM | AVG | STDEV | NUM | AVG | STDEV |
| 20 CHRYS | 4 | 11.6 | 6.0 | 4 | -7.0 | 6.0 | 4 | 2.01 | 1.34 | 4 | -15.3 | 23.0 | 4 | -1.04 | 1.32 |
| 30 FORD | 7 | -6.1 | 11.0 | 7 | -7.2 | 15.3 | 7 | -0.60 | 2.60 | 7 | -7.0 | 13.5 | 7 | 1.28 | 2.02 |
| 40 GM | 12 | -1.7 | 14.0 | 12 | 7.0 | 43.7 | 12 | 1.47 | 1.51 | 12 | 4.1 | 26.0 | 12 | -0.64 | 1.37 |
| 120 DWW | 1 | -4.2 | 0.0 | 1 | -10.3 | 0.0 | 1 | 1.60 | 0.00 | 1 | 71.1 | 0.0 | 1 | -1.13 | 0.00 |
| 260 HONDA | 3 | 1.6 | 7.0 | 3 | -4.2 | 10.4 | 3 | 2.04 | 1.34 | 3 | 20.4 | 10.3 | 3 | -1.30 | 1.37 |
| 300 JDA | 1 | -23.5 | 0.0 | 1 | -0.6 | 0.0 | 1 | 0.26 | 0.00 | 1 | -10.4 | 0.0 | 1 | -0.10 | 0.00 |
| 347 LIPMT | 1 | 56.9 | 0.0 | 1 | 6.7 | 0.0 | 1 | 6.66 | 0.00 | 1 | -2.1 | 0.0 | 1 | -5.97 | 0.00 |
| 400 MITSM | 6 | 37.7 | 8.6 | 6 | 40.5 | 18.3 | 6 | 2.54 | 0.69 | 6 | -55.8 | 25.8 | 6 | -1.21 | 0.70 |
| 570 TOYOT | 7 | 35.9 | 24.0 | 7 | 30.3 | 20.8 | 7 | 0.78 | 1.27 | 7 | 12.1 | 22.4 | 7 | -0.06 | 1.72 |
| 603 METLI | 1 | -44.4 | 0.0 | 1 | -43.0 | 0.0 | 1 | -2.38 | 0.00 | 1 | 51.0 | 0.0 | 1 | 2.71 | 0.00 |
| 660 FUJI | 1 | -5.9 | 0.0 | 1 | -1.1 | 0.0 | 1 | -0.62 | 0.00 | 1 | 36.4 | 0.0 | 1 | 2.10 | 0.00 |
| ALL | 44 | 10.1 | 25.2 | 44 | 10.4 | 33.2 | 44 | 1.28 | 2.06 | 44 | -2.7 | 33.7 | 44 | -0.38 | 2.01 |

PROCESSED: 13:05:02 MAR 11, 1991

PERIOD OF ANALYSIS: 2- 1-91 TO 2-28-91

PAIR TYPE: EPA:MFR

PAIRED DATA ANALYSIS

SUMMARY STATISTICS

COMMENTS:

SIGNED DIFFERENCES: (MFR - EPA) - GASOLINE ONLY -

| | HC | | | CO | | | CO2 | | | NOX | | | MPG | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | NUM | AVG | STDEV | NUM | AVG | STDEV | NUM | AVG | STDEV | NUM | AVG | STDEV | NUM | AVG | STDEV |
| 20 CHRYS | 3 | 0.015 | 0.005 | 3 | 0.18 | 0.02 | 3 | 0.8 | 2.4 | 3 | -0.062 | 0.046 | 3 | 0.15 | 0.26 |
| 30 FORD | 7 | -0.007 | 0.012 | 7 | -0.01 | 0.09 | 7 | -0.8 | 2.7 | 7 | -0.300 | 0.460 | 7 | 0.17 | 0.23 |
| 40 GM | 11 | -0.004 | 0.010 | 11 | 0.04 | 0.08 | 11 | 2.5 | 5.9 | 11 | -0.093 | 0.185 | 11 | -0.03 | 0.70 |
| 120 BMW | 1 | -0.005 | 0.000 | 1 | 0.02 | 0.00 | 1 | 12.5 | 0.0 | 1 | 0.020 | 0.000 | 1 | -1.39 | 0.00 |
| 260 HONDA | 3 | 0.001 | 0.004 | 3 | 0.04 | 0.04 | 3 | 0.5 | 0.5 | 3 | -0.046 | 0.030 | 3 | -0.60 | 0.14 |
| 300 JGA | 1 | 0.101 | 0.000 | 1 | 0.43 | 0.00 | 1 | 3.2 | 0.0 | 1 | 0.073 | 0.000 | 1 | 0.00 | 0.00 |
| 347 LIPHT | 1 | 0.073 | 0.000 | 1 | 0.22 | 0.00 | 1 | 0.6 | 0.0 | 1 | -0.005 | 0.000 | 1 | -0.93 | 0.00 |
| 490 MITSH | 6 | 0.017 | 0.006 | 6 | 0.09 | 0.10 | 6 | -0.2 | 0.8 | 6 | -0.570 | 0.263 | 6 | 0.44 | 0.06 |
| 570 TOYOT | 8 | 0.006 | 0.012 | 8 | 0.00 | 0.02 | 8 | -1.2 | 5.4 | 8 | 0.002 | 0.050 | 8 | 0.47 | 0.61 |
| 603 WETLI | 1 | 0.006 | 0.000 | 1 | -0.39 | 0.00 | 1 | -0.9 | 0.0 | 1 | 0.010 | 0.000 | 1 | 0.05 | 0.00 |
| 660 FUJI | 1 | -0.046 | 0.000 | 1 | -0.19 | 0.00 | 1 | 4.6 | 0.0 | 1 | 0.002 | 0.000 | 1 | 0.06 | 0.00 |
| ALL | 43 | 0.005 | 0.024 | 43 | 0.04 | 0.13 | 43 | 1.5 | 5.0 | 43 | -0.171 | 0.303 | 43 | 0.09 | 0.59 |

PROCESSED: 13:05:02 MAR 11, 1991

PERIOD OF ANALYSIS: 2- 1-91 TO 2-28-91

PAIR TYPE: EPA:MFR

PAIRED DATA ANALYSIS

SUMMARY STATISTICS

COMMENTS:

PERCENT DIFFERENCES: ((MFR - EPA)/EPA) X 100% - GASOLINE ONLY -

| | HC | | | CO | | | CO2 | | | NOX | | | MPG | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | NUM | AVG | STDEV | NUM | AVG | STDEV | NUM | AVG | STDEV | NUM | AVG | STDEV | NUM | AVG | STDEV |
| 20 CHRYS | 3 | 25.5 | 12.2 | 3 | 91.9 | 65.7 | 3 | 0.28 | 0.85 | 3 | -38.4 | 3.5 | 3 | 0.48 | 0.83 |
| 30 FORD | 7 | -8.0 | 29.5 | 7 | 8.9 | 136.0 | 7 | -0.19 | 0.79 | 7 | -31.4 | 38.7 | 7 | 0.69 | 0.86 |
| 40 GM | 11 | -4.3 | 39.9 | 11 | 234.6 | 329.4 | 11 | 0.93 | 2.20 | 11 | -16.3 | 28.7 | 11 | -0.01 | 2.08 |
| 120 BMW | 1 | -31.3 | 0.0 | 1 | 40.0 | 0.0 | 1 | 4.73 | 0.00 | 1 | 200.0 | 0.0 | 1 | -4.16 | 0.00 |
| 260 HONDA | 3 | 4.0 | 7.4 | 3 | 55.0 | 74.7 | 3 | 3.15 | 0.22 | 3 | -59.1 | 3.9 | 3 | -1.81 | 0.37 |
| 300 JGA | 1 | 102.0 | 0.0 | 1 | 113.2 | 0.0 | 1 | 0.84 | 0.00 | 1 | 37.1 | 0.0 | 1 | 0.00 | 0.00 |
| 347 LIPHT | 1 | 197.3 | 0.0 | 1 | 550.0 | 0.0 | 1 | 3.23 | 0.00 | 1 | -55.6 | 0.0 | 1 | -2.81 | 0.00 |
| 490 MITSH | 6 | 126.9 | 52.6 | 6 | 450.0 | 493.0 | 6 | -0.06 | 0.29 | 6 | -83.4 | 21.2 | 6 | 1.46 | 0.20 |
| 570 TOYOT | 8 | 43.4 | 61.4 | 8 | 107.8 | 320.7 | 8 | -0.35 | 1.83 | 8 | 30.2 | 54.3 | 8 | 1.33 | 1.85 |
| 603 WETLI | 1 | 3.3 | 0.0 | 1 | -22.7 | 0.0 | 1 | -0.18 | 0.00 | 1 | 12.4 | 0.0 | 1 | 0.29 | 0.00 |
| 660 FUJI | 1 | -40.3 | 0.0 | 1 | -47.5 | 0.0 | 1 | 1.76 | 0.00 | 1 | 11.1 | 0.0 | 1 | 0.18 | 0.00 |
| ALL | 43 | 30.8 | 66.8 | 43 | 169.3 | 315.7 | 43 | 0.61 | 1.82 | 43 | -17.3 | 58.7 | 43 | 0.32 | 1.79 |

PROCESSED: 13:05:01 MAR 11, 1991

PERIOD OF ANALYSIS: 2- 1-91 TO 2-28-91

PAIR TYPE: EPA:MFR

PAIRED DATA ANALYSIS

SUMMARY STATISTICS

COMMENTS:

DATA AND DIFFERENCES:

| | EPA GM/TEST | | | (M-E) DIURNAL | | | (M-E) H.SOAK | | | (M-E) TOTAL | | | (M-E)/E % DIFF | | | EPA SOAK | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | NUM | AVG | STDEV | NUM | AVG | STDEV | NUM | AVG | STDEV | NUM | AVG | STDEV | NUM | AVG | STDEV | NUM | AVG | STDEV |
| 20 CHRYS | 3 | 0.55 | 0.26 | 3 | -0.36 | 0.20 | 3 | 0.01 | 0.02 | 3 | -0.34 | 0.31 | 3 | -55.3 | 28.0 | 3 | 16.3 | 1.6 |
| 30 FORD | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.0 | 0.0 | 0 | 0.0 | 0.0 |
| 40 GM | 5 | 0.55 | 0.27 | 5 | -0.09 | 0.27 | 5 | 0.01 | 0.03 | 5 | -0.08 | 0.29 | 5 | 2.6 | 57.7 | 5 | 16.4 | 1.1 |
| 120 BMW | 1 | 0.98 | 0.00 | 1 | 0.00 | 0.00 | 1 | 0.02 | 0.00 | 1 | 0.02 | 0.00 | 1 | 2.0 | 0.0 | 1 | 16.0 | 0.0 |
| 260 HONDA | 1 | 0.76 | 0.00 | 1 | -0.34 | 0.00 | 1 | 0.07 | 0.00 | 1 | -0.27 | 0.00 | 1 | -35.5 | 0.0 | 1 | 16.0 | 0.0 |
| 308 JBA | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.0 | 0.0 | 0 | 0.0 | 0.0 |
| 347 LIPHT | 1 | 1.10 | 0.00 | 1 | -0.02 | 0.00 | 1 | 0.21 | 0.00 | 1 | 0.19 | 0.00 | 1 | 17.3 | 0.0 | 1 | 16.0 | 0.0 |
| 490 MITSH | 1 | 0.64 | 0.00 | 1 | 0.03 | 0.00 | 1 | 0.03 | 0.00 | 1 | 0.06 | 0.00 | 1 | 9.4 | 0.0 | 1 | 17.0 | 0.0 |
| 570 TOYOT | 3 | 0.33 | 0.03 | 3 | -0.03 | 0.05 | 3 | 0.08 | 0.11 | 3 | 0.05 | 0.15 | 3 | 16.7 | 47.9 | 3 | 16.0 | 0.0 |
| 603 WETLI | 1 | 0.54 | 0.00 | 1 | 0.13 | 0.00 | 1 | -0.08 | 0.00 | 1 | 0.05 | 0.00 | 1 | 9.3 | 0.0 | 1 | 19.0 | 0.0 |
| 660 FUJI | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.0 | 0.0 | 0 | 0.0 | 0.0 |
| ALL | 16 | 0.59 | 0.27 | 16 | -0.11 | 0.23 | 16 | 0.04 | 0.07 | 16 | -0.08 | 0.26 | 16 | -6.3 | 45.2 | 16 | 16.4 | 1.1 |
| BY SHED: (EPA TESTS) | | | | | | | | | | | | | | | | | | |
| S001 | 10 | 0.59 | 0.23 | 10 | -0.18 | 0.26 | 10 | 0.03 | 0.07 | 10 | -0.15 | 0.27 | 10 | -14.9 | 42.8 | 10 | 16.5 | 1.3 |
| S002 | 4 | 0.53 | 0.30 | 4 | -0.07 | 0.11 | 4 | 0.01 | 0.02 | 4 | -0.06 | 0.12 | 4 | -15.5 | 28.6 | 4 | 16.5 | 1.0 |
| S003 | 2 | 0.72 | 0.54 | 2 | 0.11 | 0.10 | 2 | 0.14 | 0.10 | 2 | 0.25 | 0.08 | 2 | 56.6 | 54.2 | 2 | 16.0 | 0.0 |
| S004 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.0 | 0.0 | 0 | 0.0 | 0.0 |
| ALL | 16 | 0.59 | 0.27 | 16 | -0.11 | 0.23 | 16 | 0.04 | 0.07 | 16 | -0.08 | 0.26 | 16 | -6.3 | 45.2 | 16 | 16.4 | 1.1 |

PROCESSED: 13:05:02 MAR 11, 1991

PERIOD OF ANALYSIS: 2- 1-91 TO 2-28-91

PAIR TYPE: EPA:MFR

PAIRED DATA ANALYSIS

SUMMARY STATISTICS

COMMENTS:

COASTDOWN DATA: - GASOLINE TESTS -

| | MFR TRK | | | MFR QCHK | | | EPA QCHK | | | (MFR-EPA) | | | ((M-E)/E)% | | | VFHP (M-E) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | NUM | AVG | STDEV | NUM | AVG | STDEV | NUM | AVG | STDEV | NUM | AVG | STDEV | NUM | AVG | STDEV | NUM | AVG | STDEV |
| 20 CHRYS | 3 | 16.73 | 0.73 | 3 | 16.33 | 0.61 | 3 | 16.13 | 0.67 | 3 | 0.20 | 0.10 | 3 | 1.25 | 0.66 | 3 | -0.17 | 0.08 |
| 30 FORD | 7 | 14.71 | 1.37 | 7 | 14.31 | 1.32 | 7 | 14.34 | 1.32 | 7 | -0.03 | 0.05 | 7 | -0.23 | 0.38 | 7 | 0.05 | 0.08 |
| 40 GM | 11 | 15.72 | 1.91 | 11 | 15.61 | 1.83 | 11 | 15.67 | 1.76 | 11 | -0.06 | 0.33 | 11 | -0.41 | 2.07 | 11 | 0.05 | 0.29 |
| 120 BMW | 1 | 17.00 | 0.00 | 1 | 15.53 | 0.00 | 1 | 15.79 | 0.00 | 1 | -0.26 | 0.00 | 1 | -1.65 | 0.00 | 1 | 0.22 | 0.00 |
| 260 HONDA | 3 | 15.11 | 0.02 | 3 | 15.61 | 0.06 | 3 | 14.93 | 0.22 | 3 | 0.68 | 0.19 | 3 | 4.57 | 1.33 | 3 | -0.63 | 0.17 |
| 308 JBA | 1 | 0.00 | 0.00 | 1 | 0.00 | 0.00 | 1 | 0.00 | 0.00 | 1 | 0.00 | 0.00 | 1 | 0.00 | 0.00 | 1 | 0.00 | 0.00 |
| 347 LIPHT | 1 | 15.86 | 0.00 | 1 | 13.04 | 0.00 | 1 | 14.62 | 0.00 | 1 | -1.58 | 0.00 | 1 | -10.81 | 0.00 | 1 | 1.64 | 0.00 |
| 490 MITSH | 6 | 16.49 | 0.45 | 6 | 16.40 | 0.35 | 6 | 15.82 | 0.29 | 6 | 0.58 | 0.50 | 6 | 3.70 | 3.24 | 6 | -0.54 | 0.47 |
| 570 TOYOT | 8 | 14.75 | 1.43 | 8 | 14.20 | 1.27 | 8 | 14.03 | 1.54 | 8 | 0.17 | 0.35 | 8 | 1.42 | 2.62 | 8 | -0.16 | 0.35 |
| 603 WETLI | 1 | 0.00 | 0.00 | 1 | 0.00 | 0.00 | 1 | 0.00 | 0.00 | 1 | 0.00 | 0.00 | 1 | 0.00 | 0.00 | 1 | 0.00 | 0.00 |
| 660 FUJI | 1 | 14.71 | 0.00 | 1 | 14.69 | 0.00 | 1 | 14.59 | 0.00 | 1 | 0.10 | 0.00 | 1 | 0.69 | 0.00 | 1 | -0.10 | 0.00 |
| ALL | 43 | 14.79 | 3.61 | 43 | 14.49 | 3.55 | 43 | 14.38 | 3.51 | 43 | 0.11 | 0.47 | 43 | 0.77 | 3.13 | 43 | -0.10 | 0.45 |

PROCESSED: 13:05:01 MAR 11, 1991

PERIOD OF ANALYSIS: 2- 1-91 TO 2-28-91

PAIR TYPE: EPA:MFR

PAIRED DATA ANALYSIS

SUMMARY STATISTICS

DDDD EEEEE L SSSSS III TTTTT EEEEE
D D E L S I T E
D D EEE L SSSSS I T EEE
D D E L S I T E
DDDD EEEEE LLLLL SSSSS III T EEEEE

COMMENTS:

SIGNED DIFFERENCES: ( MFR - EPA ) - ALL FUELS -

| TP | SITE | HC | | | CO | | | CO2 | | | NOX | | | MPG | | | COUNT BY MFR GROUP | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | NUM | AVG | STDEV | NUM | AVG | STDEV | NUM | AVG | STDEV | NUM | AVG | STDEV | NUM | AVG | STDEV | AMC | CHR | FRD | GM | OTHR |
| FTP | | | | | | | | | | | | | | | | | | | | | |
| | D001 | 16 | 0.002 | 0.073 | 16 | -0.06 | 0.49 | 16 | 4.67 | 7.88 | 16 | -0.026 | 0.158 | 16 | -0.07 | 0.29 | 0 | 2 | 0 | 4 | 10 |
| | D002 | 12 | 0.007 | 0.044 | 12 | 0.14 | 0.39 | 12 | 4.52 | 6.06 | 12 | -0.118 | 0.208 | 12 | -0.01 | 0.42 | 0 | 2 | 3 | 2 | 5 |
| | D003 | 1 | -0.034 | 0.000 | 1 | -1.10 | 0.00 | 1 | 18.90 | 0.00 | 1 | 0.043 | 0.000 | 1 | -0.55 | 0.00 | 0 | 0 | 0 | 1 | 0 |
| | D004 | 2 | -0.009 | 0.003 | 2 | -0.10 | 0.13 | 2 | 2.45 | 6.86 | 2 | 0.043 | 0.016 | 2 | 0.13 | 0.50 | 0 | 0 | 0 | 0 | 2 |
| | D005 | 8 | 0.035 | 0.020 | 8 | 0.30 | 0.38 | 8 | 9.31 | 9.45 | 8 | -0.047 | 0.147 | 8 | -0.27 | 0.50 | 0 | 0 | 2 | 3 | 3 |
| | D006 | 5 | 0.009 | 0.035 | 5 | -0.38 | 0.61 | 5 | 0.52 | 21.07 | 5 | -0.075 | 0.136 | 5 | -0.00 | 0.57 | 0 | 0 | 2 | 2 | 1 |
| | D007 | 0 | 0.000 | 0.000 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.000 | 0.000 | 0 | 0.00 | 0.00 | 0 | 0 | 0 | 0 | 0 |
| | ALL | 44 | 0.009 | 0.053 | 44 | -0.00 | 0.51 | 44 | 5.22 | 9.93 | 44 | -0.056 | 0.165 | 44 | -0.09 | 0.41 | 0 | 4 | 7 | 12 | 21 |
| | A001 | 28 | 0.004 | 0.061 | 28 | 0.03 | 0.46 | 28 | 4.61 | 7.03 | 28 | -0.065 | 0.183 | 28 | -0.04 | 0.34 | 0 | 4 | 3 | 6 | 15 |
| | A002 | 3 | -0.017 | 0.015 | 3 | -0.47 | 0.63 | 3 | 7.93 | 10.66 | 3 | 0.043 | 0.011 | 3 | -0.10 | 0.53 | 0 | 0 | 0 | 1 | 2 |
| | A003 | 13 | 0.025 | 0.032 | 13 | 0.04 | 0.57 | 13 | 5.93 | 14.83 | 13 | -0.058 | 0.137 | 13 | -0.17 | 0.52 | 0 | 0 | 4 | 5 | 4 |
| | A004 | 0 | 0.000 | 0.000 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.000 | 0.000 | 0 | 0.00 | 0.00 | 0 | 0 | 0 | 0 | 0 |
| | ALL | 44 | 0.009 | 0.053 | 44 | -0.00 | 0.51 | 44 | 5.22 | 9.93 | 44 | -0.056 | 0.165 | 44 | -0.09 | 0.41 | 0 | 4 | 7 | 12 | 21 |
| HWFE | | | | | | | | | | | | | | | | | | | | | |
| | D001 | 15 | 0.016 | 0.025 | 15 | 0.06 | 0.17 | 15 | -1.71 | 4.64 | 15 | -0.107 | 0.230 | 15 | 0.47 | 0.50 | 0 | 2 | 0 | 4 | 9 |
| | D002 | 10 | -0.003 | 0.020 | 10 | 0.03 | 0.11 | 10 | 2.00 | 3.23 | 10 | -0.335 | 0.447 | 10 | 0.07 | 0.38 | 0 | 1 | 3 | 1 | 5 |
| | D003 | 0 | 0.000 | 0.000 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.000 | 0.000 | 0 | 0.00 | 0.00 | 0 | 0 | 0 | 0 | 0 |
| | D004 | 1 | -0.048 | 0.000 | 1 | -0.19 | 0.00 | 1 | 4.50 | 0.00 | 1 | 0.002 | 0.000 | 1 | 0.06 | 0.00 | 0 | 0 | 0 | 0 | 1 |
| | D005 | 10 | 0.007 | 0.026 | 10 | 0.06 | 0.11 | 10 | 2.62 | 4.92 | 10 | -0.130 | 0.261 | 10 | -0.07 | 0.50 | 0 | 0 | 3 | 2 | 5 |
| | D006 | 7 | 0.000 | 0.012 | 7 | 0.02 | 0.07 | 7 | 5.90 | 4.89 | 7 | -0.158 | 0.234 | 7 | -0.48 | 0.71 | 0 | 0 | 1 | 4 | 2 |
| | D007 | 0 | 0.000 | 0.000 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.000 | 0.000 | 0 | 0.00 | 0.00 | 0 | 0 | 0 | 0 | 0 |
| | ALL | 43 | 0.005 | 0.024 | 43 | 0.04 | 0.13 | 43 | 1.54 | 5.05 | 43 | -0.171 | 0.303 | 43 | 0.09 | 0.59 | 0 | 3 | 7 | 11 | 22 |
| | A001 | 25 | 0.008 | 0.025 | 25 | 0.05 | 0.14 | 25 | -0.22 | 4.46 | 25 | -0.198 | 0.345 | 25 | 0.31 | 0.49 | 0 | 3 | 3 | 5 | 14 |
| | A002 | 1 | -0.048 | 0.000 | 1 | -0.19 | 0.00 | 1 | 4.50 | 0.00 | 1 | 0.002 | 0.000 | 1 | 0.06 | 0.00 | 0 | 0 | 0 | 0 | 1 |
| | A003 | 17 | 0.004 | 0.021 | 17 | 0.04 | 0.09 | 17 | 3.97 | 5.04 | 17 | -0.141 | 0.243 | 17 | -0.24 | 0.61 | 0 | 0 | 4 | 6 | 7 |
| | A004 | 0 | 0.000 | 0.000 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.000 | 0.000 | 0 | 0.00 | 0.00 | 0 | 0 | 0 | 0 | 0 |
| | ALL | 43 | 0.005 | 0.024 | 43 | 0.04 | 0.13 | 43 | 1.54 | 5.05 | 43 | -0.171 | 0.303 | 43 | 0.09 | 0.59 | 0 | 3 | 7 | 11 | 22 |

PROCESSED: 13:05:01 MAR 11, 1991

PERIOD OF ANALYSIS: 2- 1-91 TO 2-28-91

PAIR TYPE: EPA:MFR

PAIRED DATA ANALYSIS

SUMMARY STATISTICS

PPPP CCCC TTTTT SSSSS III TTTTT EEEEE
P P C T S I T E
PPPP C T SSSSS I T EEE
P C T S I T E
P CCCC T SSSSS III T EEEEE

COMMENTS:

PERCENT DIFFERENCES: ((MFR - EPA)/EPA) X 100% - ALL FUELS -

| TP | SITE | HC | | | CO | | | CO2 | | | NOX | | | MPG | | | COUNT BY MFR GROUP | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | NUM | AVG | STDEV | NUM | AVG | STDEV | NUM | AVG | STDEV | NUM | AVG | STDEV | NUM | AVG | STDEV | AMC | CHR | FRD | GM | OTHR |
| FTP | | | | | | | | | | | | | | | | | | | | | |
| | D001 | 16 | 11.8 | 31.5 | 16 | 8.5 | 26.8 | 16 | 1.19 | 1.69 | 16 | 3.3 | 37.5 | 16 | -0.28 | 1.47 | 0 | 2 | 0 | 4 | 10 |
| | D002 | 12 | 7.1 | 21.8 | 12 | 15.7 | 31.2 | 12 | 0.98 | 1.52 | 12 | -15.4 | 31.9 | 12 | -0.18 | 1.64 | 0 | 2 | 3 | 2 | 5 |
| | D003 | 1 | -21.4 | 0.0 | 1 | -50.0 | 0.0 | 1 | 4.14 | 0.00 | 1 | 11.4 | 0.0 | 1 | -2.86 | 0.00 | 0 | 0 | 0 | 1 | 0 |
| | D004 | 2 | -5.0 | 1.2 | 2 | -0.7 | 10.7 | 2 | 0.53 | 1.63 | 2 | 53.7 | 24.5 | 2 | 0.49 | 2.29 | 0 | 0 | 0 | 0 | 2 |
| | D005 | 8 | 21.9 | 17.9 | 8 | 30.7 | 43.2 | 8 | 2.15 | 2.34 | 8 | -9.6 | 26.3 | 8 | -1.26 | 2.23 | 0 | 0 | 2 | 3 | 3 |
| | D006 | 5 | 5.6 | 23.0 | 5 | -7.8 | 23.3 | 5 | 0.60 | 3.71 | 5 | -5.4 | 19.6 | 5 | 0.36 | 3.72 | 0 | 0 | 2 | 2 | 1 |
| | D007 | 0 | 0.0 | 0.0 | 0 | 0.0 | 0.0 | 0 | 0.00 | 0.00 | 0 | 0.0 | 0.0 | 0 | 0.00 | 0.00 | 0 | 0 | 0 | 0 | 0 |
| | ALL | 44 | 10.1 | 25.2 | 44 | 10.4 | 33.2 | 44 | 1.28 | 2.06 | 44 | -2.7 | 33.7 | 44 | -0.38 | 2.01 | 0 | 4 | 7 | 12 | 21 |
| | A001 | 28 | 9.8 | 27.4 | 28 | 11.6 | 28.5 | 28 | 1.10 | 1.59 | 28 | -4.7 | 35.8 | 28 | -0.24 | 1.52 | 0 | 4 | 3 | 6 | 15 |
| | A002 | 3 | -10.5 | 9.5 | 3 | -24.8 | 28.9 | 3 | 1.74 | 2.38 | 3 | 39.6 | 30.0 | 3 | -0.63 | 2.52 | 0 | 0 | 0 | 1 | 2 |
| | A003 | 13 | 15.6 | 20.8 | 13 | 15.9 | 40.6 | 13 | 1.56 | 2.89 | 13 | -8.0 | 23.1 | 13 | -0.64 | 2.86 | 0 | 0 | 4 | 5 | 4 |
| | A004 | 0 | 0.0 | 0.0 | 0 | 0.0 | 0.0 | 0 | 0.00 | 0.00 | 0 | 0.0 | 0.0 | 0 | 0.00 | 0.00 | 0 | 0 | 0 | 0 | 0 |
| | ALL | 44 | 10.1 | 25.2 | 44 | 10.4 | 33.2 | 44 | 1.28 | 2.06 | 44 | -2.7 | 33.7 | 44 | -0.38 | 2.01 | 0 | 4 | 7 | 12 | 21 |
| HWFE | | | | | | | | | | | | | | | | | | | | | |
| | D001 | 15 | 54.3 | 64.2 | 15 | 116.4 | 230.4 | 15 | -0.57 | 1.57 | 15 | -16.0 | 47.3 | 15 | 1.48 | 1.53 | 0 | 2 | 0 | 4 | 9 |
| | D002 | 10 | 8.4 | 53.6 | 10 | 122.4 | 290.6 | 10 | 0.78 | 1.17 | 10 | -38.1 | 53.0 | 10 | 0.22 | 1.20 | 0 | 1 | 3 | 1 | 5 |
| | D003 | 0 | 0.0 | 0.0 | 0 | 0.0 | 0.0 | 0 | 0.00 | 0.00 | 0 | 0.0 | 0.0 | 0 | 0.00 | 0.00 | 0 | 0 | 0 | 0 | 0 |
| | D004 | 1 | -40.3 | 0.0 | 1 | -47.5 | 0.0 | 1 | 1.76 | 0.00 | 1 | 11.1 | 0.0 | 1 | 0.18 | 0.00 | 0 | 0 | 0 | 0 | 1 |
| | D005 | 10 | 45.1 | 80.6 | 10 | 263.9 | 394.1 | 10 | 1.01 | 1.67 | 10 | -18.3 | 59.6 | 10 | -0.14 | 1.63 | 0 | 0 | 3 | 2 | 5 |
| | D006 | 7 | 2.2 | 56.3 | 7 | 245.4 | 417.3 | 7 | 2.20 | 2.04 | 7 | 6.8 | 88.5 | 7 | -1.37 | 1.96 | 0 | 0 | 1 | 4 | 2 |
| | D007 | 0 | 0.0 | 0.0 | 0 | 0.0 | 0.0 | 0 | 0.00 | 0.00 | 0 | 0.0 | 0.0 | 0 | 0.00 | 0.00 | 0 | 0 | 0 | 0 | 0 |
| | ALL | 43 | 30.8 | 66.8 | 43 | 169.3 | 315.7 | 43 | 0.61 | 1.82 | 43 | -17.3 | 58.7 | 43 | 0.32 | 1.79 | 0 | 3 | 7 | 11 | 22 |
| | A001 | 25 | 35.9 | 63.3 | 25 | 118.8 | 250.3 | 25 | -0.03 | 1.55 | 25 | -24.9 | 49.8 | 25 | 0.98 | 1.51 | 0 | 3 | 3 | 5 | 14 |
| | A002 | 1 | -40.3 | 0.0 | 1 | -47.5 | 0.0 | 1 | 1.76 | 0.00 | 1 | 11.1 | 0.0 | 1 | 0.18 | 0.00 | 0 | 0 | 0 | 0 | 1 |
| | A003 | 17 | 27.5 | 72.9 | 17 | 256.3 | 390.8 | 17 | 1.50 | 1.87 | 17 | -7.9 | 71.4 | 17 | -0.65 | 1.83 | 0 | 0 | 4 | 6 | 7 |
| | A004 | 0 | 0.0 | 0.0 | 0 | 0.0 | 0.0 | 0 | 0.00 | 0.00 | 0 | 0.0 | 0.0 | 0 | 0.00 | 0.00 | 0 | 0 | 0 | 0 | 0 |
| | ALL | 43 | 30.8 | 66.8 | 43 | 169.3 | 315.7 | 43 | 0.61 | 1.82 | 43 | -17.3 | 58.7 | 43 | 0.32 | 1.79 | 0 | 3 | 7 | 11 | 22 |

PROCESSED: 13:05:01 MAR 11, 1991

PERIOD OF ANALYSIS: 2- 1-91 TO 2-28-91

PAIR TYPE: EPA:MFR

PAIRED DATA ANALYSIS

SUMMARY STATISTICS

COMMENTS:
PERCENT DIFFERENCE: ((MFR - EPA)/EPA) X 100 %  - GASOLINE ONLY -

MPG PERCENT DIFFERENCE BY REASON FOR CONFIRMATION CODE

| | RANDOM AUDIT | | | FAILURE AT MFR | | | FE UP BY 1 OR MORE | | | NEW VEHICLE | | | FE CORR OFFSET | | | ALL OTHERS | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | NUM | AVG | STDEV | NUM | AVG | STDEV | NUM | AVG | STDEV | NUM | AVG | STDEV | NUM | AVG | STDEV | NUM | AVG | STDEV |
| 20 CHRYS | 2 | -1.15 | 1.41 | 0 | 0.00 | 0.00 | 1 | 0.34 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 1 | -2.10 | 0.00 |
| 30 FORD | 4 | 1.96 | 3.44 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 3 | 0.30 | 2.00 |
| 40 GM | 3 | 0.66 | 0.77 | 1 | -2.00 | 0.00 | 1 | 1.30 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 7 | -1.10 | 0.70 |
| 120 BMW | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 1 | -1.13 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 |
| 260 HONDA | 1 | -1.56 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 2 | -1.17 | 1.01 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 |
| 300 JGA | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 1 | -0.10 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 |
| 347 LIPHT | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 1 | -5.07 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 |
| 490 MITSH | 3 | -1.45 | 0.55 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 3 | -0.90 | 0.07 |
| 570 TOYOT | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 4 | 0.50 | 1.02 | 0 | 0.00 | 0.00 | 3 | -0.01 | 1.36 |
| 603 WETLI | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 1 | 2.71 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 |
| 660 FUJI | 1 | 2.10 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 |
| ALL | 14 | 0.27 | 2.33 | 1 | -2.06 | 0.00 | 2 | 0.02 | 0.60 | 10 | -0.40 | 2.60 | 0 | 0.00 | 0.00 | 17 | -0.85 | 1.22 |

PROCESSED: 13:05:02 MAR 11, 1991

PERIOD OF ANALYSIS: 2- 1-91 TO 2-28-91

PAIR TYPE: EPA:MFR

PAIRED DATA ANALYSIS

SUMMARY STATISTICS

COMMENTS:
PERCENT DIFFERENCE: ((MFR - EPA)/EPA) X 100 %  - GASOLINE ONLY -

MPG PERCENT DIFFERENCE BY REASON FOR CONFIRMATION CODE

| | RANDOM AUDIT | | | FAILURE AT MFR | | | FE UP BY 1 OR MORE | | | NEW VEHICLE | | | FE CORR OFFSET | | | ALL OTHERS | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | NUM | AVG | STDEV | NUM | AVG | STDEV | NUM | AVG | STDEV | NUM | AVG | STDEV | NUM | AVG | STDEV | NUM | AVG | STDEV |
| 20 CHRYS | 2 | 0.14 | 0.03 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 1 | 1.10 | 0.00 |
| 30 FORD | 5 | 0.50 | 1.01 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 2 | 0.90 | 0.24 |
| 40 GM | 3 | 0.60 | 1.96 | 0 | 0.00 | 0.00 | 1 | 2.43 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 7 | -0.65 | 2.05 |
| 120 BMW | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 1 | -4.10 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 |
| 260 HONDA | 1 | -1.42 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 2 | -2.00 | 0.21 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 |
| 300 JGA | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 1 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 |
| 347 LIPHT | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 1 | -2.01 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 |
| 490 MITSH | 3 | 1.39 | 0.21 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 3 | 1.53 | 0.21 |
| 570 TOYOT | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 4 | 1.45 | 1.44 | 0 | 0.00 | 0.00 | 4 | 1.21 | 2.43 |
| 603 WETLI | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 1 | 0.20 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 |
| 660 FUJI | 1 | 0.18 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 |
| ALL | 15 | 0.54 | 1.17 | 0 | 0.00 | 0.00 | 1 | 2.43 | 0.00 | 10 | -0.49 | 2.25 | 0 | 0.00 | 0.00 | 17 | 0.47 | 1.91 |

MER

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

ANN ARBOR, MICHIGAN 48105

March 26, 1991

OFFICE OF
AIR AND RADIATION

MEMORANDUM

SUBJECT: Monthly Paired Data - January, 1991

FROM: Daniel C. Stokes, Mechanical Engineering Technician
Correlation and Engineering Services

Daniel C. Stokes

TO: Eldert Bontekoe, Team Leader
Certification Branch

THRU: Martin E. Reineman, Manager MER
Correlation and Engineering Services

This report presents the paired data for January, 1991. Attachment A presents the Monthly Paired Data Status Graphs, while Attachment B presents paired differences of fuel economy and quickcheck coastdown times between EPA and selected individual manufacturers. Attachment C details the methods used to prepare the graphs and summaries used for this analysis. The paired data summary statistics are presented in the Appendix.

Conclusions:

1. HFET fuel economy for January shifted upward noticeably, with all manufacturers' showing positive averages. FTP fuel economy averages were also positive, but to a lesser degree.

2. Ford continues to demonstrate persistent positive (Ford measuring higher) FTP and HFET fuel economy trends. Ford will be contacted to discuss our observations.

Discussion:

Combined Manufacturer's Results:

Attachment A shows acceptable overall FTP emissions running averages, with all near zero.

The FTP MPG running average continues to trend near zero. The HFET MPG running average is acceptable, although the January monthly mean shows a sudden positive shift. An investigation into this change revealed the following:

1. The 95% confidence bars do not intersect zero, which indicates a statistically significant difference.

2. The PCTSITE table in the Appendix (page 6) shows that most EPA test sites were positively biased for the month.

3. REPCA data for the month was unreliable due to vehicle maintenance problems, which have since been resolved.

4. Analysis of the vehicle mix (cars versus light duty trucks) shows only about 7% of the total vehicles to be trucks. The vehicle mix sometimes biases fuel economy offsets, as trucks sometimes show larger positive fuel economy offsets than passenger cars.

5. We are not aware of any equipment problems during this period which would account for this offset.

In summary, we are not able to account for this month's sudden change in HFET correlation.

Selected Manufacturers Results:

As has been noted in past reports, Ford continues to demonstrate small FTP and HFET positive fuel economy offsets. Statistical analysis was performed on their combined results for the months of August through January (corresponding to the graphs) and the results are as follows:

| | FTP MPG | HFET MPG |
|---|---|---|
| Number | 25 | 31 |
| Mean | 1.27 | 1.27 |
| SD | 2.51 | 1.82 |
| 95% CI UL | 2.30 | 1.94 |
| LL | 0.24 | 0.60 |

Notice that neither of the 95% confidence intervals cross zero, indicating that these offsets are statistically significant. Although we do not yet have results from the current round of MVMA testing (which is in progress), past MVMA testing has shown Ford's fuel economy results to be near the mean. The paired data differences, therefore, seem to be related only to Certification testing and not the Ford laboratories' ability to accurately measure fuel economy. After we receive the results of the current round of MVMA testing we will discuss our observations with Ford, and will work with them to reduce these differences.

Paired Data Summary Statistics:

The following data was excluded from the summary statistics calculations in the Appendix:

January Paired Data Rejected for Exceeding Screening Limits

| Mfr | Vehicle ID | VI | Parameter | Screening Limit | Test Result | EPA Value |
|---|---|---|---|---|---|---|
| Puma | AM4270003 | 00 | %FTPMPG | +15% | +21.4% | 22.3 mpg |
| Puma | AM4270003 | 00 | %FTPMPG | +15% | +25.2% | 21.6 mpg |
| Puma | AM4270003 | 00 | %HFETMPG | +15% | +19.4% | 31.8 mpg |

The Puma (Sports Car America) tests were run at ATL in E. Liberty, Ohio. After two EPA FTP tests and one EPA HFET test, Puma accepted our fuel economy values.

If I can be of further assistance, please call on x267.

Attachments

cc: R. Lawrence
J. T. White
J. D. Carpenter
P. Reece
M. Caldwell
D. Danyko
D. Perkins
R. Gilkey
T. Schrodt

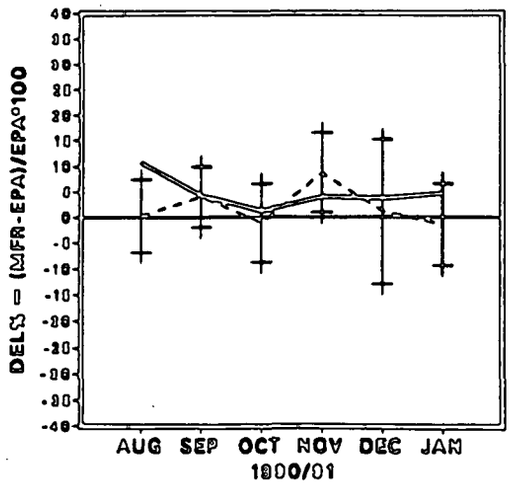
0113g

# ATTACHMENT A

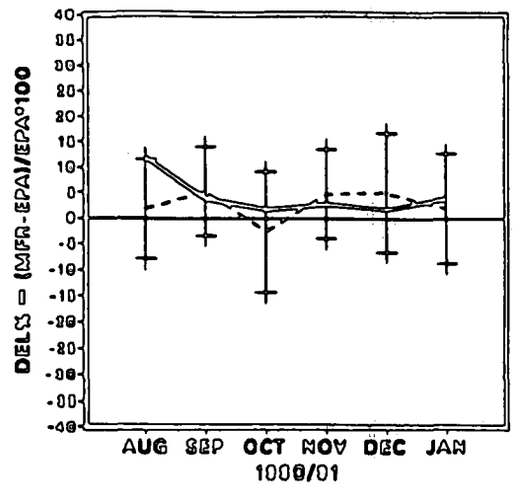
## Engineering Operations Division

## Monthly Paired Data Status Graphs

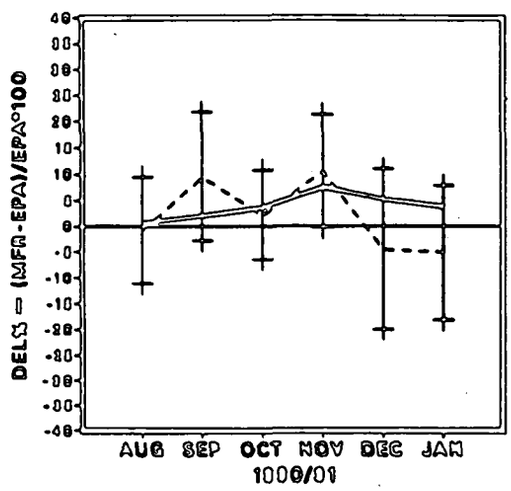
### FTP HC




### FTP CO




### FTP NOX



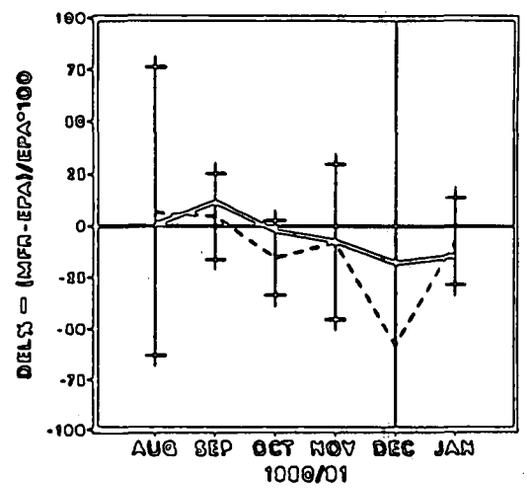

Legend

MONTHLY MEAN

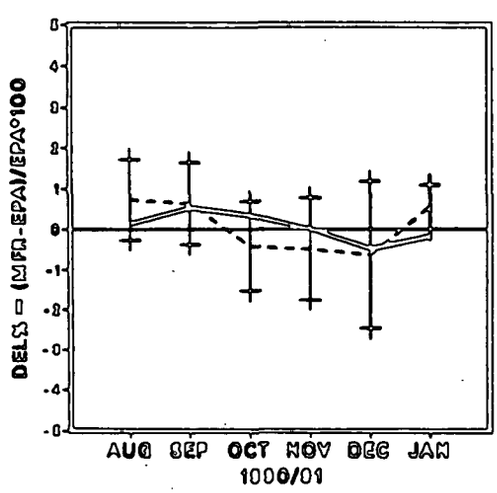
RUNNING AVERAGE

95% Confidence Interval

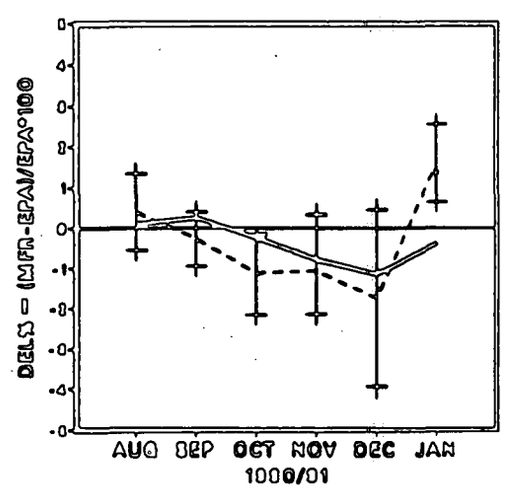
### EVAPORATIVE EMISSIONS




### FTP MPG




### HFET MPG

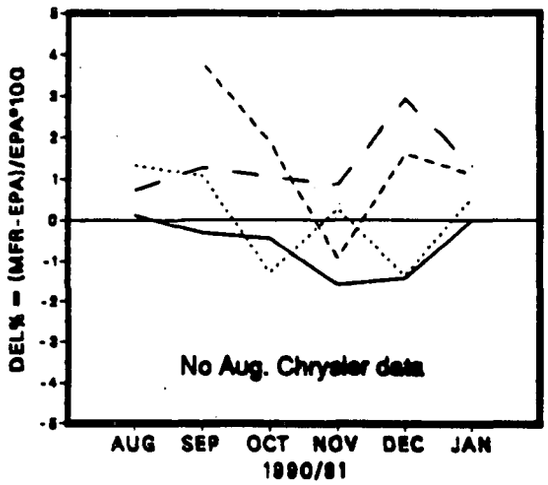


ATTACHMENT B

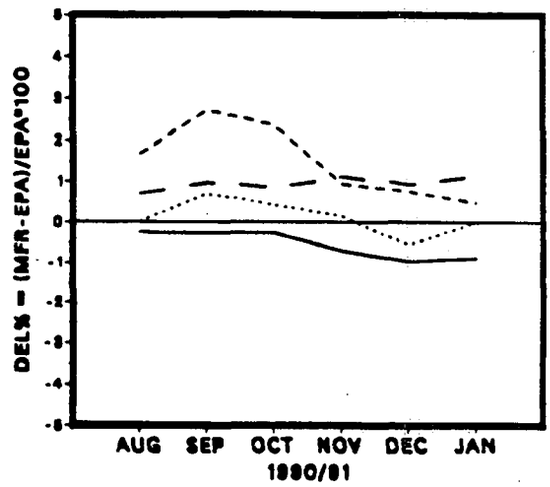
Engineering Operations Division

Manufacturer Paired Data Status Graphs

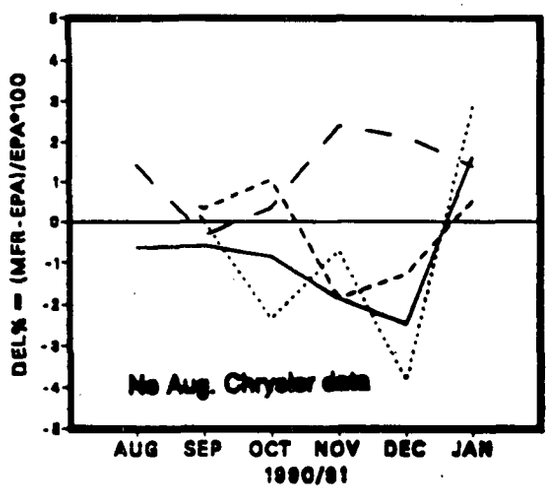
FTP MPG
MONTHLY MEANS




FTP MPG
THREE MONTH RUNNING AVERAGE

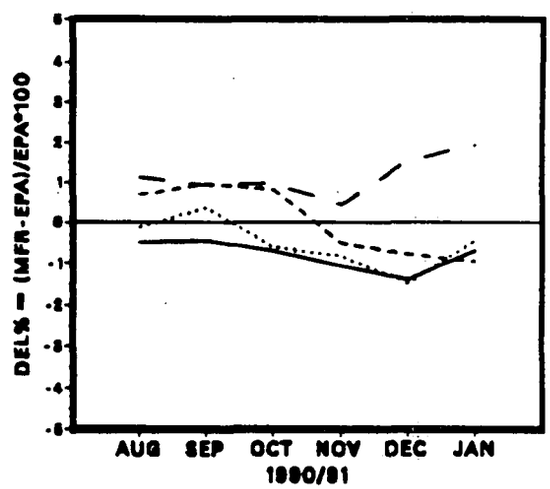



HFET MPG
MONTHLY MEANS

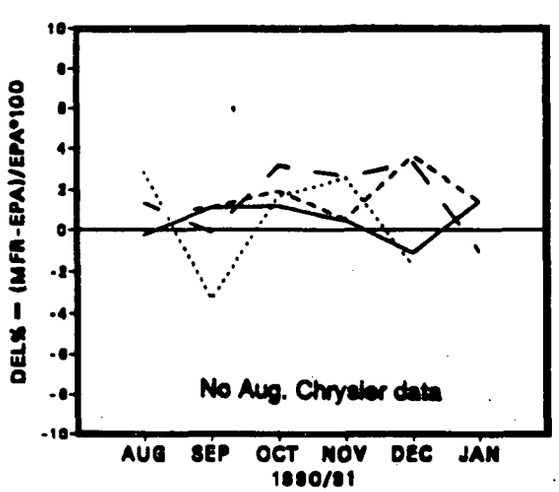



Legend
GM
FORD
CHRYSLER
OTHERS

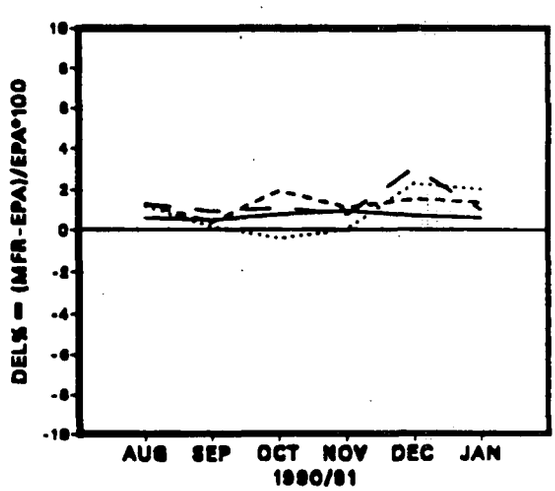
HFET MPG
THREE MONTH RUNNING AVERAGE




QUICKCHECK COASTDOWN
MONTHLY MEANS




QUICKCHECK COASTDOWN
THREE MONTH RUNNING AVERAGE



# ATTACHMENT C

## Engineering Operations Division
## Data Presentation Methodology

Graph Preparation:

Attachment A emission status graphs are based on an analysis of last test pairs and all confirmation strata. All emissions data has had tests removed which exceed screening limits. These limits are presented below. Fuel economy status graphs are prepared in a similar manner except that the "FE up by 1 or more" stratum has also been deleted.

Attachment B is developed using the same methodology as is used for Attachment A. It shows the monthly means and three month's running averages for individual manufacturer's fuel economy and quickcheck coastdown times. The running averages for individual months are grand averages of results from the month of interest and the two preceding months.

These graphs may change in subsequent months, as the test disposition of any individual test may change. These changes may result in tests being either included or excluded from the graphs.

Summary Statistics Preparation:

The data in the Appendix is based on an analysis of the last test pairs of all strata, and has had pairs removed which exceed the following screening limits:

### Paired Data Rejection Criteria

| | HC g/mi | CO g/mi | $CO_2$ g/mi | NOx g/mi | FE mpg | Evap g |
|---|---|---|---|---|---|---|
| **FTP** | | | | | | |
| Upper | 0.75 | 6.0 | 65.0 | 0.75 | 3.2 | |
| Lower | -0.75 | -6.0 | -65.0 | -0.75 | -3.2 | |
| **FTP (% Difference)** | | | | | | |
| Upper | 135.0 | 160.0 | 15.0 | 100.0 | 15.0 | * |
| Lower | -99.0 | -99.0 | -15.0 | -99.0 | -15.0 | * |

HFET

| | HC g/mi | CO g/mi | $CO_2$ g/mi | NOx g/mi | FE mpg | CDT sec |
|---|---|---|---|---|---|---|
| Upper | 0.2 | 6.0 | 45.0 | 1.0 | 4.5 | |
| Lower | -0.2 | -6.0 | -45.0 | -1.0 | -4.5 | |

HFET (% Difference)

| | | |
|---|---|---|
| Upper | 15.0 | 15% |
| Lower | -15.0 | -15% |

* Values to be set in revised paired data program currently under development.

# Engineering Operations Division
## Appendix

PROCESSED: 13:36:57 MAR 4, 1991

CCID: SN8Z

PROJECT: 7030

NAME: DAN

```
*************************
*                       *  TTTTT  EEEEE  SSSSS  TTTTT  SSSSS  U   U  M   M  SSSSS
*  PAIRED DATA ANALYSIS *    T    E      S        T    S      U   U  MM MM  S
*                       *    T    EEE    SSSSS    T    SSSSS  U   U  M M M  SSSSS
*   SUMMARY STATISTICS  *    T    E          S    T        S  U   U  M   M      S
*                       *    T    EEEEE  SSSSS    T    SSSSS   UUU   M   M  SSSSS
*************************
```

PERIOD OF ANALYSIS: 1- 1-91 TO 1-31-91
PAIR TYPE: EPA:MFR
MODEL YEAR(S): ALL
FUEL TYPES: NO LEAD (IND HO), NO. 2 DIESEL
VEHICLE ADJUSTMENT: ALL VEHICLES
TEST(S) EXCLUDED: TEST PAIRS THAT ARE NOT THE LATEST FOR EACH VEHICLE

TEST TYPE(S): EMISSION DATA FUEL ECONOMY
ANALYZER(S): ALL
DYNAMOMETER(S): ALL
EVAP CLASS: EVAP AND NON EVAP
HIGH ALTITUDE: NO HIGH ALTITUDE VEHICLES INCLUDED

COMMENTS:

| | FTP GAS | FTP DIESEL | HWFE GAS | HWFE DIESEL |
|---|---|---|---|---|
| | ****** | ****** | ****** | ****** |
| A. NUMBER OF VALID EPA PAIRS INCLUDED IN THE ANALYSIS | 16 | 0 | 15 | 0 |
| B. NUMBER OF VALID EPA PAIRS WITH EXTREME DATA EXCLUDED FROM THE ANALYSIS | 2 | 0 | 0 | 0 |
| C. NUMBER OF VALID EPA PAIRS NOT MEETING THE SELECTION CRITERIA | 0 | 0 | 1 | 0 |
| D. NUMBER OF VALID EPA TESTS WITH NO PAIRS OR NO PAIRS OF THIS PAIR TYPE | 1 | 0 | 1 | 0 |
| E. NUMBER OF VOID EPA TESTS | 2 | 0 | 0 | 0 |
| TOTAL NUMBER OF EPA TESTS IN THIS PERIOD | 21 | 0 | 17 | 0 |
| PAIRS MADE = (A+B+C) | 18 | 0 | 16 | 0 |
| POSSIBLE PAIRS = (A+B+C+D) | 19 | 0 | 17 | 0 |
| PERCENT PAIRED: ((A+B+C)/PPAIRS)*100% | 94.7 | 0.0 | 94.1 | 0.0 |
| PERCENT NOT PAIRED: (D/PPAIRS)*100% | 5.3 | 0.0 | 5.9 | 0.0 |
| | 100.0 | 0.0 | 100.0 | 0.0 |

PROCESSED: 13:36:57 MAR 4, 1991

PERIOD OF ANALYSIS: 1- 1-91 TO 1-31-91

PAIR TYPE: EPA:MFR

PAIRED DATA ANALYSIS

SUMMARY STATISTICS

FFFFF TTTTT PPPP DDDD EEEEE L
F T P P D D E L
FFF T PPPP D D EEE L
F T P D D E L
F T P DDDD EEEEE LLLLL

COMMENTS:

SIGNED DIFFERENCES: (MFR - EPA) - GASOLINE ONLY -

| | HC | | | CO | | | CO2 | | | NOX | | | MPG | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | NUM | AVG | STDEV | NUM | AVG | STDEV | NUM | AVG | STDEV | NUM | AVG | STDEV | NUM | AVG | STDEV |
| 20 CHRYS | 3 | 0.029 | 0.007 | 3 | 0.16 | 0.32 | 3 | -1.8 | 4.4 | 3 | -0.116 | 0.107 | 3 | 0.23 | 0.16 |
| 30 FORD | 3 | -0.041 | 0.007 | 3 | -0.25 | 0.32 | 3 | -2.4 | 5.5 | 3 | -0.013 | 0.075 | 3 | 0.27 | 0.23 |
| 40 GM | 8 | 0.002 | 0.040 | 8 | -0.07 | 0.76 | 8 | 4.1 | 6.4 | 8 | -0.002 | 0.089 | 8 | 0.02 | 0.17 |
| 265 HYNDA | 1 | -0.017 | 0.000 | 1 | 0.08 | 0.00 | 1 | 2.1 | 0.0 | 1 | -0.004 | 0.000 | 1 | 0.11 | 0.00 |
| 660 FUJI | 1 | 0.011 | 0.000 | 1 | 0.02 | 0.00 | 1 | 1.0 | 0.0 | 1 | -0.103 | 0.000 | 1 | 0.13 | 0.00 |
| ALL | 16 | -0.002 | 0.030 | 16 | -0.05 | 0.56 | 16 | 1.5 | 5.0 | 16 | -0.032 | 0.091 | 16 | 0.12 | 0.19 |

PROCESSED: 13:36:57 MAR 4, 1991

PERIOD OF ANALYSIS: 1- 1-91 TO 1-31-91

PAIR TYPE: EPA:MFR

PAIRED DATA ANALYSIS

SUMMARY STATISTICS

FFFFF TTTTT PPPP PPPP CCCC TTTTT
F T P P P P C T
FFF T PPPP PPPP C T
F T P P C T
F T P P CCCC T

COMMENTS:

PERCENT DIFFERENCES: ((MFR - EPA)/EPA) X 100% - GASOLINE ONLY -

| | HC | | | CO | | | CO2 | | | NOX | | | MPG | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | NUM | AVG | STDEV | NUM | AVG | STDEV | NUM | AVG | STDEV | NUM | AVG | STDEV | NUM | AVG | STDEV |
| 20 CHRYS | 3 | 14.2 | 4.0 | 3 | 14.3 | 30.6 | 3 | -0.44 | 1.03 | 3 | -31.5 | 20.7 | 3 | 1.12 | 0.77 |
| 30 FORD | 3 | -20.6 | 4.0 | 3 | -9.8 | 8.0 | 3 | -0.51 | 1.20 | 3 | 14.7 | 34.3 | 3 | 1.34 | 1.08 |
| 40 GM | 8 | -0.3 | 13.8 | 8 | 1.3 | 21.4 | 8 | 0.74 | 1.15 | 8 | -0.5 | 15.5 | 8 | 0.09 | 0.95 |
| 265 HYNDA | 1 | -8.5 | 0.0 | 1 | 6.7 | 0.0 | 1 | 0.58 | 0.00 | 1 | -2.3 | 0.0 | 1 | 0.45 | 0.00 |
| 660 FUJI | 1 | 5.4 | 0.0 | 1 | 1.4 | 0.0 | 1 | 0.41 | 0.00 | 1 | -26.9 | 0.0 | 1 | 0.69 | 0.00 |
| ALL | 16 | -1.4 | 14.9 | 16 | 2.0 | 20.2 | 16 | 0.26 | 1.14 | 16 | -5.2 | 24.2 | 16 | 0.58 | 0.98 |

PROCESSED: 13:36:58 MAR 4, 1991

PERIOD OF ANALYSIS: 1- 1-91 TO 1-31-91

PAIR TYPE: EPA:MFR

PAIRED DATA ANALYSIS

SUMMARY STATISTICS

COMMENTS:

SIGNED DIFFERENCES: (MFR - EPA) - GASOLINE ONLY -

| | HC | | | CO | | | CO2 | | | NOX | | | MPG | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | NUM | AVG | STDEV | NUM | AVG | STDEV | NUM | AVG | STDEV | NUM | AVG | STDEV | NUM | AVG | STDEV |
| 20 CHRYS | 2 | 0.021 | 0.018 | 2 | 0.10 | 0.05 | 2 | 0.8 | 4.7 | 2 | -0.106 | 0.144 | 2 | 0.17 | 0.57 |
| 30 FORD | 2 | -0.001 | 0.006 | 2 | 0.02 | 0.00 | 2 | -1.7 | 3.0 | 2 | -0.007 | 0.008 | 2 | 0.39 | 0.16 |
| 40 GM | 8 | -0.008 | 0.009 | 8 | 0.15 | 0.19 | 8 | -3.5 | 5.7 | 8 | -0.113 | 0.165 | 8 | 0.41 | 0.53 |
| 265 HYNDA | 1 | 0.010 | 0.000 | 1 | -0.30 | 0.00 | 1 | -1.3 | 0.0 | 1 | 0.004 | 0.000 | 1 | 0.77 | 0.00 |
| 660 FUJI | 1 | -0.006 | 0.000 | 1 | 0.03 | 0.00 | 1 | -7.4 | 0.0 | 1 | -0.036 | 0.000 | 1 | 1.10 | 0.00 |
| ALL | 14 | -0.001 | 0.013 | 14 | 0.08 | 0.19 | 14 | -2.8 | 4.9 | 14 | -0.083 | 0.136 | 14 | 0.45 | 0.48 |

PROCESSED: 13:36:58 MAR 4, 1991

PERIOD OF ANALYSIS: 1- 1-91 TO 1-31-91

PAIR TYPE: EPA:MFR

PAIRED DATA ANALYSIS

SUMMARY STATISTICS

COMMENTS:

PERCENT DIFFERENCES: ((MFR - EPA)/EPA) X 100% - GASOLINE ONLY -

| | HC | | | CO | | | CO2 | | | NOX | | | MPG | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | NUM | AVG | STDEV | NUM | AVG | STDEV | NUM | AVG | STDEV | NUM | AVG | STDEV | NUM | AVG | STDEV |
| 20 CHRYS | 2 | 61.9 | 80.0 | 2 | 230.2 | 321.7 | 2 | 0.32 | 1.76 | 2 | -48.8 | 40.7 | 2 | 0.82 | 1.74 |
| 30 FORD | 2 | -3.4 | 14.3 | 2 | 82.1 | 67.8 | 2 | -0.55 | 0.97 | 2 | -8.1 | 1.4 | 2 | 1.37 | 0.59 |
| 40 GM | 8 | -11.9 | 28.2 | 8 | 368.0 | 395.6 | 8 | -0.96 | 1.78 | 8 | -14.2 | 32.0 | 8 | 1.62 | 1.90 |
| 265 HYNDA | 1 | 33.3 | 0.0 | 1 | -75.0 | 0.0 | 1 | -0.54 | 0.00 | 1 | 4.2 | 0.0 | 1 | 2.11 | 0.00 |
| 660 FUJI | 1 | -12.5 | 0.0 | 1 | 37.5 | 0.0 | 1 | -2.54 | 0.00 | 1 | -24.7 | 0.0 | 1 | 3.62 | 0.00 |
| ALL | 14 | 3.1 | 41.6 | 14 | 249.2 | 344.7 | 14 | -0.80 | 1.57 | 14 | -17.7 | 29.9 | 14 | 1.61 | 1.65 |

PROCESSED: 13:36:57 MAR 4, 1991

PERIOD OF ANALYSIS: 1- 1-91 TO 1-31-91

PAIR TYPE: EPA:MFR

PAIRED DATA ANALYSIS

SUMMARY STATISTICS

COMMENTS:

DATA AND DIFFERENCES:

| | EPA GM/TEST | | | (M-E) DIURNAL | | | (M-E) H.SOAK | | | (M-E) TOTAL | | | (M-E)/E % DIFF | | | EPA SOAK | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | NUM | AVG | STDEV | NUM | AVG | STDEV | NUM | AVG | STDEV | NUM | AVG | STDEV | NUM | AVG | STDEV | NUM | AVG | STDEV |
| 20 CHRYS | 3 | 0.98 | 0.42 | 3 | 0.01 | 0.31 | 3 | -0.03 | 0.05 | 3 | -0.03 | 0.30 | 3 | -12.1 | 33.0 | 3 | 16.0 | 2.6 |
| 30 FORD | 1 | 0.30 | 0.00 | 1 | 0.08 | 0.00 | 1 | -0.07 | 0.00 | 1 | 0.01 | 0.00 | 1 | 3.3 | 0.0 | 1 | 22.0 | 0.0 |
| 40 GM | 3 | 1.03 | 0.35 | 3 | -0.10 | 0.05 | 3 | 0.12 | 0.15 | 3 | 0.01 | 0.10 | 3 | 0.9 | 11.8 | 3 | 17.0 | 0.0 |
| 265 HYNDA | 1 | 0.57 | 0.00 | 1 | -0.10 | 0.00 | 1 | -0.06 | 0.00 | 1 | -0.16 | 0.00 | 1 | -28.1 | 0.0 | 1 | 16.0 | 0.0 |
| 660 FUJI | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.0 | 0.0 | 0 | 0.0 | 0.0 |
| ALL | 8 | 0.86 | 0.40 | 8 | -0.04 | 0.18 | 8 | 0.01 | 0.12 | 8 | -0.02 | 0.18 | 8 | -7.3 | 21.6 | 8 | 17.1 | 2.5 |
| BY SHED: (EPA TESTS) | | | | | | | | | | | | | | | | | | |
| S001 | 1 | 0.57 | 0.00 | 1 | -0.10 | 0.00 | 1 | -0.06 | 0.00 | 1 | -0.16 | 0.00 | 1 | -28.1 | 0.0 | 1 | 16.0 | 0.0 |
| S002 | 2 | 0.92 | 0.04 | 2 | -0.12 | 0.06 | 2 | 0.10 | 0.25 | 2 | -0.02 | 0.19 | 2 | -1.3 | 20.5 | 2 | 17.0 | 0.0 |
| S003 | 2 | 1.43 | 0.01 | 2 | 0.13 | 0.30 | 2 | 0.03 | 0.08 | 2 | 0.16 | 0.23 | 2 | 11.3 | 15.9 | 2 | 15.0 | 2.8 |
| S004 | 3 | 0.55 | 0.23 | 3 | -0.08 | 0.17 | 3 | -0.02 | 0.04 | 3 | -0.11 | 0.13 | 3 | -16.7 | 23.9 | 3 | 19.0 | 2.6 |
| ALL | 8 | 0.86 | 0.40 | 8 | -0.04 | 0.18 | 8 | 0.01 | 0.12 | 8 | -0.02 | 0.18 | 8 | -7.3 | 21.6 | 8 | 17.1 | 2.5 |

PROCESSED: 13:36:58 MAR 4, 1991

PERIOD OF ANALYSIS: 1- 1-91 TO 1-31-91

PAIR TYPE: EPA:MFR

PAIRED DATA ANALYSIS

SUMMARY STATISTICS

COMMENTS:

COASTDOWN DATA: - GASOLINE TESTS -

| | MFR TRK | | | MFR QCHK | | | EPA QCHK | | | (MFR-EPA) | | | ((M-E)/E)% | | | VFHP (M-E) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | NUM | AVG | STDEV | NUM | AVG | STDEV | NUM | AVG | STDEV | NUM | AVG | STDEV | NUM | AVG | STDEV | NUM | AVG | STDEV |
| 20 CHRYS | 2 | 15.27 | 0.02 | 2 | 15.98 | 0.22 | 2 | 15.76 | 0.15 | 2 | 0.22 | 0.07 | 2 | 1.39 | 0.44 | 2 | -0.18 | 0.06 |
| 30 FORD | 2 | 14.52 | 2.07 | 2 | 14.75 | 2.28 | 2 | 14.91 | 2.36 | 2 | -0.16 | 0.08 | 2 | -1.01 | 0.36 | 2 | 0.15 | 0.05 |
| 40 GM | 8 | 15.23 | 2.57 | 8 | 15.08 | 2.65 | 8 | 14.88 | 2.63 | 8 | 0.20 | 0.30 | 8 | 1.41 | 2.03 | 8 | -0.29 | 0.38 |
| 265 HYNDA | 1 | 14.14 | 0.00 | 1 | 12.99 | 0.00 | 1 | 13.25 | 0.00 | 1 | -0.26 | 0.00 | 1 | -1.96 | 0.00 | 1 | 0.26 | 0.00 |
| 660 FUJI | 1 | 15.40 | 0.00 | 1 | 15.12 | 0.00 | 1 | 15.34 | 0.00 | 1 | -0.22 | 0.00 | 1 | -1.43 | 0.00 | 1 | 0.22 | 0.00 |
| ALL | 14 | 15.07 | 2.01 | 14 | 15.02 | 2.16 | 14 | 14.93 | 2.12 | 14 | 0.09 | 0.30 | 14 | 0.62 | 1.99 | 14 | -0.14 | 0.36 |

PROCESSED: 13:36:57 MAR 4, 1991

PERIOD OF ANALYSIS: 1- 1-91 TO 1-31-91

PAIR TYPE: EPA:MFR

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*********************************
*                               *   DDDD   EEEEE  L      SSSSS   III   TTTTT  EEEEE
*     PAIRED DATA ANALYSIS      *   D   D  E      L      S        I      T    E
*                               *   D   D  EEE    L      SSSSS    I      T    EEE
*     SUMMARY STATISTICS        *   D   D  E      L          S    I      T    E
*                               *   DDDD   EEEEE  LLLLL  SSSSS   III     T    EEEEE
*********************************
```

COMMENTS:

SIGNED DIFFERENCES: ( MFR - EPA ) - ALL FUELS -

| TP | SITE | HC | | | CO | | | CO2 | | | NOX | | | MPG | | | COUNT BY MFR GROUP | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | NUM | AVG | STDEV | NUM | AVG | STDEV | NUM | AVG | STDEV | NUM | AVG | STDEV | NUM | AVG | STDEV | AMC | CHR | FRD | GM | OTHR |
| FTP | | | | | | | | | | | | | | | | | | | | | |
| | D001 | 4 | 0.011 | 0.034 | 4 | 0.35 | 0.25 | 4 | 1.95 | 5.94 | 4 | -0.001 | 0.030 | 4 | 0.06 | 0.22 | 0 | 1 | 0 | 2 | 1 |
| | D002 | 3 | 0.001 | 0.036 | 3 | -0.20 | 0.58 | 3 | 3.00 | 5.07 | 3 | -0.029 | 0.210 | 3 | 0.10 | 0.23 | 0 | 1 | 0 | 2 | 0 |
| | D003 | 1 | -0.014 | 0.000 | 1 | 0.06 | 0.00 | 1 | -4.50 | 0.00 | 1 | -0.080 | 0.000 | 1 | 0.30 | 0.00 | 0 | 0 | 0 | 1 | 0 |
| | D004 | 3 | -0.013 | 0.027 | 3 | 0.01 | 0.03 | 3 | 0.20 | 3.94 | 3 | -0.041 | 0.078 | 3 | 0.20 | 0.26 | 0 | 0 | 1 | 1 | 1 |
| | D005 | 3 | -0.020 | 0.036 | 3 | -0.73 | 0.79 | 3 | 7.23 | 6.65 | 3 | -0.044 | 0.066 | 3 | -0.01 | 0.09 | 0 | 1 | 1 | 1 | 0 |
| | D006 | 2 | 0.020 | 0.077 | 2 | 0.27 | 0.54 | 2 | -5.20 | 1.98 | 2 | -0.042 | 0.079 | 2 | 0.26 | 0.07 | 0 | 0 | 1 | 1 | 0 |
| | D007 | 0 | 0.000 | 0.000 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.000 | 0.000 | 0 | 0.00 | 0.00 | 0 | 0 | 0 | 0 | 0 |
| | ALL | 16 | -0.002 | 0.036 | 16 | -0.05 | 0.56 | 16 | 1.51 | 5.87 | 16 | -0.032 | 0.091 | 16 | 0.12 | 0.19 | 0 | 3 | 3 | 8 | 2 |
| | A001 | 7 | 0.007 | 0.033 | 7 | 0.11 | 0.48 | 7 | 2.40 | 5.15 | 7 | -0.013 | 0.124 | 7 | 0.08 | 0.20 | 0 | 2 | 0 | 4 | 1 |
| | A002 | 4 | -0.013 | 0.022 | 4 | 0.02 | 0.04 | 4 | -0.98 | 3.98 | 4 | -0.051 | 0.066 | 4 | 0.22 | 0.22 | 0 | 0 | 1 | 2 | 1 |
| | A003 | 5 | -0.004 | 0.051 | 5 | -0.33 | 0.83 | 5 | 2.26 | 8.34 | 5 | -0.043 | 0.061 | 5 | 0.10 | 0.17 | 0 | 1 | 2 | 2 | 0 |
| | A004 | 0 | 0.000 | 0.000 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.000 | 0.000 | 0 | 0.00 | 0.00 | 0 | 0 | 0 | 0 | 0 |
| | ALL | 16 | -0.002 | 0.036 | 16 | -0.05 | 0.56 | 16 | 1.51 | 5.87 | 16 | -0.032 | 0.091 | 16 | 0.12 | 0.19 | 0 | 3 | 3 | 8 | 2 |
| HWFE | | | | | | | | | | | | | | | | | | | | | |
| | D001 | 4 | 0.002 | 0.010 | 4 | 0.10 | 0.29 | 4 | -2.45 | 7.11 | 4 | 0.005 | 0.010 | 4 | 0.51 | 0.69 | 0 | 1 | 0 | 2 | 1 |
| | D002 | 4 | 0.004 | 0.019 | 4 | 0.12 | 0.12 | 4 | -3.42 | 3.93 | 4 | -0.063 | 0.113 | 4 | 0.45 | 0.29 | 0 | 1 | 1 | 2 | 0 |
| | D003 | 1 | -0.010 | 0.000 | 1 | 0.04 | 0.00 | 1 | 2.40 | 0.00 | 1 | -0.390 | 0.000 | 1 | -0.03 | 0.00 | 0 | 0 | 0 | 1 | 0 |
| | D004 | 2 | 0.001 | 0.010 | 2 | 0.09 | 0.09 | 2 | -2.40 | 7.07 | 2 | -0.050 | 0.020 | 2 | 0.46 | 0.91 | 0 | 0 | 0 | 1 | 1 |
| | D005 | 3 | -0.011 | 0.014 | 3 | 0.02 | 0.26 | 3 | -4.23 | 4.02 | 3 | -0.147 | 0.173 | 3 | 0.53 | 0.37 | 0 | 0 | 1 | 2 | 0 |
| | D006 | 0 | 0.000 | 0.000 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.000 | 0.000 | 0 | 0.00 | 0.00 | 0 | 0 | 0 | 0 | 0 |
| | D007 | 0 | 0.000 | 0.000 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.000 | 0.000 | 0 | 0.00 | 0.00 | 0 | 0 | 0 | 0 | 0 |
| | ALL | 14 | -0.001 | 0.013 | 14 | 0.08 | 0.19 | 14 | -2.76 | 4.93 | 14 | -0.083 | 0.136 | 14 | 0.45 | 0.48 | 0 | 2 | 2 | 8 | 2 |
| | A001 | 8 | 0.003 | 0.014 | 8 | 0.11 | 0.21 | 8 | -2.94 | 5.34 | 8 | -0.029 | 0.082 | 8 | 0.48 | 0.49 | 0 | 2 | 1 | 4 | 1 |
| | A002 | 3 | -0.003 | 0.009 | 3 | 0.08 | 0.07 | 3 | -0.80 | 5.72 | 3 | -0.163 | 0.197 | 3 | 0.30 | 0.70 | 0 | 0 | 0 | 2 | 1 |
| | A003 | 3 | -0.011 | 0.014 | 3 | 0.02 | 0.26 | 3 | -4.23 | 4.02 | 3 | -0.147 | 0.173 | 3 | 0.53 | 0.37 | 0 | 0 | 1 | 2 | 0 |
| | A004 | 0 | 0.000 | 0.000 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.000 | 0.000 | 0 | 0.00 | 0.00 | 0 | 0 | 0 | 0 | 0 |
| | ALL | 14 | -0.001 | 0.013 | 14 | 0.08 | 0.19 | 14 | -2.76 | 4.93 | 14 | -0.083 | 0.136 | 14 | 0.45 | 0.48 | 0 | 2 | 2 | 8 | 2 |

PROCESSED: 13:36:57 MAR 4, 1991

PERIOD OF ANALYSIS: 1- 1-91 TO 1-31-91

PAIR TYPE: EPA:MFR

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*******************************
*                             *   PPPP    CCCC  TTTTT  SSSSS   III   TTTTT  EEEEE
*   PAIRED DATA ANALYSIS      *   P   P  C        T    S        I     T    E
*                             *   PPPP   C        T    SSSSS    I     T    EEE
*    SUMMARY STATISTICS       *   P      C        T        S    I     T    E
*                             *   P       CCCC    T    SSSSS   III    T    EEEEE
*******************************
```

COMMENTS:

PERCENT DIFFERENCES: ((MFR - EPA)/EPA) X 100% - ALL FUELS -

| TP | SITE | HC | | | CO | | | CO2 | | | NOX | | | MPG | | | COUNT BY MFR GROUP | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | NUM | AVG | STDEV | NUM | AVG | STDEV | NUM | AVG | STDEV | NUM | AVG | STDEV | NUM | AVG | STDEV | AMC | CHR | FRD | GM | OTHR |
| FTP | | | | | | | | | | | | | | | | | | | | | |
| | D001 | 4 | 2.0 | 14.5 | 4 | 20.0 | 21.0 | 4 | 0.43 | 1.38 | 4 | 0.8 | 12.4 | 4 | 0.26 | 1.05 | 0 | 1 | 0 | 2 | 1 |
| | D002 | 3 | 1.5 | 13.7 | 3 | -8.6 | 20.9 | 3 | 0.55 | 1.03 | 3 | -12.4 | 38.1 | 3 | 0.46 | 1.11 | 0 | 1 | 0 | 2 | 0 |
| | D003 | 1 | -5.2 | 0.0 | 1 | 4.2 | 0.0 | 1 | -0.93 | 0.00 | 1 | -14.0 | 0.0 | 1 | 1.66 | 0.00 | 0 | 0 | 0 | 1 | 0 |
| | D004 | 3 | -8.1 | 16.1 | 3 | 0.6 | 1.3 | 3 | 0.00 | 1.00 | 3 | 0.7 | 41.9 | 3 | 0.89 | 1.10 | 0 | 0 | 1 | 1 | 1 |
| | D005 | 3 | -4.6 | 13.3 | 3 | -15.4 | 13.9 | 3 | 1.25 | 0.82 | 3 | -7.0 | 24.1 | 3 | -0.17 | 0.60 | 0 | 1 | 1 | 1 | 0 |
| | D006 | 2 | 4.3 | 33.7 | 2 | 9.1 | 29.4 | 2 | -1.03 | 0.34 | 2 | -8.3 | 16.1 | 2 | 1.48 | 0.48 | 0 | 0 | 1 | 1 | 0 |
| | D007 | 0 | 0.0 | 0.0 | 0 | 0.0 | 0.0 | 0 | 0.00 | 0.00 | 0 | 0.0 | 0.0 | 0 | 0.00 | 0.00 | 0 | 0 | 0 | 0 | 0 |
| | ALL | 16 | -1.4 | 14.9 | 16 | 2.0 | 20.2 | 16 | 0.26 | 1.14 | 16 | -5.2 | 24.2 | 16 | 0.58 | 0.98 | 0 | 3 | 3 | 8 | 2 |
| | A001 | 7 | 1.8 | 12.9 | 7 | 7.7 | 24.5 | 7 | 0.48 | 1.15 | 7 | -4.8 | 24.7 | 7 | 0.35 | 0.98 | 0 | 2 | 0 | 4 | 1 |
| | A002 | 4 | -7.4 | 13.2 | 4 | 1.5 | 2.1 | 4 | -0.23 | 0.94 | 4 | -3.0 | 35.0 | 4 | 1.08 | 0.98 | 0 | 0 | 1 | 2 | 1 |
| | A003 | 5 | -1.1 | 19.9 | 5 | -5.6 | 22.2 | 5 | 0.33 | 1.39 | 5 | -7.5 | 18.9 | 5 | 0.49 | 1.03 | 0 | 1 | 2 | 2 | 0 |
| | A004 | 0 | 0.0 | 0.0 | 0 | 0.0 | 0.0 | 0 | 0.00 | 0.00 | 0 | 0.0 | 0.0 | 0 | 0.00 | 0.00 | 0 | 0 | 0 | 0 | 0 |
| | ALL | 16 | -1.4 | 14.9 | 16 | 2.0 | 20.2 | 16 | 0.26 | 1.14 | 16 | -5.2 | 24.2 | 16 | 0.58 | 0.98 | 0 | 3 | 3 | 8 | 2 |
| HWFE | | | | | | | | | | | | | | | | | | | | | |
| | D001 | 4 | -0.8 | 29.1 | 4 | 25.4 | 81.5 | 4 | -0.71 | 2.26 | 4 | 6.8 | 26.3 | 4 | 1.77 | 2.40 | 0 | 1 | 0 | 2 | 1 |
| | D002 | 4 | 20.1 | 66.0 | 4 | 416.7 | 357.5 | 4 | -1.02 | 1.11 | 4 | -21.7 | 38.2 | 4 | 1.62 | 1.13 | 0 | 1 | 1 | 2 | 0 |
| | D003 | 1 | -23.3 | 0.0 | 1 | 900.0 | 0.0 | 1 | 0.87 | 0.00 | 1 | -47.6 | 0.0 | 1 | -0.09 | 0.00 | 0 | 0 | 0 | 1 | 0 |
| | D004 | 2 | 20.4 | 46.6 | 2 | 72.1 | 48.9 | 2 | -0.77 | 2.50 | 2 | -20.7 | 5.7 | 2 | 1.54 | 2.94 | 0 | 0 | 0 | 1 | 1 |
| | D005 | 3 | -17.3 | 22.3 | 3 | 225.5 | 411.3 | 3 | -1.19 | 1.30 | 3 | -33.0 | 22.5 | 3 | 1.98 | 1.02 | 0 | 0 | 1 | 2 | 0 |
| | D006 | 0 | 0.0 | 0.0 | 0 | 0.0 | 0.0 | 0 | 0.00 | 0.00 | 0 | 0.0 | 0.0 | 0 | 0.00 | 0.00 | 0 | 0 | 0 | 0 | 0 |
| | D007 | 0 | 0.0 | 0.0 | 0 | 0.0 | 0.0 | 0 | 0.00 | 0.00 | 0 | 0.0 | 0.0 | 0 | 0.00 | 0.00 | 0 | 0 | 0 | 0 | 0 |
| | ALL | 14 | 3.1 | 41.6 | 14 | 249.2 | 344.7 | 14 | -0.80 | 1.57 | 14 | -17.7 | 29.9 | 14 | 1.61 | 1.65 | 0 | 2 | 2 | 8 | 2 |
| | A001 | 8 | 9.6 | 48.5 | 8 | 221.1 | 318.3 | 8 | -0.87 | 1.66 | 8 | -7.5 | 34.0 | 8 | 1.69 | 1.74 | 0 | 2 | 1 | 4 | 1 |
| | A002 | 3 | 5.9 | 41.5 | 3 | 348.1 | 479.2 | 3 | -0.23 | 2.00 | 3 | -29.6 | 16.0 | 3 | 1.00 | 2.28 | 0 | 0 | 0 | 2 | 1 |
| | A003 | 3 | -17.3 | 22.3 | 3 | 225.5 | 411.3 | 3 | -1.19 | 1.30 | 3 | -33.0 | 22.5 | 3 | 1.98 | 1.02 | 0 | 0 | 1 | 2 | 0 |
| | A004 | 0 | 0.0 | 0.0 | 0 | 0.0 | 0.0 | 0 | 0.00 | 0.00 | 0 | 0.0 | 0.0 | 0 | 0.00 | 0.00 | 0 | 0 | 0 | 0 | 0 |
| | ALL | 14 | 3.1 | 41.6 | 14 | 249.2 | 344.7 | 14 | -0.80 | 1.57 | 14 | -17.7 | 29.9 | 14 | 1.61 | 1.65 | 0 | 2 | 2 | 8 | 2 |

PROCESSED: 13:36:57 MAR 4, 1991

PERIOD OF ANALYSIS: 1- 1-91 TO 1-31-91

PAIR TYPE: EPA:MFR

PAIRED DATA ANALYSIS

SUMMARY STATISTICS

COMMENTS:
PERCENT DIFFERENCE: ((MFR - EPA)/EPA) X 100 %  - GASOLINE ONLY -

MPG PERCENT DIFFERENCE BY REASON FOR CONFIRMATION CODE

| | RANDOM AUDIT | | | FAILURE AT MFR | | | FE UP BY 1 OR MORE | | | NEW VEHICLE | | | FE CORR OFFSET | | | ALL OTHERS | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | NUM | AVG | STDEV | NUM | AVG | STDEV | NUM | AVG | STDEV | NUM | AVG | STDEV | NUM | AVG | STDEV | NUM | AVG | STDEV |
| 20 CHRYS | 1 | 1.74 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 2 | 0.82 | 0.80 |
| 30 FORD | 2 | 0.96 | 1.22 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 1 | 2.09 | 0.00 |
| 40 GM | 2 | -1.00 | 0.20 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 6 | 0.45 | 0.78 |
| 265 HYNDA | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 1 | 0.45 | 0.00 |
| 660 FUJI | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 1 | 0.69 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 |
| ALL | 5 | 0.33 | 1.40 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 1 | 0.69 | 0.00 | 0 | 0.00 | 0.00 | 10 | 0.69 | 0.82 |

PROCESSED: 13:36:58 MAR 4, 1991

PERIOD OF ANALYSIS: 1- 1-91 TO 1-31-91

PAIR TYPE: EPA:MFR

PAIRED DATA ANALYSIS

SUMMARY STATISTICS

COMMENTS:
PERCENT DIFFERENCE: ((MFR - EPA)/EPA) X 100 %  - GASOLINE ONLY -

MPG PERCENT DIFFERENCE BY REASON FOR CONFIRMATION CODE

| | RANDOM AUDIT | | | FAILURE AT MFR | | | FE UP BY 1 OR MORE | | | NEW VEHICLE | | | FE CORR OFFSET | | | ALL OTHERS | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | NUM | AVG | STDEV | NUM | AVG | STDEV | NUM | AVG | STDEV | NUM | AVG | STDEV | NUM | AVG | STDEV | NUM | AVG | STDEV |
| 20 CHRYS | 1 | 1.75 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 1 | -0.70 | 0.00 |
| 30 FORD | 2 | 1.37 | 0.59 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 |
| 40 GM | 2 | 3.46 | 2.08 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 6 | 1.01 | 1.54 |
| 265 HYNDA | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 1 | 2.11 | 0.00 |
| 660 FUJI | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 1 | 3.62 | 0.00 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 |
| ALL | 5 | 2.28 | 1.53 | 0 | 0.00 | 0.00 | 0 | 0.00 | 0.00 | 1 | 3.62 | 0.00 | 0 | 0.00 | 0.00 | 8 | 0.93 | 1.51 |