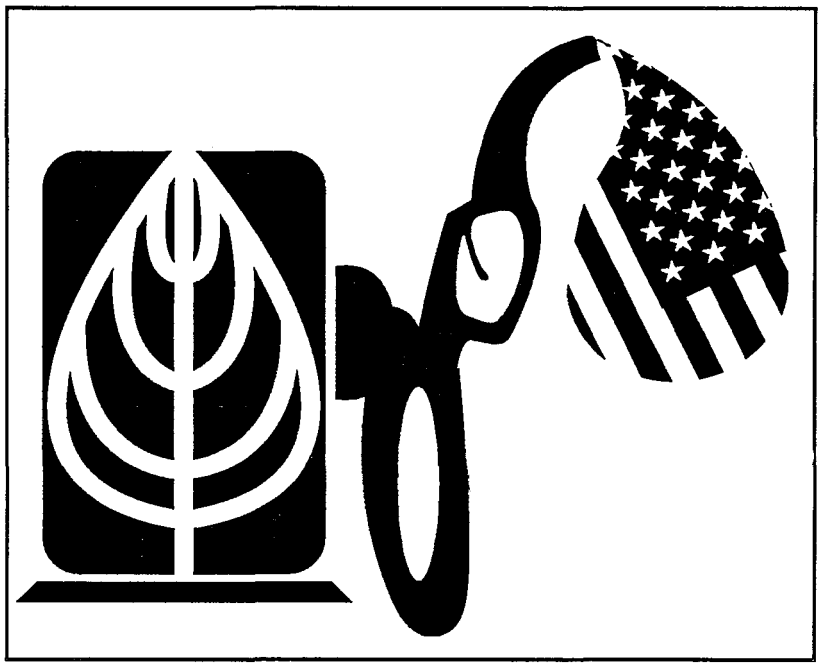
U.S. Department of Energy

# Data Query at the AFDC

## Using Oracle Data Query to access vehicle demonstration data at the Alternative Fuels Data Center



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# USING ORACLE DATA QUERY TO ACCESS VEHICLE DEMONSTRATION DATA AT THE ALTERNATIVE FUELS DATA CENTER

## EXAMPLE: LIGHT-DUTY VEHICLE DATA

**Rev. 2.0 November 1994**

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# Using Oracle Data Query to Access Vehicle Demonstration Data at the Alternative Fuels Data Center

## Example: Light-Duty Vehicle Data

## Rev. 2.0 November 1994

### 1.0 Introduction to the AFDC and Accessing the Data Base

Through funding by the Office of Alternative Fuels of the U.S. Department of Energy (DOE), the Alternative Fuels Data Center (AFDC) at the National Renewable Energy Laboratory (NREL) collects operating data from alternative-fueled vehicles. These vehicles include passenger sedans and light trucks (light-duty vehicles) operating within the federal fleet; heavy-duty trucks operating in private, city, or state fleets and co-funded by DOE; and municipal transit buses operating in revenue service around the country. This document gives examples of accessing the light-duty vehicle data.

The type of information collected on these vehicles includes: fuel usage (both reported by drivers and measured on chassis dynamometers); daily mileage (as reported by drivers); performance problems (subjectively reported by drivers); maintenance reports (from the shops performing the work); analysis of used lube oil and emissions (emissions and oil are measured/analyzed by NREL contractors for selected vehicles); and monthly fuel composition analyses (analyzed periodically by NREL-contracted laboratories at selected locations).

All data from these collection efforts are stored in a data base at the AFDC. To access the data, you must first obtain a login identification (userid) and a password from the AFDC. At that time, you are given a free copy of AFDC/View software. This communications package operates under Microsoft Windows on a PC connected to the AFDC data base via modem. AFDC/View consists of a large number of predetermined queries that allow you to very easily and intuitively select a query that retrieves the data of interest. With AFDC/View, the data are actually retrieved to your local PC. AFDC/View then can be used to generate formatted reports or graphs saved to a disk or copied to the Windows Clipboard and pasted into another Windows application (e.g., a spreadsheet, data base, graphics package, or editor) for further analysis.

AFDC/View is intended to be a complete tool when used with the proper hardware and connectivity (limited to PC Windows and modem). For other users (e.g., Internet users, modem pools, non-PC users, or non-Windows users), another access method, AFDC/Menu, is available. AFDC/Menu emulates all of the queries available in AFDC/View. A separate document is available that describes AFDC/Menu. AFDC/View and AFDC/Menu access all data in the data base, but you may wish to access the data in your own manner. Also, there will be times when new types of data are added to the data base that may not yet be accessible through AFDC/View and AFDC/Menu. Currently, AFDC/View and AFDC/Menu are limited to giving you "pre-canned" queries and must be programmed by AFDC programmers to access new types of data (e.g., when fuel analysis was added for the first time). To satisfy the users who wish to go beyond the capability of AFDC/View and AFDC/Menu, AFDC has made available a commercial tool, Oracle Data Query.

Oracle Data Query is a character-based data base access tool that operates on the AFDC computer and any terminal hardware (e.g., PC emulating a terminal, Macintosh terminal emulator, VT100 terminal) connected via modem or network access (e.g., Internet). The output from Data Query is either an ASCII or Lotus-compatible data file on the AFDC computer. No graphics are generated directly by Data Query, nor are the results automatically downloaded to the user. However, if you have the proper software (e.g., terminal program with a common data transfer protocol or Internet), the data can be downloaded to your local computer. To generate a

graph, you should select the worksheet file format; download the file using the data transfer protocols (see Section 7); and use Lotus 1-2-3, Excel, Quattro Pro, or other spreadsheet software on a local PC to generate graphs. An ASCII data file also can be displayed and captured by many communications programs.

To use Data Query, you will need to be more knowledgeable about the data base structure than an AFDC/View or AFDC/Menu user. Several example queries have been generated and are available to you as public queries. You should copy these queries to your own account (see Section 5.3 on Copying Queries). Once copied, the queries can be modified (see Section 5.4 on Modifying Queries) for your particular needs.

To help you understand the data base structure, a complete diagram of the data base is included in Appendix 1. This diagram also shows Join relationships (see Section 5.5 on how to join tables). Further help is available in Data Query for descriptions of every table and every column provided on-line and in Appendix 1. These descriptions can be seen whenever you do a show List (see Section 5.5) specifying tables and columns.

To further help you understand the data base and obtain the data in which you are interested, detailed explanations of how to get data on vehicle specifications, mileage, fuel use, performance, maintenance, emissions, and oil analysis are given later in this documentation.

## 2.0 Data Bases, Tables, and Joining Tables

The AFDC uses the Oracle Relational Data Base Management System for storage of all vehicle demonstration data. A relational data base contains the data in data base tables that can be related to each other. Within tables are fields or columns. Two tables are considered to be related if they can be tied together by a common column or field. As an example, mileage data are collected in a mileage table called LDV_MILEAGE. This table contains the vehicle identification number (VIN), along with the date and the daily beginning and ending odometer readings for every vehicle used on any given day. If you know something else about the vehicle but not the VIN, you should still be able to find the desired information. For example, if you know the license plate number, you can look up the VIN in the LDV_VEH table containing the cross reference between license plate number and VIN. You could then search the LDV_MILEAGE table for entries with the correct VIN. This is not very efficient. An easier way is to Join the two tables by VIN. Once joined, you can specify a search for mileage records (from LDV_MILEAGE) corresponding to a certain license plate number (from LDV_VEH) without directly referring to the VIN.

Joins are very useful in searching relational data bases. The following sections on retrieving various types of data will point out when you may want or need to Join tables. In some cases, the AFDC has joined two tables together in a View. A View appears as a table, but the Join has already been done so you do not have to specify it. The down side of a View is that it is slower in retrieving data.

## 3.0 Basic Data Tables and Calculated Summary Tables

Data, after passing the quality assurance procedures at the AFDC, are entered into basic data tables. These tables (e.g., LDV_MILEAGE, LDV_FUEL_ADD, etc.) contain all data received from the field. In addition to these basic tables, several tables are generated that summarize the data, typically on a monthly basis (e.g., EMIS_SUM, etc.). These tables are calculated from the basic data tables and are updated every night. Calculated tables of this type are indicated as such in the road map of tables (see Appendix 1) and in their on-line descriptions.

## 4.0 Understanding the Development of Queries Using Data Query

To effectively use Data Query to access the AFDC, you need a good understanding of the data base tables. The following sections illustrate how various types of data are organized and how to build a query to retrieve the data. Additionally, to help you understand how to query the data base, a set of examples has been created.

To run one of these queries, you should execute Run Query from the Action Menu (see examples later in the documentation). To select different options in the public queries, first execute the Copy Query from the same menu. Once copied, the queries can be modified to suit your needs using Modify Query (See Section 5 for an explanation of these commands.)

### 4.1 Understanding the Decal ID

Vehicles in the system can be identified by VIN, Decal ID, or GSA license plate number. The VIN is useful in that it is permanently attached to the vehicle and is the best way to identify vehicles in the field or in the original equipment manufacturer's (OEM) records (such as maintenance reports). The AFDC Decal ID has been physically applied to some of the earlier vehicles in the field, but that practice has not been continued with more recently purchased vehicles. However, a unique Decal ID does exist for all vehicles in the data base, and it contains a wealth of important information. It contains the location, design fuel, model, and whether the vehicle is being used as a control. The Decal ID is up to 8 characters in length. Table 1 indicates the structure of the information contained in the Decal ID.

**TABLE 1**
**Decal ID Codes***

| Characters 1, 2<br>---<br>Site | Character 6<br>---<br>Fuel | Character 7<br>---<br>Vehicle |
|---|---|---|
| AR- Argonne, IL | C-CNG | L-Chevrolet Lumina Sedan |
| BK-Bakersfield, CA | E-E85 | C-Chevrolet C-2500 Pickup |
| DC-Washington, DC | G-Gasoline | T-Ford Taurus Sedan |
| DT-Detroit, MI | M-M85 | S-Dodge Spirit Sedan |
| DV-Denver, CO | L-LNG (future) | R-Chrysler B250 Van |
| EL-El Paso, TX | P-LPG (future) | E-Ford Econoline E150 Van |
| HS-Houston, TX | | |
| LA-Los Angles, NY | | |
| NY-New York, NY | | |
| SD-San Diego | | |

*Digits 3, 4, and 5 are sequential numerical identifiers given at each site. Character 8 (if used, always a **C**) denotes a control vehicle.

As an example, **'DT023MLC'** can be decoded as follows: **DT** designates the site, Detroit; **023** denotes the twenty-third car in this program in Detroit; **M** denotes the fuel type, M85; **L** denotes the vehicle model, a Lumina; and **C** indicates that this car is a control vehicle.

### 4.2 Developing Queries for Vehicle Specifications

Data Base Tables for Vehicle Specification Information:

LDV_VEH_TYPES
LDV_VEH

To understand and use the vehicle demonstration data, it is important to know the characteristics of the vehicles. Complete specifications for all vehicles in the program are kept in the LDV_VEH_TYPES table. To search for a particular vehicle, you will need to know the Decal ID or VIN or license plate number. By Joining LDV_VEH_TYPES to the LDV_VEH table using the common field VEHICLE_TYPE_NUM, you can select information (fields or columns) on the vehicle from the LDV_VEH_TYPES and set the condition (see Section 5.4 on Conditions) equal to the known VIN, or Decal ID, or license plate number. If you wish to retrieve all vehicles from one site, you can use the LIKE conditional (see Section 5.4) and the first two characters of the Decal ID.

### 4.3 Developing Queries for Mileage Information

Data Base Tables for Mileage Related Information:

LDV_MILEAGE

Driver-reported daily mileage is stored in the LDV_MILEAGE table. This table contains the date, daily beginning and ending odometer readings, and the VIN. Again, to search for vehicle data by Decal ID or license plate number, you must Join to the LDV_VEH table using the common field, VIN. If you wish to select the vehicle by its VIN, then joining is not necessary.

To select the miles driven each day by a vehicle or set of vehicles, specify the difference between the ending and beginning odometer columns, END_ODOM - BEGIN_ODOM. To calculate the total reported miles driven by a vehicle, specify SUM (see Section 5.4 on Modifying Queries) of END_ODOM-BEGIN_ODOM. To determine the number of days that the vehicle was reported to be driven, specify COUNT of END_ODOM. To determine the latest odometer reading, specify MAX of END_ODOM. To determine the odometer when the vehicle was put in service, specify MIN of BEGIN_ODOM. You should note that the reported miles driven will not necessarily be the same as the latest odometer because of missing data.

It should also be noted that multiple vehicles can be selected using either AND in the Condition or LIKE with a partial Decal ID or VIN (see Section 5.4 on Modifying Queries).

### 4.4 Developing Queries for Fuel Usage

Data Base Tables for Fuel Usage Information:

LDV_FUEL_ADD

Information on the fuel used by a vehicle is stored in the LDV_FUEL_ADD table. Included in this table are the date, amount of fuel added (in U.S. gallons for liquid fuels and gasoline equivalent gallons for gaseous fuels), fuel type (M is M85, E is E85, C is CNG, and G is gasoline), and current odometer reading. Most users are interested in fuel economy. Determining the difference between odometer readings in two records (miles driven between refuels) is difficult in a data base. It is suggested that if you are interested in the individual refuel occurrences, the AMOUNT_ADDED and CUR_ODOM fields should be selected. The data then can be exported as a worksheet file, downloaded (see Section 7.0 on Downloading), placed in a spreadsheet, and the miles between refuels and the individual refuelings calculated.

To calculate monthly averages, SUM the fuel consumed and divide by SUMed miles from the mileage table.

As with LDV_MILEAGE, data are stored in the LDV_FUEL_ADD table by VIN. To search by Decal ID or License Plate Number, you will need to Join to the LDV_VEH table, using VIN as the common field.

### 4.5 Developing Queries for Performance

Data Base Tables for Performance Related Information:

LDV_PERF

Drivers report their perceptions of how well the vehicle is operating by recording daily any of eight categories of problems as troublesome or annoying. The data are then coded and stored in the LDV_PERF table. Each entry is stored as date, problem code (PROB_CODE), and problem severity (PROB_SEVERITY_CODE). Again, the data are stored by VIN; therefore, to search by Decal ID or License Plate Number requires Joining to the LDV_VEH table.

The problem codes currently being collected are:

| PROB CODE | Description |
|---|---|
| E | Check Engine Light Problem |
| H | Hard to Start |
| C | Hesitation/Coughing |
| I | Idle Quality Problems |
| L | Lack of Power |
| P | Pinging |
| S | Stalled After Starting |
| T | Stalled in Traffic |

A second code is used to specify the problem as Annoying (A), Troublesome (T), or No Comment (X). This is stored as the PROB_SEVERITY_CODE. Please note that there are other PROB_CODEs in the data base from early in the program, and there is an 'S' code for superior; therefore, a simple COUNT of PROB_CODE will NOT indicate the number of reported problems. If you need a count, add a condition that selects only the eight PROB_CODEs ('E','H','C','I','L','P','S','T') and three PROB_SEVERITY_CODEs ('A','T', 'X').

### 4.6 Developing Queries for Maintenance

Data Base Tables for Maintenance Information:

LDV_SHOP_MAINT_P
LDV_SHOP_REPAIRS_P
LDV_DRV_MAINT
LDV_DRV_OIL_ADD

Maintenance data are collected from area automotive dealerships that have been assigned to perform maintenance on alternative fueled vehicles. This information is stored in two tables: LDV_SHOP_MAINT_P and LDV_SHOP_REPAIRS_P. The purpose of having two tables is that one visit to the maintenance shop (one record in LDV_SHOP_MAINT_P) may have performed several repairs (several records in LDV_SHOP_REPAIRS_P). The information stored in LDV_SHOP_MAINT_P includes the date, odometer reading, dealership number, and dealer work order number. The LDV_SHOP_REPAIRS_P table contains the description of the repair (CPSC_REPAIR_CODE), the type of repair (SERVICE_CODE), and various cost data. The LDV_SHOP_MAINT_P table also contains a system-generated number, MAINT_NUM, that links it to the same field in the LDV_SHOP_REPAIRS_P. LDV_SHOP_REPAIRS_P contains no information about the vehicle identification. Searching for a particular vehicle in LDV_SHOP_REPAIRS_P must be accomplished by linking to the LDV_SHOP_MAINT_P table where VIN and Decal ID are stored.

Repair descriptions are stored as codes rather than as text. To get the actual repair description, the CPSC_REPAIR_CODE must be linked to the AFDC_CODES table. (Please refer to Example Query 5 in Appendix 3 for the procedure to do this.) The description of the SERVICE_CODE can also be found in the AFDC_CODES table. However, because there are so few SERVICE_CODEs, they are listed below:

| SERVICE_CODE | DESCRIPTION |
|---|---|
| RPR | Repair |
| RPL | Replace |
| TST | Diagnostic Test |
| ADJ | Adjustment |
| R&R | Repair & Replace |
| SM | Scheduled Maintenance |

There is also a table in the system for driver-reported maintenance: LDV_DRV_MAINT. This table has information reported by the driver regarding when the vehicle was taken in for maintenance. These data are generally not complete, even as to the total number of occurrences, and are definitely not reliable regarding the the type of maintenance. The only use for these data is to verify that for every driver-reported maintenance, a corresponding shop maintenance record exists. More shop maintenance records exist than are reported by drivers.

### 4.7 Developing Queries for Emissions Test Results

Emissions: Related Basic Data Tables
LDV_EMISSIONS_P
LDV_EMIS_SPEC_P

Emissions: Related Calculated Summary Tables
EMIS_SUM

Emissions are measured on a selected number of vehicles by testing laboratories contracted by NREL. While the number of vehicles being measured is limited, the vehicles chosen will have their emissions tested on a regular schedule. Generally, the emissions are measured at 4,000 miles, 10,000 miles, and then every 10,000 miles thereafter for the life of the project.

Like the maintenance data, the emissions data are stored in two tables: EMISSION_TESTS_P and EMISSION_DATA. However, to aid the user, a VIEW of these two tables has been created, called LDV_EMISSIONS_P. LDV_EMISSIONS_P contains nearly all of the same data as the two individual tables and is much easier to query. As with most other tables, the data are stored by VIN. To search for Decal IDs, a JOIN will have to made with LDV_VEH.

Data contained in LDV_EMISSIONS_P include many fields that contain supporting information items, such as Vmix or dilution factor, and may not be of interest to the general user.

### 4.8 Developing Queries for Oil and Fuel Analysis Results

Oil and Fuel Analysis Related Basic Data Tables:
FLUID_SAMPLES
FLUID_ANALYSIS_DATA

Used lubricating oil is being collected from a small set of vehicles. For these vehicles, a sample is taken from each standard oil change. The sample is sent to an NREL-contracted laboratory and analyzed for various metals, contaminants, and indicators of oil breakdown. Fuel is also collected periodically from demonstration sites and analyzed. The results of these analyses are contained in two tables: FLUID_SAMPLES and

FLUID_ANALYSIS_DATA. The FLUID_SAMPLES table contains information on the vehicle, location, date, odometer, and laboratory conducting the analysis. The second table, FLUID_ANALYSIS_DATA, contains all of the analysis results. The field COMPONENT_TYPE_CODE in the FLUID_ANALYSIS_DATA table contains an abbreviated test name. The complete name can be found in the AFDC_CODES table. The analyses done on fluid samples are listed in Appendix 4.

## 5.0 Running Data Query

Data Query is a commercial tool developed by Oracle Corporation. It has drop-down menus and point and shoot capabilities, but it is completely character based, not graphics based. This means that it can be run equally well from any terminal device connected to the AFDC Unix computer. That could be a VT-100 connected by modem or Internet or a PC emulating a terminal (using a DOS communications package, Windows Terminal program, or network terminal emulator). There are no special requirements on the user side.

A reference book titled *Oracle Data Query User's Guide and Tutorial, Version 3.0* (part number 6551-30-0492) can be purchased directly from Oracle for approximately $75. Two other reference books from Oracle that may be of interest are *SQL*PLUS User's Guide and Reference, Version 3.0* (part number 5142-V3.0 0691, $65) and *Introduction to SQL* (part number 19464-0489, $20). Oracle's telephone number is (415) 506-7000 (Oracle accepts phone orders with credit cards).

## 5.1 Logging Into Data Query

**Following are the steps used to access Oracle Data Query:**

1. Using your system's access procedure (Internet would not require a phone number), connect to the AFDC computer:

   (303) 275-4199 for modem connection

   telnet afdc.nrel.gov or telnet 192.48.125.16 for Internet connection

2. The AFDC computer will respond with:

   login:

3. At this prompt, type in your assigned userid:

   *userid*

4. The computer will respond with:

   password:

5. At this point, enter your corresponding password:

   *password*

6. The computer will respond with:

   enter terminal type (VT100)

7. Press Return/Enter to select a VT100 terminal type. This will yield the AFDC prompt:

   AFDC>

8. Execute Data Query by typing:

*go*

From the "go" menu, select item **2) Data Query**. The opening menu in Data Query allows you to select Action or Help. To select an option, simply arrow to the desired selection or select the appropriate key letter and press **Enter**. A drop-down menu will appear, as shown in Figure 1.

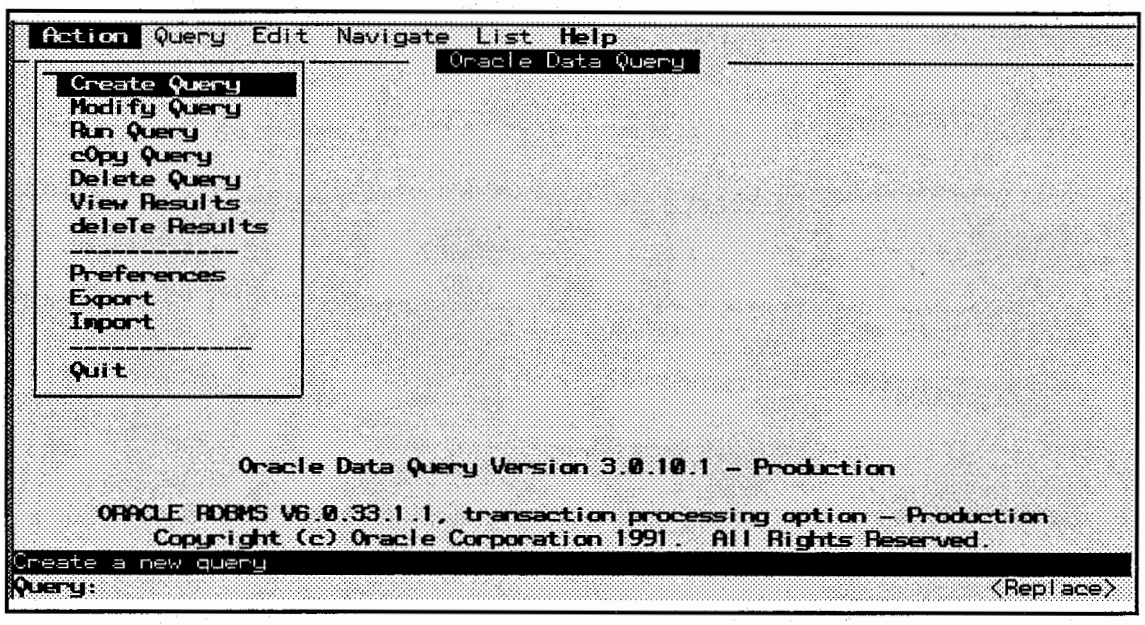


***Figure 1. Opening Action Menu***

From the Action Menu, you can select Create, Modify, Run, or Copy Queries. In addition, you can also Export or Import Queries. Most of these features will be described later. Oracle applications map various Data Query functions to keys and key combinations on the terminal. Listed in Appendix 2 are the keyboard mappings for a VT100. This listing can be obtained on-line for the type of terminal being used by pressing ***^K*** (control key and K). Other common keys on the VT-100 include: List (of values), **^F**; Do key, **<F3>** (function key F3); and the cancel key, **<F4>**.

## 5.2 Running Queries

The Run Query command on the opening Action Menu allows the user to run an existing query. An existing query is either one previously created by the user or a Public Query. To run a query, select Run Query from the Action menu by either moving to Run Query with the cursor and pressing **Enter**, or by typing an **R**. From the Run Query screen, you can either type in the name of an existing query or execute the List command. The public queries are marked with a **P** in the second field (see Figure 2).

```
Action  Query  Edit  Navigate  List  Help
                    Oracle Data Query

                        Run Query
Name                Description

                    Available Queries
      Query Name          Date        Description
Find

 -> EXAMPLE1        P   01-SEP-94   Monthly M85 Consumed in Detroit
    EXAMPLE2        P   01-SEP-94   Individual Refueling Occurences
    EXAMPLE3        P   01-SEP-94   Summary Emissions
    EXAMPLE4        P   01-SEP-94   Monthly Mileage for Luminas by Site
    EXAMPLE5        P   01-SEP-94   Detailed Maintenance by Vehicle
    EXAMPLE6        P   01-SEP-94   Detailed Emissions Results
    EXAMPLE7        P   01-SEP-94   CNG Fuel Analysis
    EXAMPLE8        P   01-SEP-94   Used Lube Oil Analyses

Use the arrow keys to move to the required query and [Return] to choose one
Query:                                                  <List><Replace>
```

*Figure 2. Run Query Screen showing List*

By typing either the first few characters of the name before executing List or by moving to the Find line of the List, you can refine the list. For example, typing EXAMPLE1 in the Find field (move to Find field using the Previous Field key) shows only the queries whose short name begins with EXAMPLE1 (see Figure 3 below).

```
Action  Query  Edit  Navigate  List  Help
                    Oracle Data Query

                        Run Query
Name                Description

                    Available Queries
      Query Name          Date        Description
Find  EXAMPLE1

 -> EXAMPLE1        P   01-SEP-94   Monthly M85 Consumed in Detroit

Use the arrow keys to move to the required query and [Return] to choose one
Query:                                                  <List><Replace>
```

*Figure 3. Run Query Screen showing EXAMPLE1 in Find field and returned list of queries*

To select a query, move to the query name and press **Enter**. The name will be transferred to the Run Query Screen. Press **Enter** again, and the query will execute, showing results (see Figure 4).

```
Down  Up  Left  Right  Top  Bottom  Print  Other-Runs  Save  Help  Quit
                Oracle Data Query Results Browser
Gallons of M85 Consumed in Detroit

Month   Fuel Consumed, gal
------  ------------------
91-01                12.5
91-03               116.5
91-04              1087.2
91-05              1117.7
91-06               829.7
91-07               560.3
91-08               692.5
91-09               467.2
91-10               765.2
91-11               548.9
91-12               551.1
92-01               600.5
92-02               816.9

   File 03077.LIS        Run on 12-NOV-1994 15:09        Screen 1  of 3
Show the next page of output
Query: EXAMPLE1 - Monthly M85 Consumed in Detroit                <Replace>
```

*Figure 4. Results of EXAMPLE1 Query*

From this screen the results can be viewed. Note the commands for up, down, left, right, or save to an ASCII file for future downloading. Quitting from the Results screen returns you to the Action Menu.

The printing function has been disabled for remote users (printing would occur at the Data Center in Colorado and not locally). Some communications software allows the user to turn on a "capture" mode. If this is done, you can view your results after logging off the AFDC computer. Other programs, like Windows Terminal, let you highlight the data, copy to the clipboard, and then to another program. If neither works, you can save the results as a file and then transfer it to your computer with the AFDC Download System after leaving Data Query.

### 5.3 Copying Queries

Many, if not all, of the Public queries have conditions that you may wish to change. These may include date ranges, vehicle number, site locations, etc. As they exist, the Public queries cannot be modified. They must first be copied to your space. To copy a query, select Copy from the Action Menu, either by moving to the Copy command with your cursor keys and pressing **Enter** or typing **O** (C is used for Create). A Copy Query screen appears, asking for the name of the existing query and the new name. As with the Run command, the show List function can be used for finding the name of the existing query; selecting is the same as for Run.

Once an existing query has been identified, you must enter a name and description for the copy (see Figure 5).

```
Action  Query  Edit  Navigate  List  Help
                    Oracle Data Query

                    Copy Query
Name                Description
EXAMPLE1            Monthly M85 Consumed in Detroit
                    To
Name                Description
MYEXAMP1            Monthly M85 Consumed in Washington, DC

Oracle Data Query Version 3.0.10.1 - Production

ORACLE RDBMS V6.0.33.1.1, transaction processing option - Production
Copyright (c) Oracle Corporation 1991. All Rights Reserved.
Please enter a short description for this query and press [Return].
Query:                                                        <Replace>
```

*Figure 5. Copy Query screen showing two names filled out*

Once copied, you are returned to the Action Menu.

### 5.4 Modifying Queries

A copied file can be run just like the original, or, more importantly, it can be modified to suit your needs. To modify a query, select Modify Query from the Action Menu by either moving the cursor to Modify and pressing **Enter** or by pressing **M**. A Modify Query screen appears, requesting the name of the query to be modified. As before, you can do a show List to select the query from a list or type the name of the query directly. Once the query has been identified, press **Enter** and the query will be displayed as a list of Tables, Columns, Conditions, and Sorts (see Figure 6). You can move to any of these and make changes. Use caution when modifying the selected tables (i.e.,eliminating or adding tables), as this could disrupt the currently selected Fields, Joins, and Conditions.

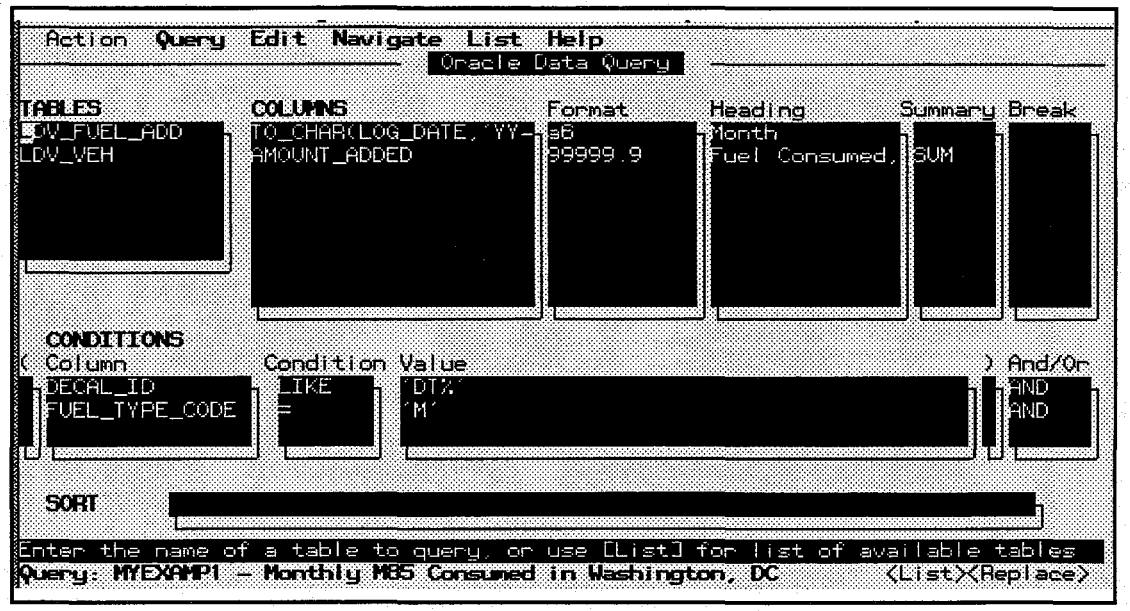


*Figure 6. Modify Query Screen*

**Columns** - To modify a column, move to the column section by first moving to the Menu, ^ **G**, on a VT100 (use show Keys, ^K, to determine the Menu key on your terminal). From the Menu move to Navigate and press Enter. A drop-down menu will appear; select Column (move to it and press **Enter** or C). Your cursor will be moved to the Columns area. From here, move with the cursor or Tab to the line that you would like to change. To delete a line, move to it and then press the Menu key; move to Edit, press **Enter** and then Delete. To enter a new field, press **Menu, Edit, Insert** (to insert in middle of list). Then you can do a show List of field names. Select one or more field names and press **Do** (F3) to return to the main screen. Formats and column names also can be edited by moving to them and typing in new values.

To calculate the Average, Sum, Maximum, Minimum or Count of a field, move to the summary field and enter AVE, SUM, MAX, MIN or COUNT. A show List also can be used here to see the available options. It is important to note that the default format for date fields will not allow for a proper calculation of MAX (most recent date) or MIN (earliest date). The default date format is DD-MM-YYYY. Data Query actually converts this to a character (rather than keeping it as a date) before it applies the MAX or MIN function; therefore, 31-Oct will generally be your maximum date (using this format). To correct for this, change the date format to YY-MM-DD. This format will return the correct maximum or minimum date.

**Conditions** - Probably the most common change that you will want to make to queries is in the Conditions area. The public queries that have been developed are generally designed to return data on a specific vehicle, site, date range, etc. In the public query, a "dummy" condition has been inserted, such as a specific vehicle, with the hope that users will Copy the query and then Modify the Condition. Generally, there is nothing special about the condition originally entered in the Public query.

To change the Condition, move to that area from the Menu, Navigate, Condition option. To change the value of a Condition, move to Value area and type a new Condition. In general, character strings must be enclosed in single quote marks ('). Dates also should be enclosed in single quotation marks, and the best format for dates is DD-MMM-YY, (e.g., 21-JUN-93). The Conditions are items such as Equal, not Equal, Like, not Like, greater than, etc. You can do a show List for valid Condition values. When you specify equal (=), the value must be

exactly the same as that in the column. As an example, when looking for vehicles by Decal ID, the full Decal ID must be specified (e.g., 'DT001ML'). Just specifying 'DT001' will not be specific enough ('DT001' is not equal to 'DT001ML'). However, if you use the Like condition and a "wild card," the system will find a match.

The Like condition allows the use of "wild cards." As an example, to search for all Decal IDs, starting with DT, use "Like 'DT%'". The '%' means any number of characters of any type are allowed; therefore, "Like 'DT%'" means find everything starting with 'DT' followed by any number of characters, including nothing. Another "wild card" is the underscore "_". A condition such as "Like 'D_001ML'" would find 'DC001ML' and 'DT001ML.' The underscore "_" is a "wild card" for one space.

**Sort** - If no sort field is specified, the data will be displayed as retrieved from the data base. For most queries, this will have a random appearance and be hard to use. By moving to the sort box, you can either type in a field for sorting or use the show List command to select a field from those available. You can also specify ascending or descending order.

### 5.5 Creating Queries

Creating a new query uses many of the ideas demonstrated in the previous section on Modifying Existing Queries. To build a new query, select **Create** from the Action Menu. At this point you will see a blank screen for selection of Tables, Columns, Conditions, and Sorting (see Figure 7 below).

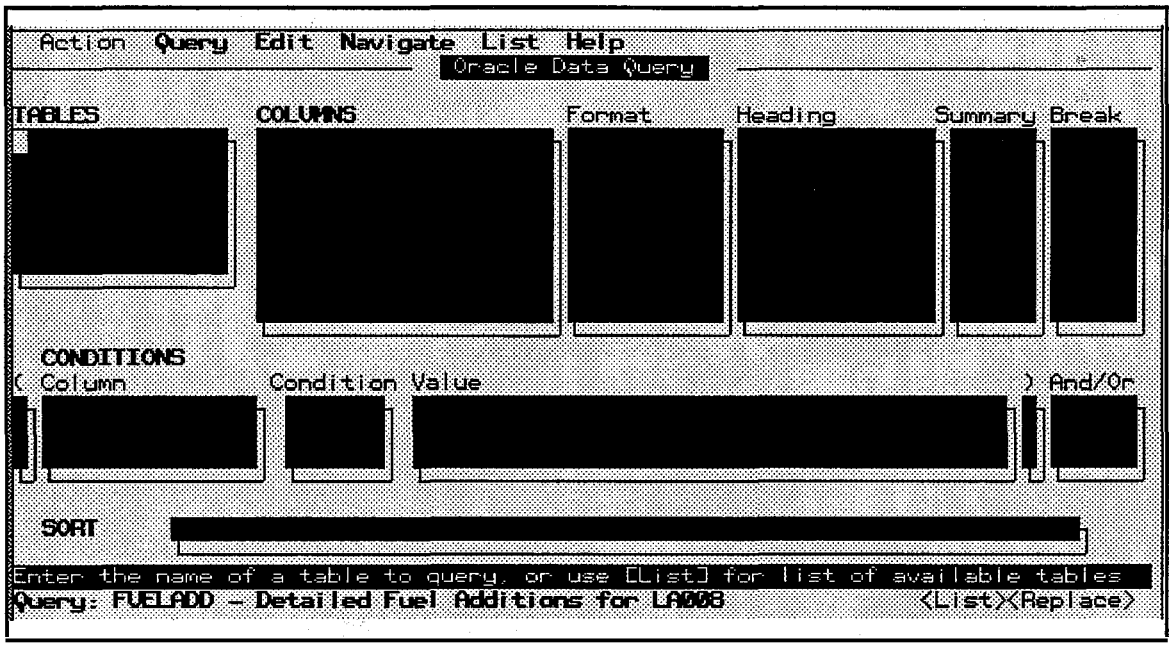


*Figure 7. Create Query Blank Screen*

**Create Example** - We will display all fuel add records for the vehicle "LA008" from January 1, 1992 through the present. To do this we will need to Join two tables: LDV_VEH and LDV_FUEL_ADD. This is necessary because the LDV_FUEL ADD table contains the VIN for vehicle identification and we want to specify Decal ID. The LDV_VEH table contains the bridge or Join between VIN and DECAL_ID.

You begin in the Tables section. To select tables, either type in their names, one per line, or do a show List command. From the show List (see Figure 8), select the tables of interest by moving to the Table name and pressing **Enter**. An asterisk will appear next to the selected table(see Figure 8). The tables can be deselected by the same method.

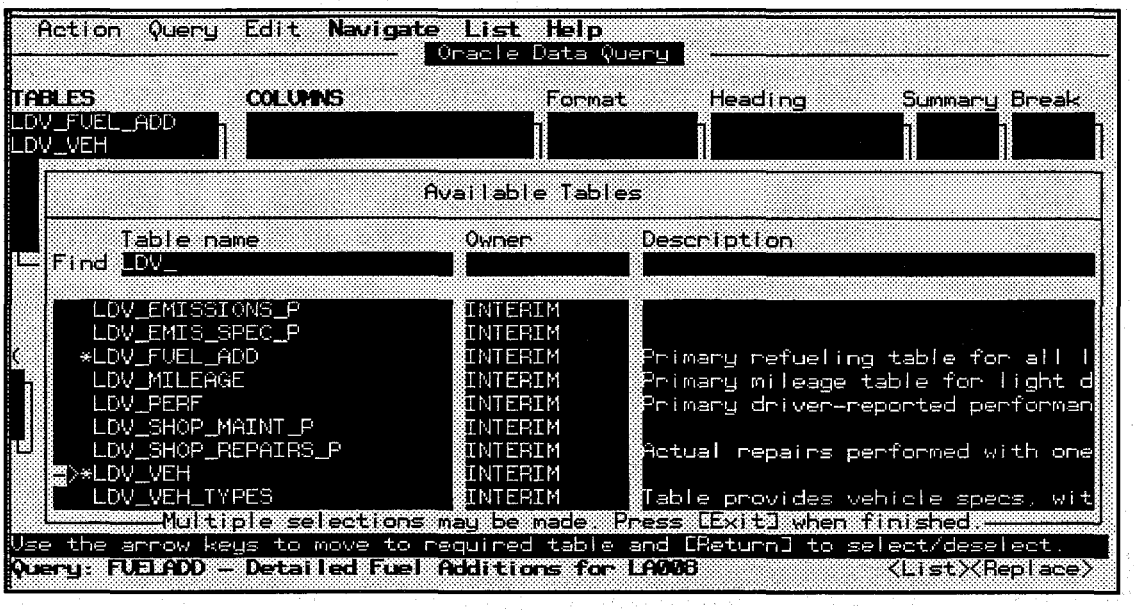


*Figure 8. Create Query Show List, Selecting LDV_VEH and Fuel Add*

Once selected, use the **Do** (F3) key to continue. You will notice that the program automatically writes in the names of the tables selected into the Query Create Tables screen. To move on, press **Enter**. A Join Conditions screen will display. The two tables are Joined by VIN. That is, both tables use VIN to describe the vehicle on all records in the data base (see Section 6 on the Data Base Road Map). In the Join Condition screen, type the following (or use show List key): first Table is LDV_VEH and first column is VIN; this equals (=) second Table LDV_FUEL_ADD and second column is VIN (see Figure 9 below). Press the **Do** (F3) key to return to the original Create screen.

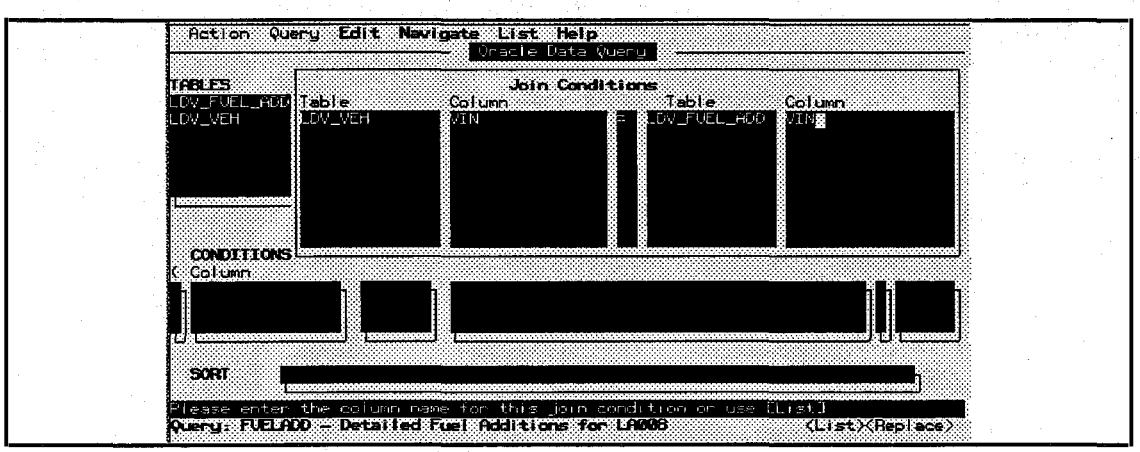


*Figure 9. Join Condition with values selected*

After completing the Join, you will be placed in the Columns section. Here you can select the columns from the two tables that you would like to display. Again, the names can either be typed or selected from the show List function. If you plan to select a large number of columns, it is usually easier to select from the show List. To select from the show List, move to the desired name and press **Enter**. You will notice that it is immediately added to the original screen, complete with format and column heading. Move through the list and select all of the columns of interest. Notice that each field or column has a description to aid the user (see Figure 10). Remember that the order selected is the order they will be displayed in the report. Additionally, the column names in the show List are listed alphabetically for each table (the fourth field in the List is the sequential number of the selected table).

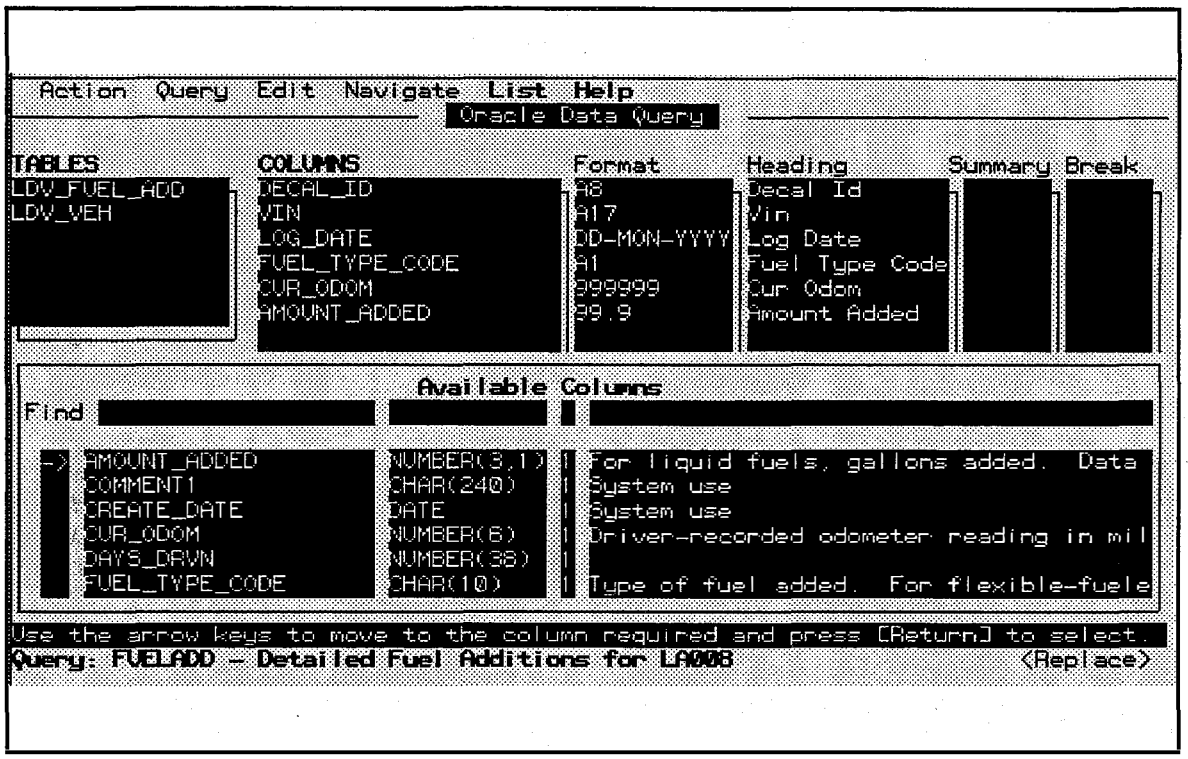


*Figure 10. Show List for Column Selection*

Once all columns have been selected, press **Do** (F3) and return to the Columns section. At this point, you can use the arrow and tab keys to move around the Columns section and modify formats and headings. The headings default to the column names, and you may wish to use a more descriptive heading. If you wish to create a multi-line header, separate the lines in the header by vertical bars (|). Pressing **Enter** on a blank row will move you to the Conditions section (you can also use the Menu, Navigate, Condition command).

In the Conditions section, specify a particular vehicle for a specific date range. Start out by entering the column name as DECAL_ID (you can also use the show List). Use the Like condition because we know the first part of the Decal_ID 'LA008,' but not the ending. It could end in 'GT',' MT', 'LT', etc. A show List can

also be used to select the Condition. Finally, for this Condition, specify the Value as 'LA008%.' Notice it is in quotes and the % indicates that any ending is acceptable. Move through the AND by pressing **Enter**In the next Column location, enter LOG_DATE, Condition > (greater than), Value '01-JAN-92.' This will select all dates past January 1, 1992. Do not be concerned with the trailing AND (see Figure 11).

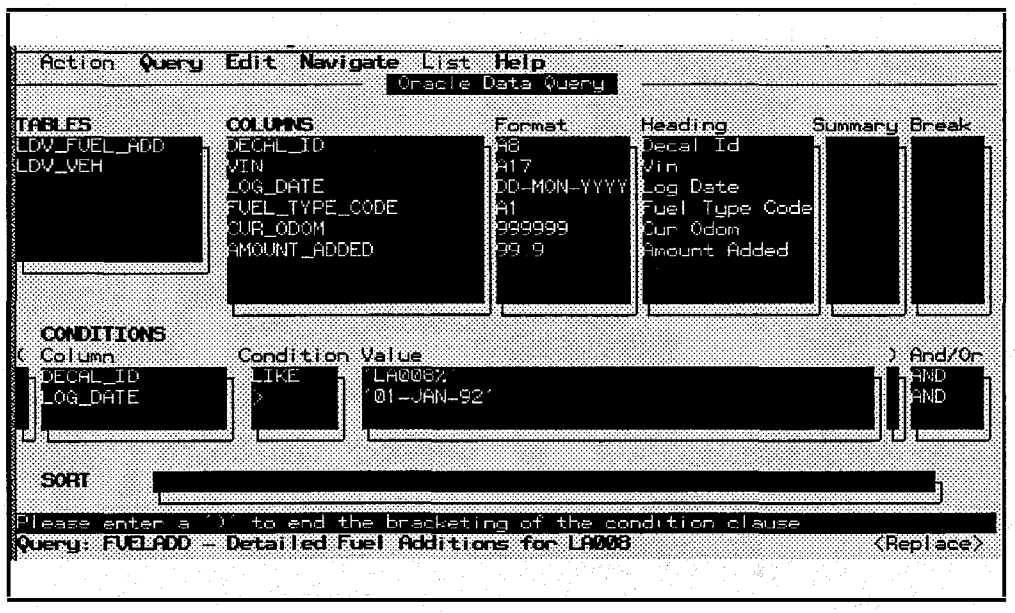


*Figure 11. Completed Condition Section*

Press **Enter** until you are moved to the Sort section. The sort condition of LOG_DATE should be specified, accepting the ascending sort order. Pressing **Enter** a few more times moves you to the Table section near the top of the screen (see Figure 12).

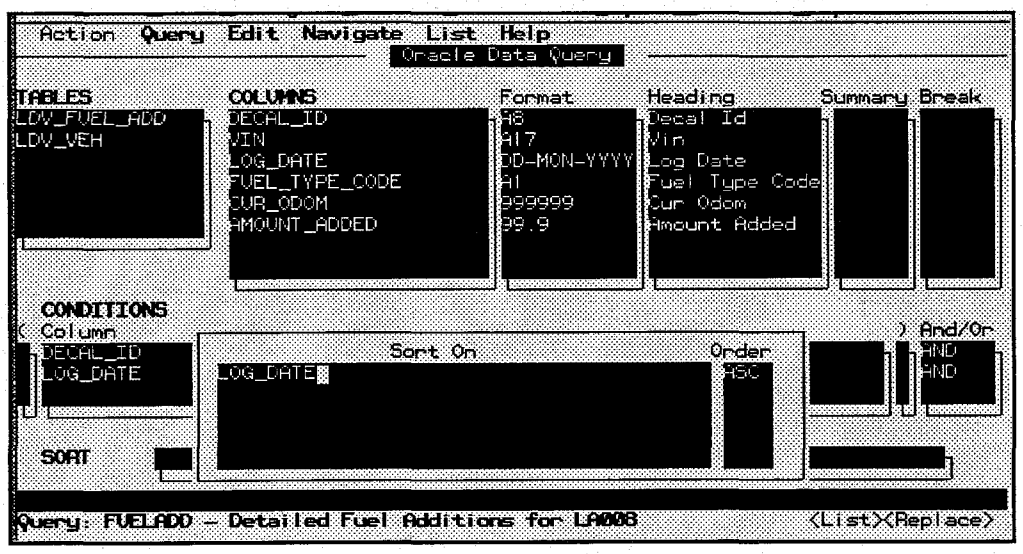


*Figure 12. Screen showing sort condition*

At this point, you could modify any section just as you would if modifying an existing query, or you can execute the query with the Do key (F3). "Working . . ." will be displayed in the bottom light bar while the query is executing. Finally, the Results screen that you have seen before will be displayed.

```
Down  Up  Left  Right  Top  Bottom  Print  Other-Runs  Save  Help  Quit
                Oracle Data Query Results Browser

Decal Id Vin                 Log Date    Fuel Type Code Cur Odom Amount Added
LA008MT  1FACP50U4MA151437 06-JAN-1992 M                 5126        20.6
LA008MT  1FACP50U4MA151437 14-JAN-1992 M                 5216         8.2
LA008MT  1FACP50U4MA151437 23-JAN-1992 M                 5446        17.0
LA008MT  1FACP50U4MA151437 28-JAN-1992 M                 5545         9.5
LA008MT  1FACP50U4MA151437 04-FEB-1992 M                 5638         7.7
LA008MT  1FACP50U4MA151437 11-FEB-1992 M                 5848        14.4
LA008MT  1FACP50U4MA151437 21-FEB-1992 M                 5988        13.8
LA008MT  1FACP50U4MA151437 28-FEB-1992 M                 6091         7.5
LA008MT  1FACP50U4MA151437 04-MAR-1992 M                 6190         8.2
LA008MT  1FACP50U4MA151437 12-MAR-1992 M                 6315        10.0
LA008MT  1FACP50U4MA151437 19-MAR-1992 M                 6541        18.7
LA008MT  1FACP50U4MA151437 24-MAR-1992 M                 6659         8.1
LA008MT  1FACP50U4MA151437 02-APR-1992 M                 6860         7.7

File 03078.LIS        Run on 12-NOV-1994 15:21        Screen 1 of 3
Show the next page of output
Query: FUELADD - Detailed Fuel Additions for LA008                <Replace>
```

*Figure 13. Results of Query*

After viewing the results, you can go back to make modifications or return to the Action Menu using the Exit key. Once the query meets your specifications, you can save it by doing **Menu/Query/Save** and **Exit**. This will now allow you to re-execute the query, modify the query, or export the output of the query at a later time.

### 5.6 Exporting to Lotus Worksheets

Another important feature of this software is the ability to save the results to a PC-compatible worksheet file. From the Action Menu, select **Export**; an options screen will be displayed. Select 'WKS'. An Export screen is shown from which you must select the query to be exported and the name of the exported file. Once this is completed, press **Enter** and the query will execute immediately. If you press **Do** (F3), you must tell it that you want the query to run immediately.

The result is a *.WKS file on the AFDC computer that must now be downloaded to your local PC (see Section 7.0 on downloading).

## 6.0 Important Information

**Road Map** - Appendix 1 contains a color-coded diagram showing the main data base tables and fields in those tables. The various tables are grouped together (by their color border) by the type of data. Examples of this grouping are driver-reported data, emissions data, maintenance data, etc. More importantly, the color bars on the diagram indicate how fields in different tables may be linked together. As an example, the LDV_VEH table (containing infomation on every vehicle) can be linked to the LDV_VEH_TYPES table (where common vehicle

specifications are stored) using the common field VEHICLE_TYPE_CODE. These two fields have a common color bar. Many fields in the Tables are codes that can be looked up in the AFDC_CODES table and are marked by a dark blue bar and a note[1].

Additional pages repeat the Road Map in black and white and include the descriptions of each field. These are the same field descriptions that you will see on-line in Data Query.

**Key Description** - For your convenience, the Oracle Data Query assigned keys for a commonly used VT100 or VT100 emulator are attached in Appendix 2. This is the same display that is available on-line in Data Query under the show Keys function. Generally, the VT100 function keys (e.g., **PF1**) are mapped to the PC keyboard function keys (e.g., **F1**).

**Special Considerations for Windows Terminal** - The terminal emulation program bundled with Microsoft Windows can be used as a VT100 emulator for accessing Data Query. Several parameters need to be set to ensure proper operation. These include the following:

Under Settings, Communication...

| | |
|---|---|
| Baud Rate | Baud Rate of your modem (e.g. 2400) |
| Data Bits | 8 |
| Stop Bits | 1 |
| Parity | None |
| Flow Control | Xon/Xoff |
| Connector | Port to which your modem is connected (e.g., COM1) |
| Parity Check | Not Needed |
| Carrier Detect | Not Needed |

Under Settings, Terminal Emulation...

DEC VT-100 (ANSI)

Under Settings, Terminal Preferences...

Function, Arrow, and Control keys for Windows SHOULD NOT BE CHECKED. These keys will be needed by Data Query, and if this box is checked, they will not be available.

**Oracle Reference** -Three reference books are available from Oracle that may be of help to AFDC Data Query Users. These books can be purchased directly from Oracle:

*Oracle Data Query User's Guide and Tutorial, Version 3.0*
Part Number 6551-30-0492
approximately $75

*SQL*PLUS User's Guide and Reference, Version 3.0*
Part Number 5142-V3.0 0691
approximately $65

*Introduction to SQL*
Part Number 19464-0489
approximately $20

Oracle Corporation
300 Oracle Parkway
Redwood Shores, CA 94065
(415) 506-7000

## 7.0 Downloading Reports from the AFDC

As mentioned above, all reports generated by AFDC/Menu are stored on the AFDC computer in each user's directory. There are two systems for downloading these files, depending on whether you are using Internet or a dial-in modem. If using Internet, use the File Transfer Protocol (FTP) command to retrieve the file; otherwise, use the AFDC download command.

### 7.1 Internet FTP

To use FTP, you need to connect to your home computer from AFDC and use the **put** or **mput** commands. From the go menu (while connected via telnet to AFDC), select **option 5) FTP.**

The computer will respond with the ftp prompt. At this point, you need to connect to your computer, using its Internet address:

*ftp>* **open yourcomp.home.com**

*Connected to yourcomp.home.com*
*yourcomp FTP server (SunOS 4.1) ready.*
*Name (yourcomp.home.com:(null))*: **signon**
*Password:* **yourpassword**
*User signon logged in.*
*ftp>*

If you like, you can display a directory on the AFDC computer by using the **!ls** command. To display all of the files generated from Data Query, issue the following command:

ftp> **!ls *.dat**

| | | | | |
|---|---|---|---|---|
| *111_1.dat* | *118_6.dat* | *148_1.dat* | *248_1.dat* | *3241_1.dat* |
| *111_2.dat* | *118_7.dat* | *148_2.dat* | *249_1.dat* | *3251_1.dat* |
| *111_3.dat* | *118_8.dat* | *191_1.dat* | *251_1.dat* | *451_1.dat* |

This displays a list of all the *.dat files in your AFDC directory. To actually transfer the files from the AFDC computer to your computer, use the **mput** or **put** commands. The ftp system defaults to standard ASCII text file transfers. Files generated with Data Query can be ASCII text or binary(*.wks). For binary files (see example below using files from the system download), use the binary command:

*ftp>* **put 111_1.dat**
*200 PORT command successful.*
*150 ASCII data connection for 111_1.dat (192.48.125.16,1243).*
*226 ASCII Transfer complete.*
*local: 111_1.dat remote: 111_1.dat*
*5676 bytes sent in 0.011 seconds (5e+02 Kbytes/s)*

In this case, 111_1.dat is an output file generated from Data Query. To send several files with one command, use the **mput** command with a file name and wild card:

*ftp>* **mput 111*.dat**
*mput 111_1.dat?* **y**
*200 PORT command successful.*
*150 ASCII data connection for 111_1.dat (192.48.125.16,1244).*
*226 ASCII Transfer complete.*
*local: 111_1.dat remote: 111_1.dat*
*5676 bytes sent in 0.0092 seconds (6.1e+02 Kbytes/s)*
*mput 111_2.dat?* **y**
*200 PORT command successful.*
*150 ASCII data connection for 111_2.dat (192.48.125.16,1245).*
*226 ASCII Transfer complete.*
*local: 111_2.dat remote: 111_2.dat*
*3532 bytes sent in 0.0065 seconds (5.3e+02 Kbytes/s)*
*mput 111_3.dat?* **y**
*200 PORT command successful.*
*150 ASCII data connection for 111_3.dat (192.48.125.16,1246).*
*226 ASCII Transfer complete.*
*local: 111_3.dat remote: 111_3.dat*
*3342 bytes sent in 0.024 seconds (1.3e+02 Kbytes/s)*
*ftp>*

The **mput** command transferred three files: 111_1.dat, 111_2.dat, 111_3.dat.

In addition to transferring files you have generated in your own directory, you can also transfer system files. To transfer these files back to your computer, you need to move to the download directory using the local change directory command, **lcd:**.

*ftp>* **lcd /home/afdc2/users/download**
*Local directory now /var/spool/ftp/pub/download*

To view the directory of files available in the download directory, use the **!ls** command:

*ftp>* **!ls**
*afdcmenu.txt e85all.exe l_all.exe viewhelp.exe viewwin.exe*
*contents e85spec.exe l_ftp.exe viewtool.exe viewzip.exe*

Before transferring any system file, change the file transfer file format to binary because most of the system files are stored as self-extracting zip files. Use the **binary** command:

*ftp>* **binary**
*200 Type set to I.*

Finally, use the **put** command, as above, to transfer any of the files.

*ftp>* **put l_all.exe**
*200 PORT command successful.*
*150 Binary data connection for l_all.exe (192.48.125.16,1211).*
*226 Binary transfer complete.*
*local: l_all.exe remote: l_all.exe*
*93397 bytes sent in 0.074 seconds (1.2e+03 Kbytes/s)*

To return to your root directory from the download directory, use the **lcd** command again. This time lcd moves you to your root directory:

*ftp>* **lcd userid**
where **userid** is your AFDC user ID

To leave ftp and return to the go menu, use the **bye** command
where userid is your AFDC logon:

*ftp>* **bye**
*Goodbye*
*afdc>*

### 7.2 Modem Download

If you are connecting to the AFDC computer via dial-up modem, you can download the files generated by AFDC/Menu or a variety of system files using the AFDC download command. This command allows you to select the file transfer protocol from four types currently available. The available formats includ:

*Kermit*
*Xmodem*
*Ymodem (batch)*
*Zmodem*

The download command also allows you to see a detailed list of files including the file name, date, and file description from the first line of the file. To use the command, select option **4) Download**, from the "go" menu.

From the first screen, select **1. Transfer a file** (see Figure 14).

```
+-------------------------------------------------------------------------------+
|                                                                               |
|                        Choose from the following:                             |
|                                                                               |
|                        1. Transfer a file                                     |
|                        2. Quit                                                |
|                                                                               |
|                        Choice: 1                                              |
|                                                                               |
+-------------------------------------------------------------------------------+
```

***Figure 14. Download Opening Screen***

From the next screen, select a file transfer protocol. Kermit and Xmodem are available in the MS Windows Terminal program. If available on your PC, Xmodem is faster than Kermit. It is not recommended that Kermit be used for downloading system files. Most of these files have been compressed with PKZIP. If they are downloaded, you will need to run pkzipfix, a program from PKWare to allow them to be used. For this example, select **2. Xmodem** (see Figure 15).

```
+-----------------------------------------------------------------------------------------+
|                    Choose a utility to transfer the file                                |
|                                                                                         |
|                 1. Kermit (not recommended for download of system files                 |
|                 2. Xmodem                                                               |
|                 3. Xmodem (Batch)                                                       |
|                 4. Zmodem                                                               |
|                                                                                         |
|                   Choice: 2                                                             |
+-----------------------------------------------------------------------------------------+
```

***Figure 15. File Transfer Protocol Selection***

Now you have the option of downloading or viewing a list of the available HOME (AFDC/Menu) files or SYSTEM files (AFDC/View updates, packages of data, this documentation, etc.). First, select **1. View detailed listing of SYSTEM files** (see Figure 16).

```
+-----------------------------------------------------------------------------------------+
|                 1. View detailed listing of SYSTEM files                                |
|                 2. View detailed listing of HOME files                                  |
|                 3. Download a SYSTEM file                                               |
|                 4. Download a HOME file                                                 |
|                 5. Quit                                                                 |
|                                                                                         |
|                 Choice: 1                                                               |
+-----------------------------------------------------------------------------------------+
```

***Figure 16. Download Options Selection, 1. View detailed listing of SYSTEM files.***

Option 1 above results in a description of the available system files, showing the size of each file and its name (see Figure 17).

```
+-----------------------------------------------------------------------------------------+
|Files available for Downloading...                                                       |
|Formats, ASCII, XLS-Excel, BIN-executable code                                           |
|File Name   Size(B)  Date   Description                                                  |
|-----------------------------------------------------------------------------------------|
|l_all.exe  93397  Jul 8  All emissions data on '91 Luminas (self extract)XLS             |
|l_ftp.exe  59804  Jul 8  FTP emissions data on '91 Luminas (self extract)XLS             |
|e85spec.exe 103559 Jul 11 E85 Lumina Speciated Emissions (self extract)  XLS             |
|e85all.exe   41789 Jul 11 E85 Lumina FTP emissions (self extract)        XLS             |
|viewwin.exe 694621 Jul 26 Install disk for AFDC/View 2.00 (self extract) BIN             |
|view200.exe 464003 Jul 26 AFDC/View 2.00 without Install program         BIN             |
|update1.exe  27000 Aug 3  Updated Icon Map & Pick List for AFDC/View 2.0 BIN             |
|                                                                                         |
|Press the Return key to continue...                                                      |
+-----------------------------------------------------------------------------------------+
```

***Figure 17. Detailed listing of SYSTEM files, Result***

To download a SYSTEM file, select **3. Download a SYSTEM file** (see Figure 18).

```
+-----------------------------------------------------------------------------------------------------+
|                                                                                                     |
|                    1. View detailed listing of SYSTEM files                                         |
|                    2. View detailed listing of HOME files                                           |
|                    3. Download a SYSTEM file                                                        |
|                    4. Download a HOME file                                                          |
|                    5. Quit                                                                          |
|                                                                                                     |
|                    Choice: 3                                                                        |
+-----------------------------------------------------------------------------------------------------+
```

***Figure 18. Download Options Selection, 3. Download a SYSTEM file***

You will then be asked to supply the name of the file to be downloaded (note: the available files are given at the top of the screen). Before typing the name of the file to be transferred, it is a good idea to verify that your communications program is set to the proper BINARY transfer protocol. As an example, with the Windows Terminal program, select ***Settings, Binary Transfers*** ... and select ***Xmodem.*** Then type in the name of the file to be transferred, e.g. **update1.exe** (see Figure 19).

```
+-------------------------------------------------------------------------------------------------------------+
|contents      e85spec.exe    l_ftp.exe      view200.exe
|e85all.exe    l all.exe      update1.exe    viewwin.exe
|
| Input file name to be sent or   Q to quit..
|update1.exe
|.
|Execute a RECEIVE BINARY on your PC using XMODEM
|
|XMODEM Version 3.9(November 1990)- UNIX-Microcomputer File Transfer Facility
|File /home/afdc2/users/download/update1.exe Ready to SEND in binary mode
|Estimated File Size 27K, 209 Sectors, 26739 Bytes
|Estimated transmission time 4 minutes 8 seconds
|Send several Control-X characters to cancel
|[jump back to your PC and issue the RECEIVE BINARY COMMAND]
|Press any key to continue
+-------------------------------------------------------------------------------------------------------------+
```

***Figure 19. Example of downloading a SYSTEM file***

After you have typed the name of the file to be transferred and pressed **return**, the AFDC computer will respond with the above statement. At this point, return to your communications program and select ***RECEIVE BINARY***. In the Windows Terminal Program, select ***Transfers, Receive Binary File***.. and give the PC a name for the incoming file, usually the same name that appears on the AFDC computer, e.g., update1.exe. The file will now be transferred to your PC. When the transfer is completed, you will get the *Press any key to continue* comment. After pressing a key, you will be returned to the options selection screen generated by AFDC/Menu. Option **2. View detailed listing of HOME files** displays files.

Finally, if you would like to download a file from your HOME directory, select option **4. Download a HOME file** (see Figure 20).

```
+-----------------------------------------------------------------------------------------------------------+
|                                                                                                           |
|                    1. View detailed listing of SYSTEM files                                               |
|                    2. View detailed listing of HOME files                                                 |
|                    3. Download a SYSTEM file                                                              |
|                    4. Download a HOME file                                                                |
|                    5. Quit                                                                                |
|                                                                                                           |
|                    Choice: 4                                                                              |
+-----------------------------------------------------------------------------------------------------------+
```

***Figure 20. Download Options Selection, 4. Download a HOME file***

The system will show you a short list of all the HOME, *.dat and *.wks files and ask you to enter a file name to be downloaded (sorry, wild cards are not yet accepted). In this case, select **3112_1.dat** (see Figure 21).

```
+-----------------------------------------------------------------------------------------------------------+
|3112_1.dat    3141_1.dat    3163_1.dat    3173_1.dat    3181_1.dat                                         |
|3131_1.dat    3142_1.dat    3164_1.dat    3174_1.dat                                                       |
|3132_1.dat    3143_1.dat    3165_1.dat    3175_1.dat                                                       |
|3133_1.dat    3151_1.dat    3171_1.dat    3176_1.dat                                                       |
|3134_1.dat    3162_1.dat    3172_1.dat    3177_1.dat                                                       |
|                                                                                                           |
|Input file name to be sent or Q to quit..                                                                  |
|3112_1.dat                                                                                                 |
|                                                                                                           |
|Execute a RECEIVE BINARY on your PC using Xmodem                                                           |
|                                                                                                           |
|XMODEM Version 3.9(November 1990)- UNIX-Microcomputer File Transfer Facility                               |
|File 3112_1.dat Ready to SEND in binary mode                                                               |
|Estimated File Size 10K, 76 Sectors, 9708 Bytes                                                            |
|Estimated transmission time 1 minute  31 seconds                                                           |
|Send several Control-X characters to cancel                                                                |
|[jump back to your PC and issue the RECEIVE BINARY COMMAND]                                                |
|Press any to continue                                                                                      |
+-----------------------------------------------------------------------------------------------------------+
```

***Figure 21. Example of downloading a HOME file***

As with any modem download on the AFDC system, you must jump back to your local PC and issue a RECEIVE BINARY command, making sure that your PC is set up with the same file transfer protocol as you selected in the AFDC download program.

After returning to the options screen, select **5. Quit** to return to the AFDC prompt (see Figure 22).

```
+-----------------------------------------------------------------------------------------------------------+
|                    1. View detailed listing of SYSTEM files                                               |
|                    2. View detailed listing of HOME files                                                 |
|                    3. Download a SYSTEM file                                                              |
|                    4. Download a HOME file                                                                |
|                    5. Quit                                                                                |
|                                                                                                           |
|                      Choice: 5                                                                            |
|afdc>
+-----------------------------------------------------------------------------------------------------------+
```

*Figure 22. Download Options Selection, 5. Quit*

## 8.0 Example Query Detailed Explanations

This section describes the example queries that are available to all users as public queries. As public queries, they are Run only. Some are set to retrieve data for an arbitrarily selected vehicle or time period. To change the vehicle or time period being selected, please refer to Sections 5.2, 5.3, and 5.4 on Running, Copying, and Modifying Queries.

The queries are stored by the simple name EXAMPLE#, where # is a number from 1 to 8. The following explanations include the same name and title used in the Data Query listing.

**EXAMPLE1 - Gallons of M85 Consumed in Detroit**

This query uses the LDV_VEH and LDV_FUEL_ADD tables to calculate the monthly amount of M85 fuel used by all vehicles in the Detroit location. It utilizes the JOIN on VIN between the two tables. The condition operator, LIKE, is used with the DECAL_ID to specify the Detroit site, and the SQL, TO_CHAR function is used to convert the daily dates to months. The SUM function is also necessary to get the total amount per month.

**EXAMPLE2 - Individual Refueling Occurrences**

This query uses the LDV_VEH and LDV_FUEL_ADD tables to generate a report of all refueling occurrences for a particular vehicle. Information is selected from the LDV_FUEL_ADD table without additional functions. A Condition is set to retrieve data on a particular vehicle. By JOINing with the LDV_VEH table, the vehicle can be selected by DECAL_ID rather than VIN.

**EXAMPLE3 - Summary Emissions**

This query selects summary emissions information from the EMIS_SUM table. The EMIS_SUM table contains averages of all the tests performed on various vehicle types at specific mileages. By using the Condition statements, only data on Luminas and the emission gases NOx, CO, and THC are retrieved.

**EXAMPLE4 - Monthly Mileage for Luminas at a Site**

Monthly mileage data is selected from the LDV_MILEAGE and LDV_VEH tables. A particular site is identified by selecting the first two characters of the DECAL_ID using the SUBSTR function. . To get monthly data, the LOG_DATE, normally a daily date, is converted to a monthly date using the TO_CHAR (notice that the format is YY-MM; this will sort properly while MM-YY will not). In addition to getting

the monthly date, you need to determine how many miles were driven each day and use the SUM function to get the mileage for the month. To get the miles driven per day, use the difference between END_ODOM and BEGIN_ODOM.

To get data only for Luminas, the Condition is set for the 7th character of the DECAL_ID to be 'L'. To further limit the amount of data retrieved, only data from the Argonne site are retrieved by setting the first two characters of DECAL_ID to 'AR'.

**EXAMPLE5 - Detailed Maintenance by Vehicle**

All of the maintenance records of a specific vehicle are retrieved. To accomplish this, three tables must be joined, LDV_SHOP_MAINT, LDV_SHOP_REPAIRS, and AFDC_CODES. By JOINing the LDV_SHOP_MAINT and LDV_SHOP_REPAIRS by MAINT_NUM, the detailed repairs can be retrieved for a specific vehicle. In general, several fields describing the repair are selected from the two maintenance tables. The best description of the repair is in the CPSC_REPAIR_CODE. However, this is a numeric code and has little value to most users. This code can be decoded using the AFDC_CODES table. By selecting the CODE_DESC from the AFDC_CODES table and adding the JOIN condition (CPSC_REPAIR_CODE equals the CODE_VAL from the codes table and CODE_TYPE equals 'CPSC_REPAIR_CODE'), the proper description of each repair will be retrieved.

**EXAMPLE6 - Detailed Weighted FTP Emissions**

All weighted results of the FTP test for a specific vehicle can be retrieved using the LDV_EMISSIONS view. This view contains all of the various measured gases as columns and also includes the vehicle DECAL_ID and detailed test conditions.

By selecting various fields of interest from the LDV_EMISSIONS view and specifying that the DECAL_ID be a specific vehicle (TEST_TYPE_CODE to be FTP and 'BAG_ID' to be 'WT') the FTP weighted results will be returned.

**EXAMPLE7 - CNG Fuel Analysis**

This is the most complicated example given because it makes extensive use of the DECODE function. The objective is to return CNG fuel analysis contained in two data base tables as a report with analysis components as columns. By using the SUM and DECODE functions, you can look for COMPONENT_TYPE_CODE equal to a specific value, such as CH4%. If it is, then SUM the COMPONENT_AMT. If not, add a 0. This will give you the values you want because there is only one COMPONENT_TYPE_CODE equal to CH4% for the specific SITE_NAME and SAMPLE_DATE. This method will, however, return a zero if no values are present for that component. If you think there is a second sample on the same day at the same site, select another field that would make each record unique.

You must also specify that you want only CNG data (FLUID_TYPE_CODE) as well as the JOIN condition between FLUID_SAMPLES and FLUID_ANALYSIS_DATA (SAMPLE_ID).

**EXAMPLE8 - Used Lube Oil Analysis**

This is another way to retrieve data from the FLUID_SAMPLES and FLUID_ANALYSIS_DATA tables. By specifying the JOIN condition as in EXAMPLE7 and a JOIN to LDV_VEH table using VIN, data fields can be selected that describe the data measured on oil samples from a specific vehicle. The vehicle DECAL_ID must be specified and the COMPONENT_TYPE_CODE must be set to 'LUBEOIL'.

Because you select COMPONENT_TYPE_CODE, the report will display a column of components and a column of amounts (COMPONENT_AMT) rather than a single column for each component, as was done in EXAMPLE7.

# APPENDIX 1

## Road Maps

Light-Duty Vehicles
Transit Buses
Clean Fleet, Federal Express
Heavy-Duty Trucks
Heavy-Duty Emissions

# APPENDIX 2

## Data Query VT-100 Keyboard Layout

VT100 Keyboard for Oracle Data Query

| | | | |
|---|---|---|---|
| Do | PF3<br>^T | Insert/Replace | ^A |
| | | Left | Left |
| Beginning of Line | PF1 PF1 Left | List | KP- .<br>^F |
| First Line | PF1 PF1 Up | | |
| Show the SQL | PF1 KP- 0 | Main Menu | PF1 PF1 KP- 2 |
| Clear End-of-Line | PF1 PF1 KP- 3 | Menu | KP- 0<br>^G<br>^N |
| Clear Field | KP- 4 | | |
| Copy | PF1 KP- . | | |
| Cut | PF1 KP- 3 | Select/De-Select | Tab |
| Debug Mode | PF1 KP- 6 | Down | PF1 KP- - |
| Delete Backwards | Delete | Paste | PF1 KP- 2 |
| Delete Character | ^D | Previous Field | PF1 Return<br>PF1 Tab |
| Delete Line | PF1 Delete | | |
| Display Error | PF1 PF2 | Previous Menu | PF1 PF1 KP- 1 |
| Down | Down | Up | PF1 KP- 9 |
| Preview Format | PF1 PF1 PF2 | Print | ^P |
| Expand text | PF1 KP- 1 | Refresh | ^R |
| End of Line | PF1 PF1 Right | Return | Return |
| Last Line | PF1 PF1 Down | Right | Right |
| Enter >1 OS Command | KP- 7 | Scroll Down | PF1 Down |
| Enter Appl Params | PF1 PF1 KP- 5 | Scroll Left | PF1 Left |
| Show Related Tables | KP- 6 | Scroll Right | PF1 Right |
| List | KP- , | Scroll Up | PF1 Up |
| Exit | PF4<br>^B | Select | Enter<br>^V |
| Help | PF2<br>^W | Show Keys | ^K |
| | | Up | Up |

VT100 Keyboard for Oracle Data Query

| | |
|---|---|
| Do | PF3<br>^T |
| Clear Field | KP-4 |
| Copy | PF1 KP- . |
| Cut | PF1 KP-3 |
| Delete Backwards | Delete |
| Delete Character | ^D |
| Delete Line | PF1 Delete |
| Down | Down |
| Expand text | PF1 KP-1 |
| End of Line | PF1 PF1 Right |
| Last Line | PF1 PF1 Down |
| Exit | PF4<br>^B |
| Help | PF2<br>^W |

| | |
|---|---|
| Insert/Replace | ^A |
| Left | Left |
| List | KP- .<br>^F |
| Main Menu | PF1 PF1 KP-2 |
| Menu | KP-0<br>^G<br>^N |
| Down | PF1 KP- - |
| Paste | PF1 KP-2 |
| Previous Field | PF1 Return<br>PF1 Tab |
| Up | PF1 KP-9 |
| Return | Return |
| Right | Right |
| Scroll Down | PF1 Down |
| Scroll Left | PF1 Left |
| Scroll Right | PF1 Right |
| Scroll Up | PF1 Up |
| Select | Enter<br>^V |
| Show Keys | ^K |
| Up | Up |

# APPENDIX 3

## Data Query Examples

Outputs from Examples
SQL Generated from Examples

Gallons of M85 [illegible]med in Detroit
Example 1

| Month | Fuel Consumed, gal |
|---|---|
| 91-01 | 12.5 |
| 91-03 | 116.5 |
| 91-04 | 1087.2 |
| 91-05 | 1117.7 |
| 91-06 | 829.7 |
| 91-07 | 560.3 |
| 91-08 | 692.5 |
| 91-09 | 467.2 |
| 91-10 | 765.2 |
| 91-11 | 548.9 |
| 91-12 | 551.1 |
| 92-01 | 600.5 |
| 92-02 | 816.9 |
| 92-03 | 733.3 |
| 92-04 | 853.9 |
| 92-05 | 838.6 |
| 92-06 | 796.5 |
| 92-07 | 794.1 |
| 92-08 | 500.4 |
| 92-09 | 527.5 |
| 92-10 | 674.9 |
| 92-11 | 379.8 |
| 92-12 | 484.8 |
| 93-01 | 491.0 |
| 93-02 | 640.4 |
| 93-03 | 576.9 |
| 93-04 | 574.2 |
| 93-05 | 470.5 |
| 93-06 | 681.9 |
| 93-07 | 541.7 |
| 93-08 | 531.1 |
| 93-09 | 437.1 |
| 93-10 | 821.7 |
| 93-11 | 661.5 |
| 93-12 | 607.4 |
| 94-01 | 526.9 |
| 94-02 | 645.1 |
| 94-03 | 637.4 |
| 94-04 | 548.5 |
| 94-05 | 538.9 |
| 94-06 | 417.3 |
| 94-07 | 449.0 |
| 94-08 | 141.7 |

43 rows selected.

Individual Refueling Occurences
Example 2

| Log Date | Odometer | Fuel Type | Amount Added | Fuel Units |
|---|---|---|---|---|
| 16-09-91 | 2644 | M | 8.7 | GAL |
| 30-09-91 | 2799 | M | 12.4 | GAL |
| 25-10-91 | 2921 | M | 12.3 | GAL |
| 31-10-91 | 3087 | G | 8.9 | GAL |
| 06-11-91 | 3169 | M | 8.0 | GAL |
| 14-11-91 | 3334 | M | 11.3 | GAL |
| 26-11-91 | 3468 | M | 10.3 | GAL |
| 18-12-91 | 3573 | M | 9.8 | GAL |
| 24-12-91 | 3708 | M | 11.5 | GAL |
| 07-01-92 | 3868 | M | 13.3 | GAL |
| 21-01-92 | 3993 | M | 11.3 | GAL |
| 04-02-92 | 4133 | M | 12.0 | GAL |
| 05-02-92 | 4295 | G | 9.4 | GAL |
| 21-02-92 | 4528 | M | 12.4 | GAL |
| 04-03-92 | 4701 | M | 12.2 | GAL |
| 26-03-92 | 4852 | M | 12.2 | GAL |
| 03-06-93 | 10310 | M | 7.2 | GAL |
| 25-06-93 | 10639 | M | 7.4 | GAL |
| 13-07-93 | 10789 | M | 11.6 | GAL |
| 27-07-93 | 10991 | M | 14.1 | GAL |
| 06-08-93 | 11126 | M | 12.2 | GAL |
| 13-08-93 | 11209 | M | 7.1 | GAL |
| 14-09-93 | 11317 | M | 9.6 | GAL |
| 01-11-93 | 11506 | M | 16.0 | GAL |
| 16-11-93 | 11599 | M | 13.8 | GAL |
| 15-12-93 | 11815 | G | 14.9 | GAL |
| 17-02-94 | 12193 | G | 14.5 | GAL |
| 08-03-94 | 12260 | M | 4.0 | GAL |
| 16-03-94 | 12564 | M | 14.3 | GAL |
| 25-04-94 | 12742 | M | 12.2 | GAL |
| 04-05-94 | 12799 | M | 5.4 | GAL |
| 05-05-94 | 12960 | G | 5.2 | GAL |
| 06-05-94 | 13136 | M | 14.4 | GAL |
| 11-05-94 | 13395 | M | 13.2 | GAL |
| 06-06-94 | 13469 | M | 6.0 | GAL |
| 09-06-94 | 13635 | G | 8.5 | GAL |

36 rows selected.

Summary Emissions
For Chevrolet Luminas
Regulated Gases
Example 3

| Vehicle Type | Model Year | Aprox Odom | Fuel | Emission | Ave-StDev | Average | Ave+StDev | Units |
|---|---|---|---|---|---|---|---|---|
| CNTRL | 93 | 5000 | RFG | CO | 2.2845 | 3.0723 | 3.8601 | gm/mi |
| CNTRL | 93 | 10000 | RFG | CO | 2.0238 | 3.0311 | 4.0385 | gm/mi |
| FFV | 93 | 10000 | E50 | CO | 1.4264 | 3.0877 | 4.7490 | gm/mi |
| FFV | 93 | 10000 | E85 | CO | 1.8403 | 2.6232 | 3.4060 | gm/mi |
| FFV | 93 | 10000 | RFG | CO | 1.6496 | 2.2486 | 2.8476 | gm/mi |
| CNTRL | 93 | 5000 | RFG | NOx | .4068 | .5753 | .7439 | gm/mi |
| CNTRL | 93 | 10000 | RFG | NOx | .4383 | .5049 | .5714 | gm/mi |
| FFV | 93 | 10000 | E50 | NOx | .1042 | .1530 | .2017 | gm/mi |
| FFV | 93 | 10000 | E85 | NOx | .1116 | .1397 | .1678 | gm/mi |
| FFV | 93 | 10000 | RFG | NOx | .1848 | .2406 | .2963 | gm/mi |
| CNTRL | 93 | 5000 | RFG | THC | .1818 | .2040 | .2262 | gm/mi |
| CNTRL | 93 | 10000 | RFG | THC | .1855 | .2062 | .2270 | gm/mi |
| FFV | 93 | 10000 | E50 | THC | .1027 | .1425 | .1822 | gm/mi |
| FFV | 93 | 10000 | E85 | THC | .1327 | .1629 | .1931 | gm/mi |
| FFV | 93 | 10000 | RFG | THC | .1031 | .1185 | .1339 | gm/mi |

15 rows selected.

Monthly Mileages for Luminas at Each Site
Example 4

| Vehicle Location | Month | Monthly Mileage |
|---|---|---|
| AR | 92-08 | 896 |
| AR | 92-09 | 1788 |
| AR | 92-10 | 3802 |
| AR | 92-11 | 2581 |
| AR | 92-12 | 2591 |
| AR | 93-01 | 2698 |
| AR | 93-02 | 3208 |
| AR | 93-03 | 3824 |
| AR | 93-04 | 4641 |
| AR | 93-05 | 3536 |
| AR | 93-06 | 4472 |
| AR | 93-07 | 2232 |
| AR | 93-08 | 4731 |
| AR | 93-09 | 3335 |
| AR | 93-10 | 2966 |
| AR | 93-11 | 4258 |
| AR | 93-12 | 4629 |
| AR | 94-01 | 3364 |
| AR | 94-02 | 3970 |
| AR | 94-03 | 1826 |
| AR | 94-04 | 3251 |
| AR | 94-05 | 5290 |
| AR | 94-06 | 6227 |
| AR | 94-07 | 6384 |

24 rows selected.

Detailed Maintenance by Vehicle
Example 5

| Log Date | Odometer | Repair Description | Labor Cost | Repair Labor Hours | Parts Cost | Other Cost | Scheduled | Service Code | Total Cost | Warranty |
|---|---|---|---|---|---|---|---|---|---|---|
| 12-06-91 | 1658 | Instrument Cluster/Console Modules | 27.00 | .50 | .00 | .00 | N | RPL | 27.00 | Y |
| 05-08-91 | 2389 | Fuel Injection - Electrical Components | 135.00 | 2.50 | 748.80 | .00 | N | RPL | 883.80 | Y |
| 05-08-91 | 2389 | Low Fuel Warning Devices | 10.80 | .20 | 2.19 | .00 | N | RPL | 12.99 | Y |
| 27-09-91 | 2782 | Electric Fuel Pumps | .00 | .20 | .00 | .00 | N | RPL | .00 | Y |
| 27-09-91 | 2782 | Engine Lubricant | 13.00 | | 6.26 | 38.75 | Y | SM | 58.01 | N |
| 27-09-91 | 2782 | Fuel Injection - Electrical Components | .00 | 2.10 | .00 | .00 | N | RPL | .00 | Y |
| 20-10-91 | 2845 | Fuel Injection - Electrical Components | 388.80 | 7.20 | 176.31 | .00 | N | RPL | 565.11 | Y |
| 12-02-92 | 4503 | Engine Lubricant | 13.00 | | 6.26 | 38.50 | Y | SM | 57.76 | N |
| 12-02-92 | 4503 | Fuel Injection - Electrical Components | 123.90 | 2.10 | 162.24 | .00 | N | RPL | 286.14 | Y |
| 17-09-92 | 7087 | BODY SYSTEM | | | | .00 | N | RPR | 4.27 | N |
| 17-09-92 | 7087 | Engine Lubricant | | | | .00 | Y | SM | 65.26 | N |
| 17-09-92 | 7087 | SUSPENSION SYSTEM | | | | .00 | Y | SM | 15.79 | N |
| 12-11-92 | 7409 | Engine Lubricant | 13.00 | | 6.26 | 38.75 | Y | SM | 59.01 | N |
| 18-02-93 | 8991 | Engine Lubricant | | | | .00 | Y | SM | 56.95 | N |
| 09-06-93 | 10608 | Engine Lubricant | | | | .00 | Y | SM | 56.95 | N |
| 28-06-93 | 10668 | Engine Lubricant | 11.30 | | 5.90 | 39.75 | Y | SM | 56.95 | N |
| 18-08-93 | 11177 | Engine Lubricant | 11.30 | .50 | 5.90 | 39.75 | Y | SM | 56.95 | N |
| 13-11-93 | 11561 | Engine Lubricant | | | | .00 | N | SM | | Y |
| 13-11-93 | 11561 | Fuel Tank and Lines Subsystem | 82.60 | | 1090.96 | .00 | N | RPL | 1173.56 | Y |
| 05-03-94 | 12201 | Engine Lubricant | | | | .00 | Y | SM | 56.95 | N |

20 rows selected.

Detailed Weighted FTP Emissions
for a Specific Vehicle
DT004ML
Example 6

| Emis Lab | Test Fuel | Odometer | Date | CO | NOx | THC | OMHCE | NMHC | HCHO |
|---|---|---|---|---|---|---|---|---|---|
| EPA1 | INDOLENE | 1668 | 01-AUG-91 | 2.2230 | .1250 | .1830 | | | |
| EPA1 | INDOLENE | 4873 | 16-JAN-92 | 1.6323 | .4384 | .2100 | | | |
| EPA1 | INDOLENE | 11138 | 05-MAY-93 | 1.2800 | .7600 | .5140 | | | |
| EPA1 | INDOLENE | 11178 | 06-MAY-93 | 1.3100 | .6900 | .4040 | | | |
| EPA1 | INDOLENE | 12595 | 15-DEC-93 | 3.0990 | .2910 | .2440 | .2470 | .2020 | .0040 |
| EPA1 | INDOLENE | 12636 | 16-DEC-93 | 3.1710 | .2030 | .2440 | .2470 | .2040 | .0040 |
| EPA1 | M50 | 11284 | 12-MAY-93 | 1.2750 | .3960 | .2350 | .3390 | | .0157 |
| EPA1 | M50 | 11325 | 13-MAY-93 | 1.0640 | .4780 | .2600 | .3720 | | .0163 |
| EPA1 | M50 | 12777 | 21-DEC-93 | 3.1740 | .1910 | .1680 | .2000 | .1310 | .0140 |
| EPA1 | M50 | 12817 | 22-DEC-93 | 3.7290 | .1990 | .1820 | .2120 | .1420 | .0130 |
| EPA1 | M50 | 12858 | 23-DEC-93 | 3.6360 | .1660 | .1700 | .1970 | .1340 | .0120 |
| EPA1 | M85 | 1610 | 31-JUL-91 | 2.7610 | .0550 | .0690 | .1640 | | .0169 |
| EPA1 | M85 | 4921 | 17-JAN-92 | 2.8930 | .1930 | .0880 | .1580 | | .0132 |
| EPA1 | M85 | 11127 | 18-MAY-93 | 1.5330 | .2870 | .0770 | .1980 | | .0206 |
| EPA1 | M85 | 11418 | 20-MAY-93 | 3.7490 | .2840 | .0690 | .2160 | | .0192 |
| EPA1 | M85 | 11567 | 27-MAY-93 | 2.9700 | .2600 | .2160 | | | |
| EPA1 | M85 | 11680 | 29-JUN-93 | 1.0900 | .2600 | 1.0570 | | | |
| EPA1 | M85 | 11720 | 30-JUN-93 | 1.1400 | .3100 | .0820 | | | |
| EPA1 | M85 | 12934 | 29-DEC-93 | 2.8720 | .1590 | .0790 | .1650 | .0630 | .0240 |
| EPA1 | M85 | 12991 | 04-JAN-94 | 2.8720 | .1310 | .0720 | .1490 | .0560 | .0240 |

20 rows selected.

CNG Fuel Analysis
Example 7

| Site Name | Samp Date | Anal Date | CH4, mole% | C2H6, mole% | C3H8, mole% | I-C4, mole% | N-C4, mole% | I-C5, mole% | N-C5, mole% | C6, mole% | CO2, mole% | O2, mole% | N2, mole% | Heat Val, BTU/SCF |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Bakersfield | 04/16/93 | 05/11/93 | 93.450 | 3.780 | .630 | .050 | .060 | .020 | .020 | .030 | 1.140 | .010 | .820 | 1032.00 |
| Bakersfield | 04/20/93 | 05/11/93 | 93.350 | 3.820 | .690 | .070 | .070 | .020 | .020 | .030 | 1.020 | .000 | .920 | 1034.00 |
| Bakersfield | 06/02/93 | 06/16/93 | 94.810 | 2.210 | .520 | .060 | .090 | .030 | .030 | .100 | 1.540 | .020 | .600 | 1021.00 |
| Charleston | 07/19/93 | | 86.290 | 8.670 | 2.780 | .390 | .650 | .210 | .210 | .240 | .030 | .010 | .590 | 1154.00 |
| Charleston | 07/24/93 | | 91.040 | 5.910 | 1.180 | .110 | .180 | .050 | .050 | .150 | .700 | .010 | .630 | 1073.00 |
| Chicago | 02/05/93 | 03/30/93 | 93.590 | 2.880 | .440 | .060 | .090 | .030 | .030 | .110 | .620 | .020 | 2.140 | 1019.00 |
| Chicago | 03/05/93 | 03/30/93 | 92.820 | 3.220 | .510 | .070 | .100 | .030 | .030 | .050 | .650 | .020 | 2.510 | 1017.00 |
| Chicago | 04/06/93 | 04/28/93 | 93.700 | 3.170 | .550 | .070 | .100 | .030 | .030 | .050 | .590 | .010 | 1.700 | 1026.00 |
| Chicago | 05/05/93 | 06/02/93 | 91.750 | 3.370 | .530 | .070 | .090 | .030 | .030 | .040 | .670 | .020 | 3.410 | 1009.00 |
| Chicago | 08/02/93 | 09/03/93 | 93.460 | 3.480 | .340 | .030 | .040 | .010 | .010 | .020 | .690 | .040 | 1.880 | 1018.00 |
| Chicago | 09/24/93 | 10/18/93 | 92.780 | 3.550 | .350 | .030 | .050 | .020 | .020 | .030 | .670 | .020 | 2.490 | 1014.00 |
| Denver | 07/23/93 | | 77.530 | 9.710 | 1.760 | .160 | .220 | .040 | .040 | .070 | 2.690 | .440 | 7.350 | 1017.00 |
| El Paso | 02/25/93 | 03/30/93 | 93.800 | 3.140 | .580 | .060 | .110 | .040 | .040 | .060 | .450 | .010 | 1.720 | 1028.00 |
| El Paso | 03/26/93 | 04/28/93 | 92.570 | 3.290 | .590 | .070 | .110 | .030 | .030 | .100 | .640 | .000 | 2.570 | 1021.00 |
| El Paso | 04/29/93 | 06/03/93 | 93.500 | 3.210 | .620 | .070 | .120 | .040 | .040 | .100 | .650 | .020 | 1.640 | 1030.00 |
| El Paso | 05/26/93 | 06/03/93 | 93.700 | 3.050 | .540 | .050 | .090 | .030 | .030 | .100 | .660 | .020 | 1.740 | 1025.00 |
| El Paso | 07/30/93 | | 93.590 | 3.000 | .550 | .070 | .120 | .040 | .040 | .120 | .650 | .020 | 1.810 | 1026.00 |
| El Paso | 09/29/93 | 12/07/93 | 93.510 | 3.170 | .650 | .090 | .140 | .040 | .040 | .070 | .610 | .010 | 1.680 | 1030.00 |
| Houston | 01/31/94 | 02/10/94 | 94.740 | 2.840 | .350 | .060 | .070 | .030 | .030 | .100 | 1.340 | .020 | .430 | 1027.00 |
| Houston | 02/12/94 | 02/25/94 | 94.840 | 2.570 | .460 | .130 | .150 | .060 | .060 | .190 | 1.110 | .010 | .430 | 1037.00 |
| Miami | 02/19/93 | 04/28/93 | 93.280 | 2.670 | .330 | .080 | .080 | .030 | .030 | .200 | .990 | .210 | 2.110 | 1014.00 |
| Morgantown | 09/10/93 | 10/18/93 | 92.910 | 4.460 | .760 | .120 | .160 | .070 | .070 | .150 | .640 | .010 | .670 | 1057.00 |
| New York | 11/02/93 | 12/07/93 | 190.810 | 4.800 | .920 | .220 | .200 | .070 | .070 | .290 | 1.740 | .010 | .900 | 2066.00 |
| Phoenix | 05/03/93 | | 94.960 | 2.400 | .530 | .040 | .050 | .020 | .020 | .070 | 1.370 | .010 | .540 | 1022.00 |

24 rows selected.

Used Lube Oil Analyses
Example 8

| Decal Id | Date | Odometer | Component | - | Amount | Units | Method |
|---|---|---|---|---|---|---|---|
| LA008MT | 06/05/91 | 1947 | ACID_NO | | 3.40 | | ASTM-D974 |
| LA008MT | 06/05/91 | 1947 | API_GRAV | | 28.00 | | ASTM-D4052 |
| LA008MT | 06/05/91 | 1947 | Ag | < | .40 | PPM | ICP |
| LA008MT | 06/05/91 | 1947 | Al | | 20.00 | PPM | ICP |
| LA008MT | 06/05/91 | 1947 | B | < | 5.00 | PPM | ICP |
| LA008MT | 06/05/91 | 1947 | BASE_NO | | 2.40 | | ASTM-D664 |
| LA008MT | 06/05/91 | 1947 | Ba | | .60 | PPM | ICP |
| LA008MT | 06/05/91 | 1947 | Ca | | 154.00 | PPM | ICP |
| LA008MT | 06/05/91 | 1947 | Cd | | .90 | PPM | ICP |
| LA008MT | 06/05/91 | 1947 | Cr | | 2.40 | PPM | ICP |
| LA008MT | 06/05/91 | 1947 | Cu | | 30.00 | PPM | ICP |
| LA008MT | 06/05/91 | 1947 | FUEL_DIL | | 2.00 | WT% | GC |
| LA008MT | 06/05/91 | 1947 | Fe | | 117.00 | PPM | ICP |
| LA008MT | 06/05/91 | 1947 | Mg | | 1526.00 | PPM | ICP |
| LA008MT | 06/05/91 | 1947 | Mn | | 6.10 | PPM | ICP |
| LA008MT | 06/05/91 | 1947 | Mo | < | 2.00 | PPM | ICP |
| LA008MT | 06/05/91 | 1947 | NITRATION | | 12.00 | | |
| LA008MT | 06/05/91 | 1947 | Na | | 23.00 | PPM | ICP |
| LA008MT | 06/05/91 | 1947 | Ni | | 2.20 | PPM | ICP |
| LA008MT | 06/05/91 | 1947 | OXIDATION | | 9.00 | | |
| LA008MT | 06/05/91 | 1947 | P | | 957.00 | PPM | ICP |
| LA008MT | 06/05/91 | 1947 | Pb | | 18.00 | PPM | ICP |
| LA008MT | 06/05/91 | 1947 | SOOT | | .10 | | |
| LA008MT | 06/05/91 | 1947 | Si | | 30.00 | PPM | ICP |
| LA008MT | 06/05/91 | 1947 | Sn | < | 10.00 | PPM | ICP |
| LA008MT | 06/05/91 | 1947 | Ti | < | 1.00 | PPM | ICP |
| LA008MT | 06/05/91 | 1947 | V | | .10 | PPM | ICP |
| LA008MT | 06/05/91 | 1947 | VISC_100C | | 9.80 | CST | ASTM-D445 |
| LA008MT | 06/05/91 | 1947 | VISC_40C | | 63.70 | CST | ASTM-D445 |
| LA008MT | 06/05/91 | 1947 | VISC_INDX | | 137.00 | | ASTM-D2270 |
| LA008MT | 08/06/91 | 3391 | ACID_NO | | 3.00 | | ASTM-D974 |
| LA008MT | 08/06/91 | 3391 | API_GRAV | | 27.70 | | ASTM-D4052 |
| LA008MT | 08/06/91 | 3391 | Ag | < | .40 | PPM | ICP |
| LA008MT | 08/06/91 | 3391 | Al | | 16.00 | PPM | ICP |
| LA008MT | 08/06/91 | 3391 | B | < | 2.60 | PPM | ICP |
| LA008MT | 08/06/91 | 3391 | BASE_NO | | 4.80 | | ASTM-D664 |
| LA008MT | 08/06/91 | 3391 | Ba | < | .80 | PPM | ICP |
| LA008MT | 08/06/91 | 3391 | Ca | | 57.00 | PPM | ICP |
| LA008MT | 08/06/91 | 3391 | Cd | | 1.00 | PPM | ICP |
| LA008MT | 08/06/91 | 3391 | Cr | | 1.80 | PPM | ICP |
| LA008MT | 08/06/91 | 3391 | Cu | | 8.50 | PPM | ICP |
| LA008MT | 08/06/91 | 3391 | FUEL_DIL | | 3.00 | WT% | |
| LA008MT | 08/06/91 | 3391 | Fe | | 87.00 | PPM | ICP |
| LA008MT | 08/06/91 | 3391 | Mg | | 1744.00 | PPM | ICP |
| LA008MT | 08/06/91 | 3391 | Mn | | 2.90 | PPM | ICP |
| LA008MT | 08/06/91 | 3391 | NITRATION | | 7.00 | | |
| LA008MT | 08/06/91 | 3391 | Na | | 19.00 | PPM | ICP |
| LA008MT | 08/06/91 | 3391 | Ni | | 1.20 | PPM | ICP |
| LA008MT | 08/06/91 | 3391 | OXIDATION | | 12.00 | | |
| LA008MT | 08/06/91 | 3391 | P | | 1187.00 | PPM | ICP |
| LA008MT | 08/06/91 | 3391 | Pb | | 10.00 | PPM | ICP |
| LA008MT | 08/06/91 | 3391 | SOOT | | .10 | | |
| LA008MT | 08/06/91 | 3391 | Si | | 71.00 | PPM | ICP |

Used Lube Oil Analyses
Example 8

| Decal Id | Date | Odometer | Component | - | Amount | Units | Method |
|---|---|---|---|---|---|---|---|
| LA008MT | 08/06/91 | 3391 | Sn | | 6.40 | PPM | ICP |
| LA008MT | 08/06/91 | 3391 | Ti | < | .50 | PPM | ICP |
| LA008MT | 08/06/91 | 3391 | V | | .10 | PPM | ICP |
| LA008MT | 08/06/91 | 3391 | VISC_100C | | 11.10 | CST | ASTM-D445 |
| LA008MT | 08/06/91 | 3391 | VISC_40C | | 74.30 | CST | ASTM-D445 |
| LA008MT | 08/06/91 | 3391 | VISC_INDX | | 139.00 | CST | ASTM-D445 |
| LA008MT | 08/06/91 | 3391 | Zn | | 2284.00 | PPM | ICP |

60 rows selected.

```
REM  This query was created by Oracle Data Query
REM  Query id is 1827; query name EXAMPLE1


SET PAUSE OFF
SET VERIFY OFF
SET NEWPAGE 0
SET FEEDBACK 1
SET PAGESIZE 59
SET LINESIZE 500
SET ARRAYSIZE 50

TTITLE -
 CENTER 'Gallons of M85 Consumed in Detroit' -
 SKIP 1 CENTER 'Example 1' -
 SKIP 3

SET LINESIZE 34

COLUMN ODQ_DATE_VAR FORMAT A1 NEW_VALUE THE_DATE NOPRINT
COLUMN COL0 FORMAT A6 HEADING "Month"
COLUMN COL1 FORMAT 99999.9 HEADING "Fuel Consumed, gal"

SELECT TO_CHAR(LOG_DATE,'YY-MM') COL0,
       SUM(LDV_FUEL_ADD.AMOUNT_ADDED) COL1,
       TO_CHAR(SYSDATE, 'DD-MON-YYYY') ODQ_DATE_VAR
  FROM INTERIM.LDV_FUEL_ADD, INTERIM.LDV_VEH
 WHERE LDV_VEH.VIN = LDV_FUEL_ADD.VIN
   AND ( LDV_VEH.DECAL_ID LIKE 'DT%' AND LDV_FUEL_ADD.FUEL_TYPE_CODE = 'M' )
 GROUP BY TO_CHAR(LOG_DATE,'YY-MM')

/

EXIT
```

```
REM  This query was created by Oracle Data Query
REM  Query id is 1835; query name EXAMPLE3


SET PAUSE OFF
SET VERIFY OFF
SET NEWPAGE 0
SET FEEDBACK 1
SET PAGESIZE 59
SET LINESIZE 500
SET ARRAYSIZE 50

TTITLE -
 CENTER 'Summary Emissions' -
 SKIP 1 CENTER 'For Chevrolet Luminas' -
 SKIP 1 CENTER 'Regulated Gases' -
 SKIP 1 CENTER 'Example 3' -
 SKIP 3

SET LINESIZE 92

COLUMN ODQ_DATE_VAR FORMAT A1 NEW_VALUE THE_DATE NOPRINT
COLUMN COL0 FORMAT A12 HEADING "Vehicle Type"
COLUMN COL1 FORMAT 99 HEADING "Model Year"
COLUMN COL2 FORMAT 99999 HEADING "Aprox Odom"
COLUMN COL3 FORMAT A10 HEADING "Fuel"
COLUMN COL4 FORMAT A8 HEADING "Emission"
COLUMN COL5 FORMAT 999.9999 HEADING "Ave-StDev"
COLUMN COL6 FORMAT 999.9999 HEADING "Average"
COLUMN COL7 FORMAT 999.9999 HEADING "Ave+StDev"
COLUMN COL8 FORMAT A5 HEADING "Units"

SELECT EMIS_SUM.VEHICLE_TYPE COL0,
       EMIS_SUM.MODEL_YEAR COL1,
       EMIS_SUM.APROX_ODOM COL2,
       EMIS_SUM.FUEL_TYPE_CODE COL3,
       EMIS_SUM.MEASUREMENT COL4,
       EMIS_SUM.AVE_MINUS_STD COL5,
       EMIS_SUM.AVERAGE COL6,
       EMIS_SUM.AVE_PLUS_STD COL7,
       EMIS_SUM.MEAS_UNITS COL8,
       TO_CHAR(SYSDATE, 'DD-MON-YYYY') ODQ_DATE_VAR
  FROM INTERIM.EMIS_SUM
 WHERE EMIS_SUM.MODEL_CODE = 'L' AND EMIS_SUM.MEASUREMENT = 'CO'
OR EMIS_SUM.MEASUREMENT = 'NOx'
OR EMIS_SUM.MEASUREMENT = 'THC'
 ORDER BY  EMIS_SUM.MEASUREMENT ASC, EMIS_SUM.MODEL_YEAR ASC, EMIS_SUM.VEHICLE_TYPE ASC, EMIS_SUM.APROX_ODOM ASC, EMIS_SUM.FUEL_TYPE_CODE ASC

/

EXIT
```

```
REM  This query was created by Oracle Data Query
REM  Query id is 1828; query name EXAMPLE2


SET PAUSE OFF
SET VERIFY OFF
SET NEWPAGE 0
SET FEEDBACK 1
SET PAGESIZE 59
SET LINESIZE 500
SET ARRAYSIZE 50

TTITLE -
 CENTER 'Individual Refueling Occurences' -
 SKIP 1 CENTER 'Example 2' -
 SKIP 3

SET LINESIZE 54

COLUMN ODQ_DATE_VAR FORMAT A1 NEW_VALUE THE_DATE NOPRINT
COLUMN COL0 FORMAT A8 HEADING "Log Date"
COLUMN COL1 FORMAT 999999 HEADING "Odometer"
COLUMN COL2 FORMAT A10 HEADING "Fuel Type"
COLUMN COL3 FORMAT 99.9 HEADING "Amount Added"
COLUMN COL4 FORMAT A10 HEADING "Fuel Units"

SELECT TO_CHAR(LDV_FUEL_ADD.LOG_DATE,'DD-MM-YY') COL0,
       LDV_FUEL_ADD.CUR_ODOM COL1,
       LDV_FUEL_ADD.FUEL_TYPE_CODE COL2,
       LDV_FUEL_ADD.AMOUNT_ADDED COL3,
       LDV_FUEL_ADD.FUEL_UNITS_CODE COL4,
       TO_CHAR(SYSDATE, 'DD-MON-YYYY') ODQ_DATE_VAR
  FROM INTERIM.LDV_FUEL_ADD, INTERIM.LDV_VEH
 WHERE LDV_VEH.VIN = LDV_FUEL_ADD.VIN
   AND LDV_VEH.DECAL_ID = 'DC001ML'
 ORDER BY  LDV_FUEL_ADD.LOG_DATE ASC

/

EXIT
```

```
REM  This query was created by Oracle Data Query
REM  Query id is 1835; query name EXAMPLE3


SET PAUSE OFF
SET VERIFY OFF
SET NEWPAGE 0
SET FEEDBACK 1
SET PAGESIZE 59
SET LINESIZE 500
SET ARRAYSIZE 50

TTITLE -
 CENTER 'Summary Emissions' -
 SKIP 1 CENTER 'For Chevrolet Luminas' -
 SKIP 1 CENTER 'Regulated Gases' -
 SKIP 1 CENTER 'Example 3' -
 SKIP 3

SET LINESIZE 92

COLUMN ODQ_DATE_VAR FORMAT A1 NEW_VALUE THE_DATE NOPRINT
COLUMN COL0 FORMAT A12 HEADING "Vehicle Type"
COLUMN COL1 FORMAT 99 HEADING "Model Year"
COLUMN COL2 FORMAT 99999 HEADING "Aprox Odom"
COLUMN COL3 FORMAT A10 HEADING "Fuel"
COLUMN COL4 FORMAT A8 HEADING "Emission"
COLUMN COL5 FORMAT 999.9999 HEADING "Ave-StDev"
COLUMN COL6 FORMAT 999.9999 HEADING "Average"
COLUMN COL7 FORMAT 999.9999 HEADING "Ave+StDev"
COLUMN COL8 FORMAT A5 HEADING "Units"

SELECT EMIS_SUM.VEHICLE_TYPE COL0,
       EMIS_SUM.MODEL_YEAR COL1,
       EMIS_SUM.APROX_ODOM COL2,
       EMIS_SUM.FUEL_TYPE_CODE COL3,
       EMIS_SUM.MEASUREMENT COL4,
       EMIS_SUM.AVE_MINUS_STD COL5,
       EMIS_SUM.AVERAGE COL6,
       EMIS_SUM.AVE_PLUS_STD COL7,
       EMIS_SUM.MEAS_UNITS COL8,
       TO_CHAR(SYSDATE, 'DD-MON-YYYY') ODQ_DATE_VAR
  FROM INTERIM.EMIS_SUM
 WHERE EMIS_SUM.MODEL_YEAR = 93 AND EMIS_SUM.MEAS_UNITS = 'gm/mi'
AND EMIS_SUM.MODEL_CODE = 'L'
AND (EMIS_SUM.MEASUREMENT = 'NOx'
OR EMIS_SUM.MEASUREMENT = 'CO'
OR EMIS_SUM.MEASUREMENT = 'THC')
 ORDER BY  EMIS_SUM.MEASUREMENT ASC, EMIS_SUM.MODEL_YEAR ASC, EMIS_SUM.VEHICLE_TYPE ASC, EMIS_SUM.APROX_ODOM ASC, EMIS_SUM.FUEL_TYPE_CODE ASC

/

EXIT
```

```
REM  This query was created by Oracle Data Query
REM  Query id is 1833; query name EXAMPLE4


SET PAUSE OFF
SET VERIFY OFF
SET NEWPAGE 0
SET FEEDBACK 1
SET PAGESIZE 59
SET LINESIZE 500
SET ARRAYSIZE 50

TTITLE -
 CENTER 'Monthly Mileages for Luminas at Each Site' -
 SKIP 1 CENTER 'Example 4' -
 SKIP 3

SET LINESIZE 42

COLUMN ODQ_DATE_VAR FORMAT A1 NEW_VALUE THE_DATE NOPRINT
COLUMN COL0 FORMAT A16 HEADING "Vehicle Location"
COLUMN COL1 FORMAT A7 HEADING "Month"
COLUMN COL2 FORMAT 999999 HEADING "Monthly Mileage"

SELECT SUBSTR(DECAL_ID,1,2) COL0,
       TO_CHAR(LOG_DATE,'YY-MM') COL1,
       SUM(END_ODOM-BEGIN_ODOM) COL2,
       TO_CHAR(SYSDATE, 'DD-MON-YYYY') ODQ_DATE_VAR
  FROM INTERIM.LDV_MILEAGE, INTERIM.LDV_VEH
 WHERE LDV_MILEAGE.VIN = LDV_VEH.VIN
   AND ( SUBSTR(DECAL_ID,7,1) = 'L' AND SUBSTR(DECAL_ID,1,2) = 'AR' )
 GROUP BY SUBSTR(DECAL_ID,1,2), TO_CHAR(LOG_DATE,'YY-MM')
 ORDER BY  SUBSTR(DECAL_ID,1,2) ASC, TO_CHAR(LOG_DATE,'YY-MM') ASC

/

EXIT
```

```
REM  This query was created by Oracle Data Query
REM  Query id is 1834; query name EXAMPLE5


SET PAUSE OFF
SET VERIFY OFF
SET NEWPAGE 0
SET FEEDBACK 1
SET PAGESIZE 59
SET LINESIZE 500
SET ARRAYSIZE 50

TTITLE -
 CENTER 'Detailed Maintenance by Vehicle' -
 SKIP 1 CENTER 'Example 5' -
 SKIP 3

SET LINESIZE 145

COLUMN ODQ_DATE_VAR FORMAT A1 NEW_VALUE THE_DATE NOPRINT
COLUMN COL0 FORMAT A8 HEADING "Log Date"
COLUMN COL1 FORMAT 999999 HEADING "Odometer"
COLUMN COL2 FORMAT A30 HEADING "Repair Description"
COLUMN COL3 FORMAT 9999.99 HEADING "Labor Cost"
COLUMN COL4 FORMAT 9999.99 HEADING "Repair Labor Hours"
COLUMN COL5 FORMAT 9999.99 HEADING "Parts Cost"
COLUMN COL6 FORMAT 9999.99 HEADING "Other Cost"
COLUMN COL7 FORMAT A9 HEADING "Scheduled"
COLUMN COL8 FORMAT A12 HEADING "Service Code"
COLUMN COL9 FORMAT 9999.99 HEADING "Total Cost"
COLUMN COL10 FORMAT A8 HEADING "Warranty"

SELECT TO_CHAR(LDV_SHOP_MAINT.LOG_DATE,'dd-MM-YY') COL0,
       LDV_SHOP_MAINT.CUR_ODOM COL1,
       AFDC_CODES.CODE_DESCR COL2,
       LDV_SHOP_REPAIRS.LABOR_COST COL3,
       LDV_SHOP_REPAIRS.REPAIR_LABOR_HOURS COL4,
       LDV_SHOP_REPAIRS.PARTS_COST COL5,
       LDV_SHOP_REPAIRS.OTHER_COST COL6,
       LDV_SHOP_REPAIRS.SCHEDULED COL7,
       LDV_SHOP_REPAIRS.SERVICE_CODE COL8,
       LDV_SHOP_REPAIRS.TOTAL_COST COL9,
       LDV_SHOP_REPAIRS.WARRANTY COL10,
       TO_CHAR(SYSDATE, 'DD-MON-YYYY') ODQ_DATE_VAR
  FROM INTERIM.LDV_SHOP_MAINT, INTERIM.LDV_SHOP_REPAIRS,
       INTERIM.AFDC_CODES
 WHERE LDV_SHOP_MAINT.MAINT_NUM = LDV_SHOP_REPAIRS.MAINT_NUM
   AND LDV_SHOP_REPAIRS.CPSC_REPAIR_CODE = AFDC_CODES.CODE_VAL
   AND ( LDV_SHOP_MAINT.DECAL_ID = 'DC001ML' AND AFDC_CODES.CODE_TYPE = 'CPSC_REPAIR_CODE' )
 ORDER BY  LDV_SHOP_MAINT.LOG_DATE ASC

/

EXIT
```

```
REM  This query was created by Oracle Data Query
REM  Query id is 1836; query name EXAMPLE6


SET PAUSE OFF
SET VERIFY OFF
SET NEWPAGE 0
SET FEEDBACK 1
SET PAGESIZE 59
SET LINESIZE 500
SET ARRAYSIZE 50

TTITLE -
 CENTER 'Detailed Weighted FTP Emissions' -
 SKIP 1 CENTER 'for a Specific Vehicle' -
 SKIP 1 CENTER 'DT004ML' -
 SKIP 1 CENTER 'Example 6' -
 SKIP 3

SET LINESIZE 94

COLUMN ODQ_DATE_VAR FORMAT A1 NEW_VALUE THE_DATE NOPRINT
COLUMN COL0 FORMAT A8 HEADING "Emis Lab"
COLUMN COL1 FORMAT A10 HEADING "Test Fuel"
COLUMN COL2 FORMAT 99999 HEADING "Odometer"
COLUMN COL3 FORMAT A9 HEADING "Date"
COLUMN COL4 FORMAT 99.9999 HEADING "CO"
COLUMN COL5 FORMAT 99.9999 HEADING "NOx"
COLUMN COL6 FORMAT 99.9999 HEADING "THC"
COLUMN COL7 FORMAT 99.9999 HEADING "OMHCE"
COLUMN COL8 FORMAT 99.9999 HEADING "NMHC"
COLUMN COL9 FORMAT 99.9999 HEADING "HCHO"

SELECT LDV_EMISSIONS.LAB_ID_CODE COL0,
       LDV_EMISSIONS.EMIS_FUEL_CODE COL1,
       LDV_EMISSIONS.CUR_ODOM COL2,
       TO_CHAR(LDV_EMISSIONS.TEST_DATE,'DD-MON-YY') COL3,
       LDV_EMISSIONS.CO COL4,
       LDV_EMISSIONS.NOX COL5,
       LDV_EMISSIONS.THC COL6,
       LDV_EMISSIONS.OMHCE COL7,
       LDV_EMISSIONS.NMHC COL8,
       LDV_EMISSIONS.HCHO COL9,
       TO_CHAR(SYSDATE, 'DD-MON-YYYY') ODQ_DATE_VAR
  FROM INTERIM.LDV_EMISSIONS
 WHERE LDV_EMISSIONS.DECAL_ID = 'DT004ML' AND LDV_EMISSIONS.TEST_TYPE_CODE = 'FTP'
AND LDV_EMISSIONS.BAG_ID = 'WT'
 ORDER BY  LDV_EMISSIONS.EMIS_FUEL_CODE ASC, LDV_EMISSIONS.CUR_ODOM ASC

/

EXIT
```

```
REM  This query was created by Oracle Data Query
REM  Query id is 1840; query name EXAMPLE7


SET PAUSE OFF
SET VERIFY OFF
SET NEWPAGE 0
SET FEEDBACK 1
SET PAGESIZE 59
SET LINESIZE 500
SET ARRAYSIZE 45

TTITLE -
 CENTER 'CNG Fuel Analysis' -
 SKIP 1 CENTER 'Example 7' -
 SKIP 3

SET LINESIZE 176

COLUMN ODQ_DATE_VAR FORMAT A1 NEW_VALUE THE_DATE NOPRINT
COLUMN COL0 FORMAT A12 HEADING "Site Name"
COLUMN COL1 FORMAT A9 HEADING "Samp Date"
COLUMN COL2 FORMAT A9 HEADING "Anal Date"
COLUMN COL3 FORMAT 999.999 HEADING "CH4, mole%"
COLUMN COL4 FORMAT 999.999 HEADING "C2H6, mole%"
COLUMN COL5 FORMAT 999.999 HEADING "C3H8, mole%"
COLUMN COL6 FORMAT 999.999 HEADING "I-C4, mole%"
COLUMN COL7 FORMAT 999.999 HEADING "N-C4, mole%"
COLUMN COL8 FORMAT 999.999 HEADING "I-C5, mole%"
COLUMN COL9 FORMAT 999.999 HEADING "N-C5, mole%"
COLUMN COL10 FORMAT 999.999 HEADING "C6, mole%"
COLUMN COL11 FORMAT 999.999 HEADING "CO2, mole%"
COLUMN COL12 FORMAT 999.999 HEADING "O2, mole%"
COLUMN COL13 FORMAT 999.999 HEADING "N2, mole%"
COLUMN COL14 FORMAT 9999.99 HEADING "Heat Val, BTU/SCF"

SELECT FLUID_SAMPLES.SAMPLE_SITE_NAME COL0,
       TO_CHAR(FLUID_SAMPLES.SAMPLE_DATE,'MM/DD/YY') COL1,
       TO_CHAR(FLUID_SAMPLES.ANALYSIS_DATE,'MM/DD/YY') COL2,
       SUM(DECODE(COMPONENT_TYPE_CODE,'CH4%',COMPONENT_AMT,0)) COL3,
       SUM(DECODE(COMPONENT_TYPE_CODE,'C2H6%',COMPONENT_AMT,0)) COL4,
       SUM(DECODE(COMPONENT_TYPE_CODE,'C3H8%',COMPONENT_AMT,0)) COL5,
       SUM(DECODE(COMPONENT_TYPE_CODE,'I-C4%',COMPONENT_AMT,0)) COL6,
       SUM(DECODE(COMPONENT_TYPE_CODE,'N-C4%',COMPONENT_AMT,0)) COL7,
       SUM(DECODE(COMPONENT_TYPE_CODE,'I-C5%',COMPONENT_AMT,0)) COL8,
       SUM(DECODE(COMPONENT_TYPE_CODE,'I-C5%',COMPONENT_AMT,0)) COL9,
       SUM(DECODE(COMPONENT_TYPE_CODE,'C6%',COMPONENT_AMT,0)) COL10,
       SUM(DECODE(COMPONENT_TYPE_CODE,'CO2%',COMPONENT_AMT,0)) COL11,
       SUM(DECODE(COMPONENT_TYPE_CODE,'O2%',COMPONENT_AMT,0)) COL12,
       SUM(DECODE(COMPONENT_TYPE_CODE,'N2%',COMPONENT_AMT,0)) COL13,
       SUM(DECODE(COMPONENT_TYPE_CODE,'HEAT_VAL',COMPONENT_AMT,0)) COL14,
       TO_CHAR(SYSDATE, 'DD-MON-YYYY') ODQ_DATE_VAR
  FROM INTERIM.FLUID_SAMPLES, INTERIM.FLUID_ANALYSIS_DATA
 WHERE FLUID_ANALYSIS_DATA.SAMPLE_ID = FLUID_SAMPLES.SAMPLE_ID
   AND FLUID_SAMPLES.FLUID_TYPE_CODE = 'CNG'
 GROUP BY FLUID_SAMPLES.SAMPLE_SITE_NAME,
 TO_CHAR(FLUID_SAMPLES.SAMPLE_DATE,'MM/DD/YY'),
 TO_CHAR(FLUID_SAMPLES.ANALYSIS_DATE,'MM/DD/YY'),
TO_CHAR(FLUID_SAMPLES.SAMPLE_DATE, 'YYMMDD')
```

```
 ORDER BY  FLUID_SAMPLES.SAMPLE_SITE_NAME ASC, TO_CHAR(FLUID_SAMPLES.SAMPLE_DATE, 'YYMMDD') ASC

/

EXIT
```

```
REM  This query was created by Oracle Data Query
REM  Query id is 1842; query name EXAMPLE8


SET PAUSE OFF
SET VERIFY OFF
SET NEWPAGE 0
SET FEEDBACK 1
SET PAGESIZE 59
SET LINESIZE 500
SET ARRAYSIZE 50

TTITLE -
 CENTER 'Used Lube Oil Analyses' -
 SKIP 1 CENTER 'Example 8' -
 SKIP 3

SET LINESIZE 68

COLUMN ODQ_DATE_VAR FORMAT A1 NEW_VALUE THE_DATE NOPRINT
COLUMN COL0 FORMAT A8 HEADING "Decal Id"
COLUMN COL1 FORMAT A8 HEADING "Date"
COLUMN COL2 FORMAT 99999 HEADING "Odometer"
COLUMN COL3 FORMAT A10 HEADING "Component"
COLUMN COL4 FORMAT A1 HEADING "-"
COLUMN COL5 FORMAT 9999.99 HEADING "Amount"
COLUMN COL6 FORMAT A5 HEADING "Units"
COLUMN COL7 FORMAT A11 HEADING "Method"

SELECT LDV_VEH.DECAL_ID COL0,
       TO_CHAR(FLUID_SAMPLES.SAMPLE_DATE,'MM/DD/YY') COL1,
       FLUID_SAMPLES.CUR_ODOM COL2,
       FLUID_ANALYSIS_DATA.COMPONENT_TYPE_CODE COL3,
       FLUID_ANALYSIS_DATA.UND_DETECT_LMT_IND COL4,
       FLUID_ANALYSIS_DATA.COMPONENT_AMT COL5,
       FLUID_ANALYSIS_DATA.UNITS_CODE COL6,
       FLUID_ANALYSIS_DATA.TEST_METHODS_CODE COL7,
       TO_CHAR(SYSDATE, 'DD-MON-YYYY') ODQ_DATE_VAR
  FROM INTERIM.LDV_VEH, INTERIM.FLUID_SAMPLES,
       INTERIM.FLUID_ANALYSIS_DATA
 WHERE FLUID_SAMPLES.SAMPLE_ID = FLUID_ANALYSIS_DATA.SAMPLE_ID
   AND LDV_VEH.VIN = FLUID_SAMPLES.VIN
   AND DECAL_ID = 'LA008MT'
 ORDER BY  FLUID_SAMPLES.CUR_ODOM ASC, FLUID_ANALYSIS_DATA.COMPONENT_TYPE_CODE ASC

/

EXIT
```

# APPENDIX 4

## Maintenance Repair Codes
## and
## Fuel Analysis Codes Currently in Use

| Codes used for Fluid Analysis | | | | | |
|---|---|---|---|---|---|
| Fluid Analysis Data | | Type of Fluid Analysis Using Each Analysis | | | |
| COMPONENT_TYPE_CODE | Code Description | Lube Oil | Diesel | CNG | Alcohol |
| Ag | Silver | X | | | |
| Al | Aluminum | X | | | X |
| B | Boron | X | | | |
| Ba | Barium | X | | | |
| Ca | Calcium | X | | | X |
| Cd | Cadmium | X | | | |
| Cl | Chlorine | | | | X |
| Cr | Chromium | X | | | |
| Cu | Copper | X | | | X |
| Fe | Iron | X | | | X |
| K | Potasium | X | | | |
| Mg | Magnesium | X | | | |
| Mn | Manganese | X | | | X |
| Mo | Molybdenum | X | | | |
| Na | Sodium | X | | | X |
| Ni | Nickel | X | | | |
| P | Phorphorus | X | | | X |
| Pb | Lead | X | | | X |
| S | Sulfur | | X | | |
| Si | Silicon | X | | | |
| Sn | Tin | X | | | |
| Ti | Titanium | X | | | |
| V | Vanadium | X | | | |
| Zn | Zinc | X | | | |
| C2H6% | Ethane | | | X | |
| C3H8% | Propane | | | X | |
| C6% | Hexane | | | X | |
| CH4% | Methane | | | X | |
| CO2% | Carbon Dioxide | | | X | |
| I-C4% | i-Butane | | | X | |
| I-C5% | i-Pentane | | | X | |
| N-C4% | n-Butane | | | X | |
| N-C5% | n-Pentane | | | X | |
| N2% | Nitrogen | | | X | |
| O2% | Oxygen | | | X | |
| WAT_DILUT | Water Dillution | X | | | |
| WATER% | Percent Water | | | | X |
| AROMATICS | Aromatics | | X | | |
| ALC% | Percent Alcohol | | | | X |
| OXIDATION | Oxidation | X | | | |
| NITRATION | Nitration | X | | | |
| ACID_NO | Total Acid Number | X | | | X |
| BASE_NO | Total Base Number | X | | | |
| ALC_DILUT | Fuel Dilution (Alcohol distillation) | X | | | |
| API_GRAV | API Gravity | X | X | | X |
| APPEARANCE | Appearance | X | | | |
| CARB_RES | Carbon Residue (Pentane Insolubles) | X | | | |
| CETANE_NDX | Cetane Index | | X | | |
| DENSITY | Density | X | | | X |
| FLSH_PNT | Flash Point | X | | | |
| GLYCOL | Glycol | X | | | |
| GSLN_DILUT | Fuel Dilution (gasoline distillation) | X | | | |
| GUM_FLTR? | Gum sample filtered? | | | | X |
| GUM_UNWSH | Gum, unwashed | | | | X |

| Codes used for Fluid Analysis | | | | | |
|---|---|---|---|---|---|
| Fluid Analysis Data | | Type of Fluid Analysis Using Each Analysis | | | |
| COMPONENT_TYPE_CODE | Code Description | Lube Oil | Diesel | CNG | Alcohol |
| GUM_WSH | Gum, existant (washed) | | | | X |
| HEAT_VAL | Gross Heating Value | | X | X | X |
| ODOR | Odor Comments | X | | | |
| PARTICLES | Particulates | | | | X |
| VOL_PARTC | Volume used in particulates test | | | | X |
| POUR_PT | Pour Point | X | X | | |
| RON | Research Octane No. | | | | X |
| MON | Motor Octane No. | | | | X |
| RVP | Reid Vapor Pressure | | | | X |
| SULF_ASH | Sulfated Ash | X | | | |
| VICS_80C | Viscosity, 80 C | | X | | |
| VISC_100C | Viscosity, 100 C | X | | | |
| VISC_40C | Viscosity, 40 C | X | X | | |
| VISC_INDX | Viscosity Index | X | | | |
| VL_RAT105 | Vapor/Liquid Ratio @ 105 F | | | | X |
| VL_RAT124 | Vapor/Liquid Ratio @ 124 F | | | | X |
| VL_RAT140 | Vapor/Liquid Ratio @ 140 F | | | | X |
| DIST_%DST | Distillation Curve, % distilled | | X | | |
| DIST_%LOS | Distillation Curve, % loss | | X | | |
| DIST_%RES | Distillation Curve, % residue | | X | | |
| DIST_IBP | Distillation Curve, Initial Boiling Point | | X | | |
| DIST_5% | Distillation Curve, Temperature when 5% distilled | | X | | |
| DIST_10% | Distillation Curve, Temperature when 10% distilled | | X | | |
| DIST_20% | Distillation Curve, Temperature when 20% distilled | | X | | |
| DIST_30% | Distillation Curve, Temperature when 30% distilled | | X | | |
| DIST_40% | Distillation Curve, Temperature when 40% distilled | | X | | |
| DIST_50% | Distillation Curve, Temperature when 50% distilled | | X | | |
| DIST_60% | Distillation Curve, Temperature when 60% distilled | | X | | |
| DIST_70% | Distillation Curve, Temperature when 70% distilled | | X | | |
| DIST_80% | Distillation Curve, Temperature when 80% distilled | | X | | |
| DIST_90% | Distillation Curve, Temperature when 90% distilled | | X | | |
| DIST_95% | Distillation Curve, Temperature when 95% distilled | | X | | |
| DIST_FBP% | Distillation Curve, Final Boiling Point | | X | | |
| SOOT | | X | | | |

| Appendix 4 - Maintenance Repair Codes Currently in Use | |
|---|---|
| Repair Code Field:<br>CPSC_REPAIR_CODE<br>In Table:<br>LDV_SHOP_REPAIRS | Code Description Field:<br>CODE_DESCR<br>In Table:<br>AFDC_CODES |
| 00.00.51 | Noise - Exterior |
| 00.00.79 | In-Service Inspection/Roadworthiness |
| 01.01.02 | Body Dash and Cowl |
| 01.03.00 | Body Closure Subsystem |
| 01.03.01 | Front Side Doors |
| 01.04.03 | Special Truck Body |
| 01.07.00 | Sealing Subsystem |
| 01.09.01 | Inside Mirrors |
| 01.14.00 | Handles, Locks, Latches, and Mechanisms Subsystem |
| 01.14.01 | Lock Set and Keys |
| 01.16.00 | Wipers and Washers Subsystem |
| 01.16.01 | Windshield/Backlite Wipers |
| 01.18.01 | Body Paint |
| 01.20.01 | Seat Belts/Shoulder Harness |
| 01.20.02 | Seat Belt/Shoulder Harness Switches |
| 01.20.03 | Passenger Restraint Bags |
| 02.03.01 | Engine Mounts |
| 03.01.02 | Cylinder Heads |
| 03.01.03 | Intake Manifold |
| 3.01.04 | Exhaust Manifold |
| 03.02.00 | Engine Lubrication Subsystem |
| 03.02.06 | Engine Lubricant |
| 03.03.00 | Engine Cooling Subsystem |
| 03.03.05 | Coolant Pump and Flow Control |
| 03.03.07 | Engine Coolant |
| 03.03.11 | Engine Coolant Heating Element |
| 03.04.00 | Fuel Charging and Controls Subsystem |
| 03.04.02 | Fuel Injection - Mechanical Components |
| 03.04.03 | Fuel Injection - Electrical Components |
| 03.05.07 | Drive Belts |
| 03.05.09 | Other Accessory Drive Pulleys |
| 03.06.03 | Starter and Integral Solenoid |
| 03.07.00 | Engine Ignition Subsystem |
| 03.07.02 | Ignition Coil |
| 03.07.04 | Spark/Glow Plugs |
| 03.07.05 | Electronic Ignition/Glow Plug Modules |
| 03.08.01 | Engine Ventilation |
| 03.08.04 | Exhaust Gas Recirculation |
| 03.08.06 | Catalytic Converter - Internal Components |
| 03.08.52 | Engine Emission Control - Alternative Fuels |
| 03.09.01 | Camshaft and Drive |
| 03.12.01 | Air Cleaner and Associated Components |
| .13.03 | Control Modules and Solenoids |

| Appendix 4 (Continued) - Maintenance Repair Codes Currently in Use | |
|---|---|
| Repair Code Field:<br>CPSC_REPAIR_CODE<br>In Table:<br>LDV_SHOP_REPAIRS | Code Description Field:<br>CODE_DESCR<br>In Table:<br>AFDC_CODES |
| 03.14.00 | Electronic Engine Control Subsystem |
| 03.14.01 | Computer Assembly |
| 03.14.03 | Sensors/Signal Conditioning Devices |
| 03.14.04 | Electronic Actuator Devices |
| 04.01.00 | Front Suspension Subsystem |
| 04.02.05 | Rear Stabilizer Bar |
| 04.04.02 | Tires |
| 04.04.03 | Wheel Ornamentation |
| 05.02.08 | Lubricants |
| 06.00.00 | BRAKE SYSTEM |
| 06.01.00 | Front Drum Brake Subsystem |
| 06.01.01 | Front Drum |
| 06.01.02 | Front Drum Brake Assembly and Attaching Parts |
| 06.02.00 | Rear Drum Brake Subsystem |
| 06.02.02 | Rear Drum Brake Assembly and Attaching Parts |
| 06.03.00 | Front Disc Brake Subsystem |
| 06.03.02 | Front Caliper and Attaching Parts |
| 07.00.00 | TRANSMISSION SYSTEM |
| 07.01.00 | Automatic Transmission/Transaxle Subsystem |
| 07.01.01 | Housing and Seals |
| 07.01.02 | Internal Hydraulic or Mechanical Controls and Pumps |
| 09.03.01 | Exhaust Pipes |
| 09.03.02 | Exhaust System Seals |
| 10.01.00 | Fuel Tank and Lines Subsystem |
| 10.01.01 | Fuel Tanks and Reservoirs |
| 10.01.03 | Fuel Lines and Filters (Chassis) |
| 10.01.04 | Filler Cap and Pipe |
| 10.01.06 | Electric Fuel Pumps |
| 10.01.07 | Fuel |
| 11.01.01 | Manual Steering Gear |
| 11.02.04 | Power Steering Pump |
| 11.04.00 | Steering Column Subsystem |
| 11.04.01 | Steering Column and Shaft |
| 11.04.02 | Transmission Shift Mechanism |
| 12.02.00 | Heating/Defrosting Subsystem |
| 12.03.00 | Air Conditioning Subsystem |
| 12.03.01 | Compressor |
| 12.03.05 | Air Conditioning Lines and Fittings |
| 13.01.01 | Instrument Cluster/Console Modules |
| 13.03.01 | Fuel Senders and Gauges |
| 13.03.02 | Low Fuel Warning Devices |
| 13.06.00 | Horn Subsystem |
| 13.09.01 | Gauges/Warning Lights |
| [illegible].01.01 | Battery |

| Appendix 4 (Continued) - Maintenance Repair Codes Currently in Use | |
|---|---|
| Repair Code Field:<br>CPSC_REPAIR_CODE<br>In Table:<br>LDV_SHOP_REPAIRS | Code Description Field:<br>CODE_DESCR<br>In Table:<br>AFDC_CODES |
| 14.01.02 | Battery Hold-Down and Supports |
| 14.02.01 | Generator/Alternator |
| 16.00.00 | VACUUM DISTRIBUTION SYSTEM |
| 16.03.01 | Transmission Vacuum Components |
| 16.04.00 | Vacuum Generator Subsystem |
| 17.00.00 | LIGHTING SYSTEM |
| 17.01.01 | Headlamps (High and Low Beam) and Headlamp Adjusting Components |
| 17.01.03 | Position and Parking Lamps (Unique Components Only) |
| 17.02.01 | Engine Compartment Lighting |
| 17.02.02 | Courtesy Lighting/Identification |
| 17.03.01 | Rear Stop/Taillamps |
| 17.05.01 | Headlamp Switches |
| 18.00.00 | ELECTRICAL DISTRIBUTION AND ELECTRONIC CONTROL SYSTEM |
| 18.01.00 | Electrical Wiring and Circuit Protection Subsystem |
| 18.01.01 | Front End and Engine Compartment Wiring |
| 18.01.02 | Instrument Panel and Cowl Wiring |
| 18.01.07 | Wiring, Connector, Terminal, Socket, Relay, and Module Fasteners |
| 18.02.01 | Turn Signal Flashers |
| 18.05.01 | Multiple Function Electronic Modules |