

# Nissan Data Scan User Manual



<http://www.nissandatascan.com>  
Rev. 1 2008

A note to our customers:

This software is provided to assist the enthusiast in performing tuning and data collection on the user's car for the purpose of maintenance and performance improvement. We at blaZt strongly suggest you read this manual and understand the contents before using it to tune your vehicle. We make no warranty implied or otherwise regarding the use of this software or any hardware supplied by blaZt.

This manual developed for blaZt by KK Engineering.  
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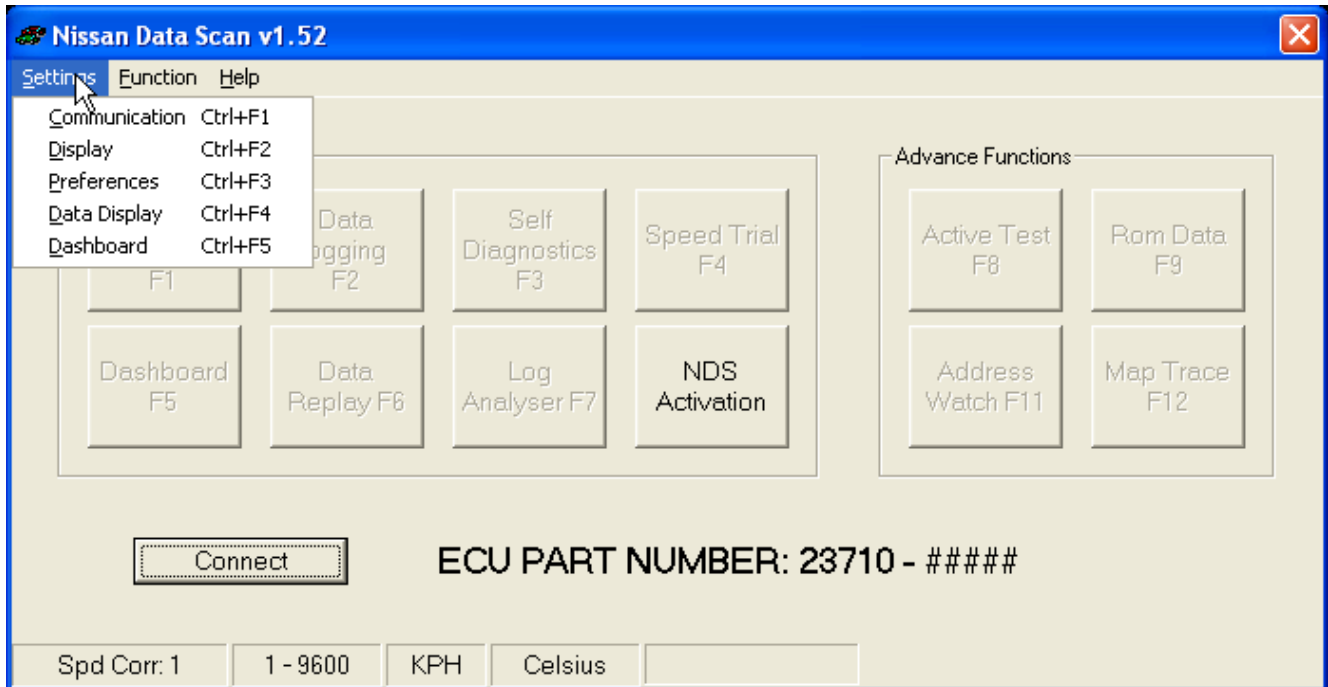
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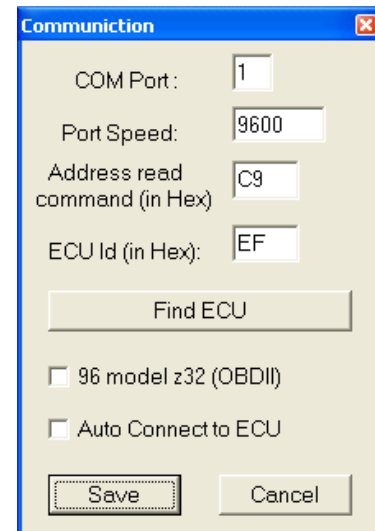
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## The Main Screen Menus



The settings menu is accessed via the pull down menu on the main screen. This menu provides access to the general program settings.

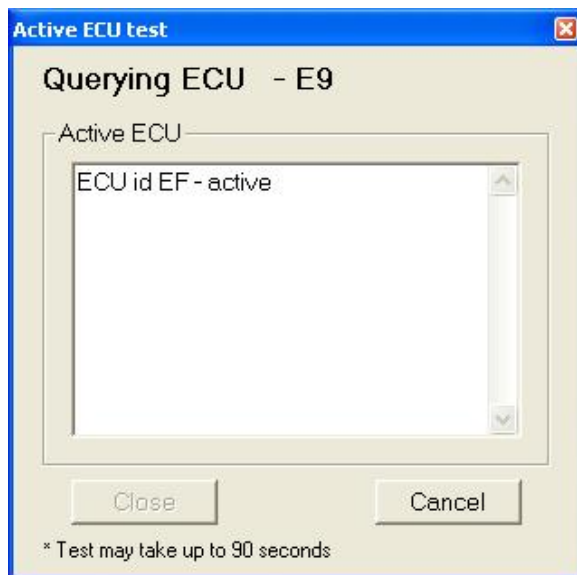


**Communication-** The Communication screen configures parameters required for NDS to access your ECU.

- A. The port setting defaults will work for most users. Select a different COM port number if the port your cable is connected to is not COM 1.
- B. **Address read command** - specifies the command to be used for reading ECU memory data. Some ECUs with daughter boards use command other than the default.
- C. **ECU Id** - specifies target ECU. Engine ECU Id varies between regions and models. This is usually set to EF

## Communication- Cont'd.

D. **Find ECU** -This button tests for active ECU IDs.

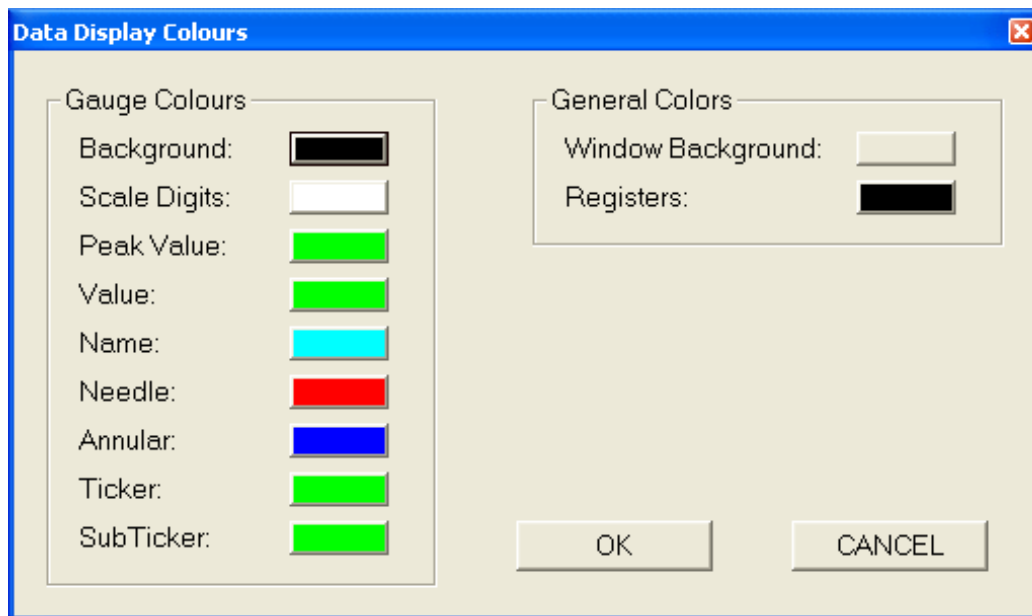


### NOTE:

ECUs other than engine ECU may respond to the query during the Active ECU test. Identified IDs can then be tested for compatibility by entering the ID in the ECU Id setting on Communication window and running a test connection. NDS only supports engine ECUs.

E. **96 model z32** - Check the box if your car is a 1996 model year 300ZX. This setting allows for communication with 96 model 300zx OBDII complaint cars via the Consult I port. You may also have to check this box if your ECU is later than 1996 in some other models.

F. **Auto Connect to ECU** - This checkbox should be selected if you want NDS to connect automatically to your ECU each time the program starts.



**Display** – The display settings panel provides selections to customize the gauge display screen and the general program colors. The settings are save automatically when “OK” is selected.

**Preferences**

Tyre Size Speed Correction

OEM size: W 205 H 55 D 16

Current size: W 205 H 55 D 16

Speed Unit: KPH

Temperature Unit: Celsius

Save Cancel

**Preferences – Tyre Size Speed Correction** - Use the selections on the preferences menu to set the tire size information. Setting the correct values enables NDS to provide accurate reports of time/distance when using the *Speed Trial* feature. For example: When aftermarket wheels are used on the car, the corrected value will be displayed in Data Display window. It does NOT effect vehicle speedometer reading.

**Speed Unit and Temperature Unit** – Use the pull down menus to select Imperial or Metric units.

**Data Display Settings**

Gauge 1: RPM

Gauge 2: Speed

Gauge 3: Water Temperature

Gauge 4: Battery Voltage

Gauge 5: Ignition Timing

Gauge 6: Injector Time

Gauge 7: Duty Cycle (require RPM & Inj)

Gauge 8: Air Fuel Base

Gauge 9: Throttle Position Sensor

Gauge 10: Air Flow

Gauge 11: O2 Sensor

Gauge 12: AAC Valve

Registers

☒ Register 13 ☒ Register 1E ☒ Register 1F ☒ Register 21

Test for live registers Save Cancel

\* Test may take up to 30 seconds

**Data Display Settings** – When the *Data Display* Basic Function is active, the computer screen becomes a full screen gauge panel. *The Data Display Settings* panel allows the user to determine what each of the 12 gauges will display. Note that all 12 gauges must have a selection. Also note that not all listed gauges are supported for all ECU / vehicle types. Selecting a gauge that is not supported, such as EGT when no EGT is fitted, will cause an error and all gauges will display 0. (Multiple gauges may monitor the same parameter.)

The following is a list of possible gauge selections:

**RPM** – Engine speed in revs per minute.

**Air Flow** - Voltage from the MAF (left side if two sensors are configured).

**Air Flow Right Hand** - Voltage from the right side MAF when dual sensors are configured.

**Water Temperature** - Coolant temp in °C or ° F.

**O2 Sensor** - Percentage of full scale of the oxygen sensor (left side if two sensors are configured as in the case of dual exhaust systems). Oscillates between 10 and 90 when the engine is in closed loop mode. This is normal and desirable for fuel economy. ECU will switch to open mode while accelerating hard. This is a narrow band sensor and should never be used for tuning.

**O2 Sensor Right Hand** - Percentage of full scale of the right side oxygen sensor when dual sensors are configured.

**Speed** – Vehicle speed in KPH or MPH.

**Battery Voltage** - Battery charge level in volts.

**Throttle Position Sensor** - Voltage signal from the throttle sensor.

**Fuel Temperature sensor** – Fuel temp in °C or ° F as measured at the fuel injection rail.

**Intake Air Temperature** – Temperature of the incoming air.

**Exhaust Gas Temperature** – Temperature of the exhaust gases vehicle must be fitted with EGT probe. ( Currently only ??? EGT Sensors are supported.)

**Injector Time** – Pulse width of injectors. (left side if engine is a V6 or V8 and configured to control the banks individually).

**Injector Time Right Hand** – Pulse width of right bank injectors if engine is a V6 or V8 and configured to control the banks individually.

**Ignition Timing** – Spark timing in degrees.

**AAC Valve** – Percentage of the Auxiliary Air Control Valve opening (idle speed control)

**Air Fuel Base** - Percentage of a fuel map setting currently used to run engine in closed loop. Also referred to as Short Term Fuel Trim. (left side if engine is a V6 or V8).

**Air Fuel Base Right Hand** - Percentage of a fuel map setting currently used to run engine in closed loop. Also referred to as Short Term Fuel Trim. Right hand bank on V6 or V8 Engines.

**Air Fuel Base Self Learn** - A/F Base value learned by the ECU, also called Long Term Fuel Trim or Self Learn. (Left hand side of V6 or V8 Engines.)

**Air Fuel Base Self Learn Right Hand** - A/F Base value learned by the ECU, also called Long Term Fuel Trim or Self Learn. (Right hand side of V6 or V8 Engines.)

**Duty Cycle** – Duty cycle of fuel injectors as a percentage of total available cycle time. (left bank if engine is a V6 or V8 and configured to control the banks individually). RPM and Injector Time must also be selected. Duty Cycle is calculated from Injector time. Injector opening time is calculated by the ECU based on an engine load. It's not a measured value and it might not be achievable given the RPM. Due to this, it's not uncommon to see Duty Cycle above 100%.

## Gauge Selections - Cont'd

**Duty Cycle Right Hand**– Duty cycle of right bank fuel injectors as a percentage of total available cycle time when engine is a V6 or V8 and configured to control the banks individually). RPM and Injector Time Right Hand must also be selected.

**O2 Sensor B1** - Percentage of full scale of the oxygen sensor on OBDII compliant cars located after the catalytic converter. (left side if two sensors are configured as in the case of dual exhaust systems).

**O2 Sensor B2** - Percentage of full scale of the right side oxygen sensor on OBDII compliant cars, located after the catalytic converter when dual sensors are configured as in the case of dual exhaust systems.

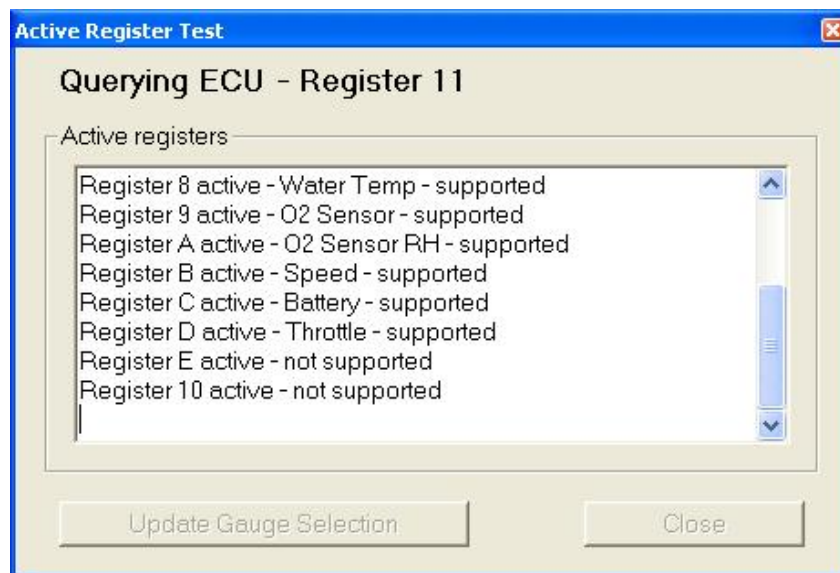
**Registers** – There are four register check boxes at the bottom of the screen, which can be used to enable monitoring of registers 13, 1E, 1F, 21.

Register 13 – Closed TPS Switch, Air Conditioning Switch, Power Steering, Start Signal, Neutral

Register 1E – Air Conditioning Relay, Fuel Pump, VCT, Thermo Fan

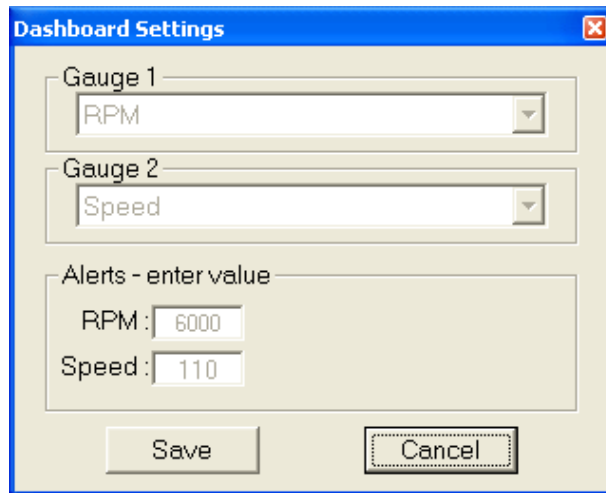
Register 1F – Waste Gate Solenoid, EGR Solenoid

Register 21 – Air/Fuel Ratio



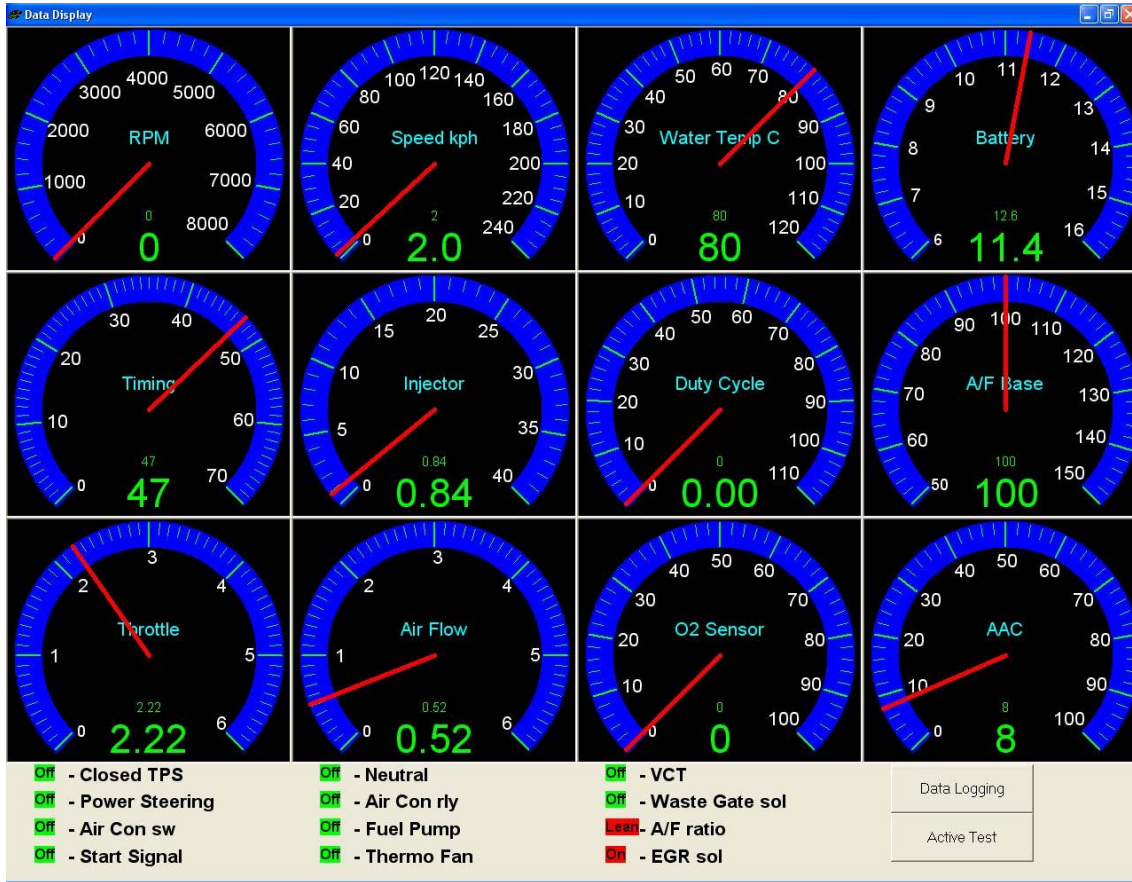
**Test for live registers** – This button queries the ECU for active registers. When the query is complete, select Update Gauge Selection to populate the gauge drop down lists with only those gauge choices supported by the ECU.



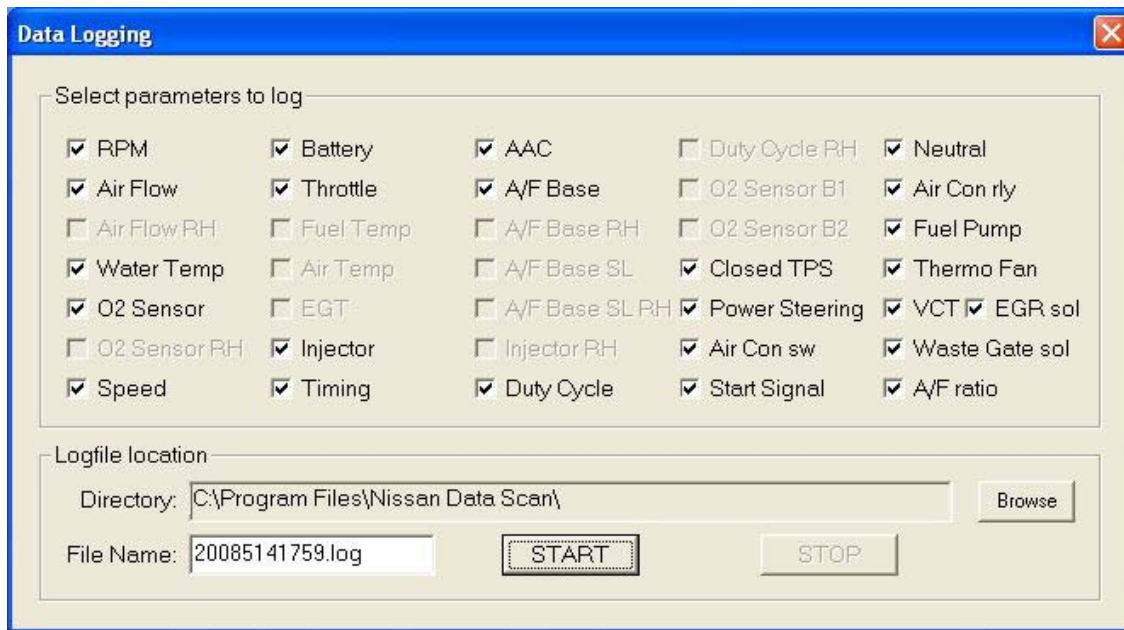


**Dashboard Settings** – Select the two gauges to use when using the ***Dashboard*** function described on page 12. This feature is targeted at car PC users but is also a good way for a tuner to monitor 2 important readings without the clutter of the main Data Display. Use the ***Alerts*** options to set limit points for warnings when set limits are reached. Setting the limits to unachievable values will effectively disable the alerts.

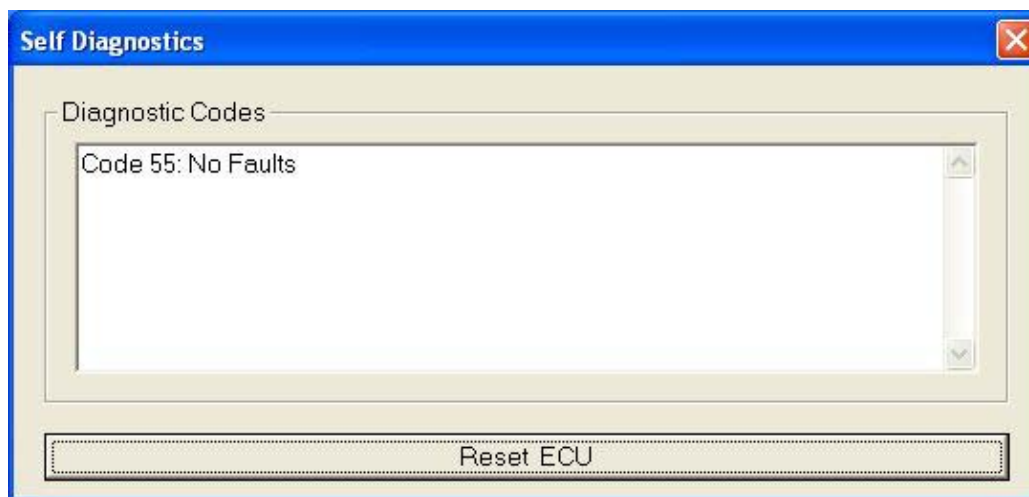
**Program Functions** – The main program functions are accessible in three ways. They can be selected from the pull down menu at the top of the Main Screen, by clicking on the large Main Screen buttons or by pressing the corresponding Function Key on the keyboard. The functions are divided into 2 groups. Basic Functions that are useful for general monitoring of vehicle parameters and Advanced Functions for use in testing and tuning.



**Data Display** – After configuring the *Data Display* options in the *Settings Menu*, selecting the *Data Display Function* will bring up a display of all the gauges that were assigned a function. These gauges display actual data as provided to the ECU in real time.



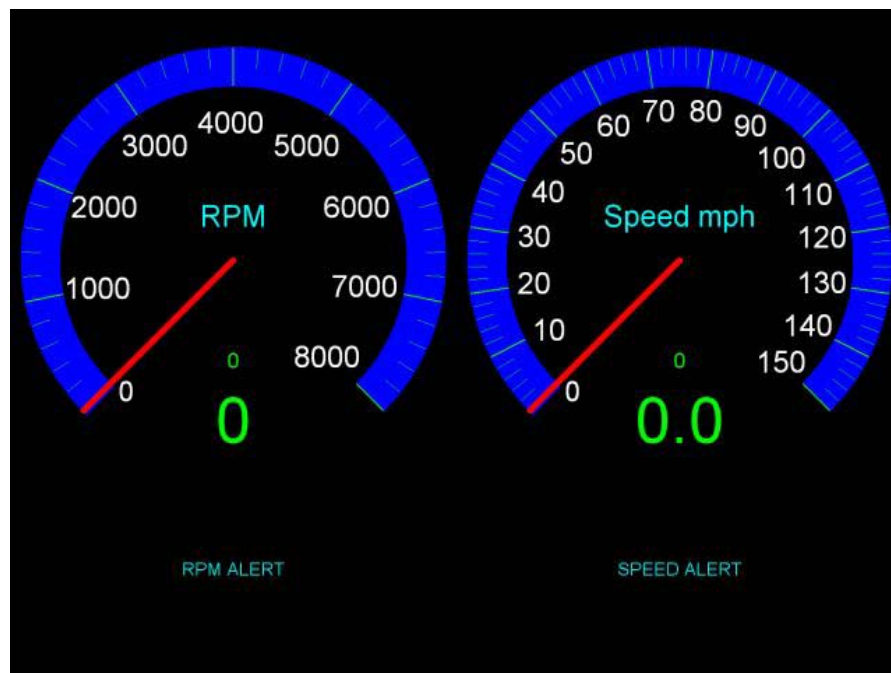
**Data Logging** – This screen allows the user to select what vehicle functions to log to a file. It also provides options for the log file name and location. When the *Start* button is clicked, the chosen parameters are monitored and logged to a comma delimited text file or CSV. This file can be graphed by Nissan Data Scan or opened in common spreadsheets such as Excel.



**Self Diagnostics** – The *Self Diagnostics* function reports any diagnostic codes present in the ECU. See Appendix A for a list codes for 88–94 & 95 Pathfinder, Quest, Truck & 300ZX. Other models are similar.



**Speed Trial** – This feature provides an accurate method to measure vehicle performance. Select the test to be performed and click *Activate*. When the program senses input from the ECU speed sensor circuitry that the starting speed has been reached it will begin timing. When the chosen upper limit is reached it will display the elapsed time for that test. (For accurate results the proper tire measurements must be input in the preferences panel as shown on page 6.)



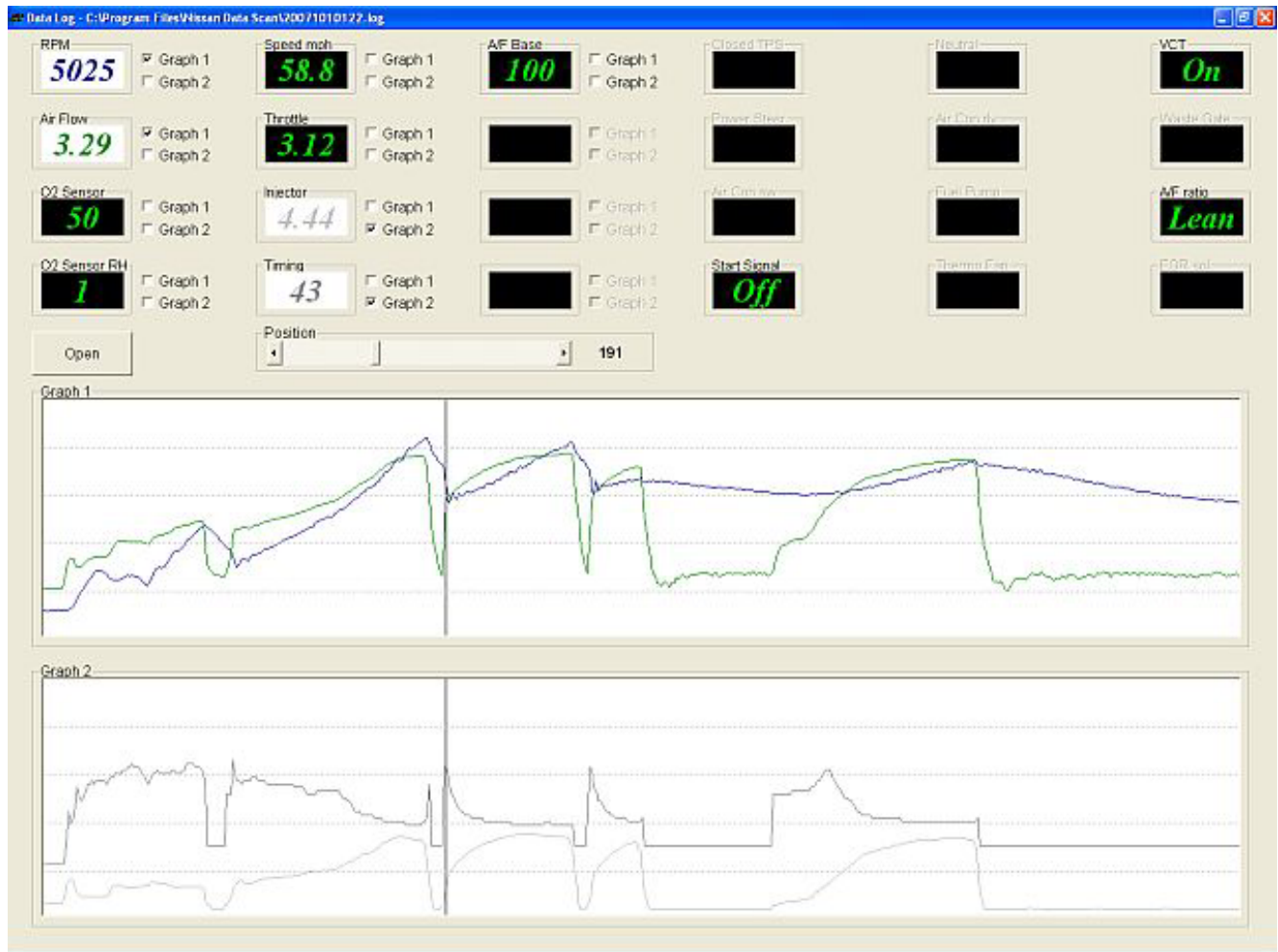
**Dashboard** – Selecting Dashboard will display the two gauges selected in the *Dashboard Settings* panel as shown on page 9. This display is a full screen display and makes it easy for the driver to monitor the chosen parameters without having to focus on the smaller gauges on the *Data Display* screen. If the preset alert values are reached, a colored box will appear next to the respective alert text.



**Data Replay** – Use the *Data Replay* function to “playback” a logged data file collected using the Data Logging option shown on page 11. The playback can be run at real time or stepped through using the sliders. An example of the usefulness of this tool might be checking the injector duty cycle at a given rpm or the airflow sensor voltage for a given rpm and mph.

The bottom left portion of the display monitors non-analog sensors or conditions. For example, the status of the VCT is displayed in red when VCT is active. Another option for reviewing log data is the *Log Analyzer* feature.

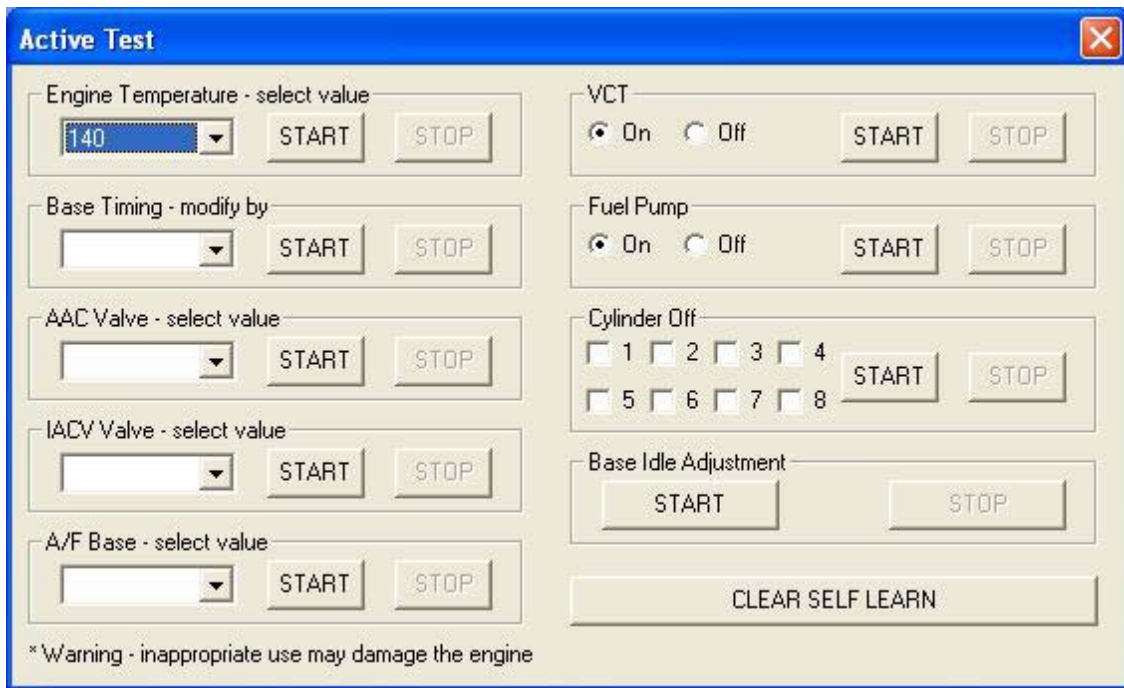




**Log Analyzer** – The *Log Analyzer* provides the ability for the user to graph logged data to compare readings similar to the Data Replay function. The graphical output is useful for evaluating the data in a more chronological fashion. Graphed logs can be evaluated for trends and compared for cause and effect determination.

The data to be graphed is displayed at the top. By checking the appropriate box the data can be graphed in either the top or bottom graph. Using this capability the logged parameters can be displayed in the most meaningful fashion.

Using the position slider, values for discrete time points may be compared.



**Active Test** – The *Active Test* panel allows the user to interact directly with the ECU. With this tool, control parameters can be overridden to evaluate engine system response to individual variables. For example setting the *Engine Temperature* to a particular value makes the ECU respond as if the temperature were actually that reading. This could be used to diagnose temperature sensor failures. If the engine is running very rich due to a sensor failure that has the ECU responding as if the car is not warmed up and in need of enrichment, then setting the temperature to a typical warmed up value would correct the rich condition and pinpoint the faulty sensor.

*Base Timing* is a base ignition timing as recommended by the manufacture. By increasing this value you are temporarily increasing timing across the whole timing map as if you were adjusting the CAS on your engine.

*AAC Valve* and *IACV Valve* control engine idle speed. Most Nissan cars are equipped with AAC or IACV valve. This function can be used to temporarily increase or decrease engine idle speed for trouble shooting purposes or by checking idle speed, verify that the units are functioning.

*A/F Base* is base fuel injection as programmed in the fuel map. By temporarily adjusting this value you are adding more fuel across the whole fuel map.

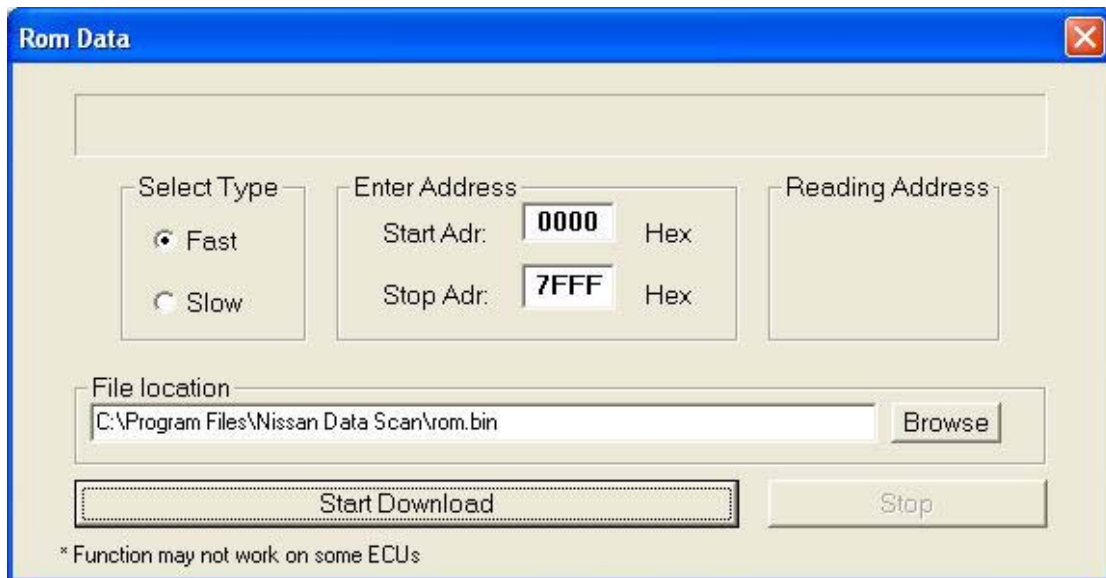
The *VCT* control manually activates the VCT solenoids to aid in diagnosing their function.

The *Fuel Pump* switch is one of the most frequently used features. Use it to shut off the pump with the car running to depressurize the fuel system before working on the fuel lines or injectors.

*Cylinder Off* is used to determine whether all cylinders are firing. Typically each cylinder's check box would be selected and clicking on the *Start* button will shut down that cylinder. If the rpms drop or the engine idle gets rougher then that particular cylinder is working. But if a cylinder is disabled and there is no change in engine running or idle quality, then that cylinder is faulty and further diagnosis needs to be made to determine if the issue is ignition or fuel delivery related.

*Base Idle Adjustment* provides a simple way of turning off the Idle Air Compensation valve to make it easy to set the base idle speed.

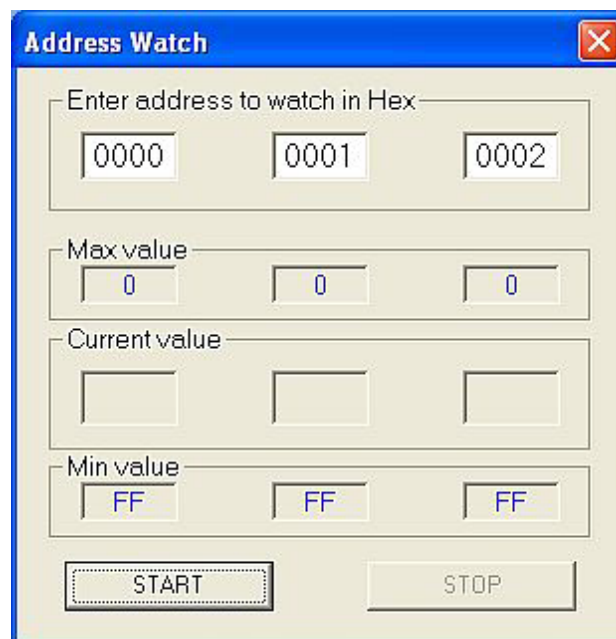
*Clear Self-Learn*. The ECU constantly monitors conditions and driving style and stores control data that it later uses when determining the proper values for parameters such as injector pulse width and timing. When tuning, it is often useful to clear these values to avoid skewed test results caused by the use of values stored before the tuning exercise.



The **Rom Data** dialog box is used for downloading ECU data. It features a title bar with a close button. The main area contains a large empty text box at the top. Below it, there are three sections: 'Select Type' with radio buttons for 'Fast' (selected) and 'Slow'; 'Enter Address' with 'Start Addr' set to '0000' and 'Stop Addr' set to '7FFF', both with 'Hex' labels; and a 'Reading Address' section. At the bottom, there is a 'File location' field with the path 'C:\Program Files\Nissan Data Scan\rom.bin' and a 'Browse' button. Below the file location is a 'Start Download' button and a 'Stop' button. A footnote at the bottom left states: '\* Function may not work on some ECUs'.

**Rom Data** – Use the *Rom Data* panel to download the data table portion of your ECU’s chip to a disk file. It is this file that is edited by Tuners to improve vehicle performance. Use the *Fast* option to download 8 bytes of data per ECU request. Use the *Slow* option to download 1 byte of data per ECU request. The slow option takes much longer but is more reliable. Use it only when the fast option times out or faults.

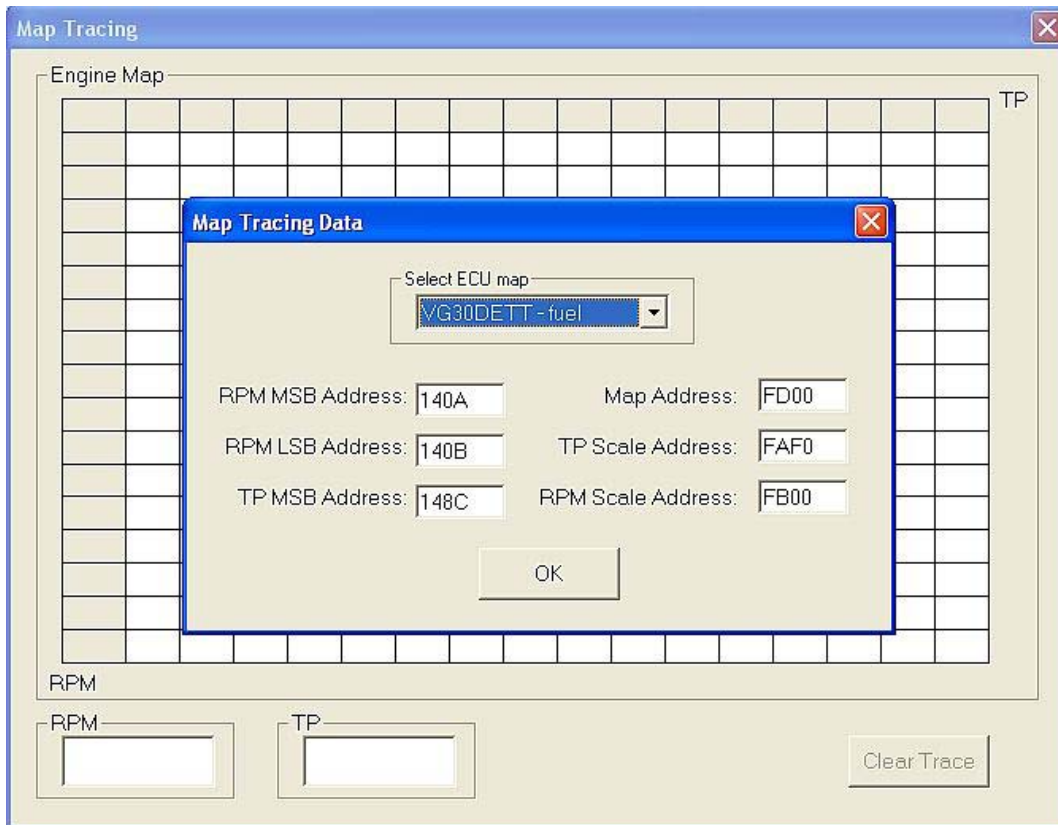
**NOTE:** To update the ECU with a modified program, the ECU must be socketed for the use of a chip that contains the new code. Nissan Data Scan does not provide a means to write or “burn” the new data to a new chip.



The **Address Watch** dialog box is used for monitoring specific address locations. It has a title bar with a close button. The main area contains a section 'Enter address to watch in Hex' with three input fields containing '0000', '0001', and '0002'. Below this are three rows of input fields: 'Max value' with three fields containing '0', 'Current value' with three empty fields, and 'Min value' with three fields containing 'FF'. At the bottom, there are 'START' and 'STOP' buttons.

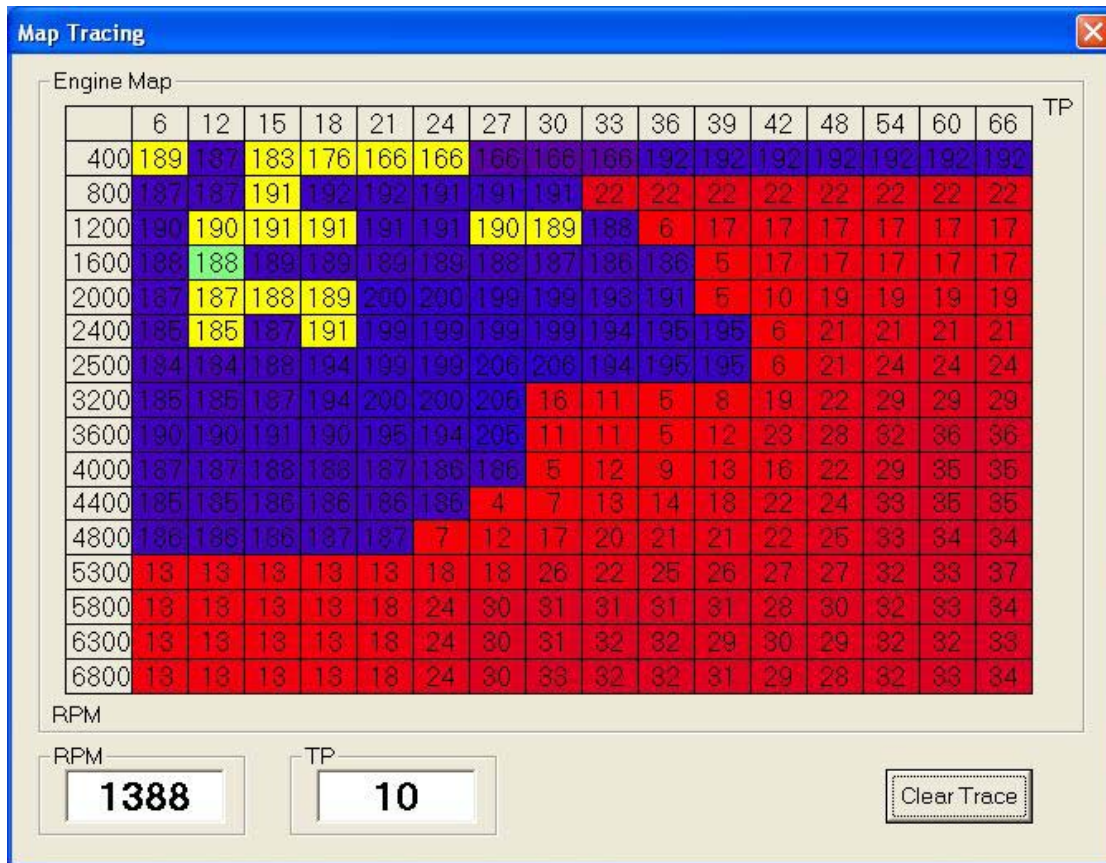
**Address Watch** – *Address Watch* is an advanced function. It is used to monitor specific address locations. This is often useful if a tuner needs to monitor a function not viewable by the other program options.





**Map Tracing** – *Map Tracing* refers to the ability to monitor the ECU directly in real time. The fuel and timing maps consist of a 2 dimensional grid whose blocks represent corresponding RPM and Theoretical Pulse Width Scale values. For a given RPM and Pulse width the chart provides a value to be used for the function controlled by the map. Fuel maps provide a target A/F ratio. Timing maps provide the desired ignition advance.

The first screen allows the selection of the map to be monitored. All addresses can be entered manually or predefined template can be selected from the drop down menu at the top. The NDS software remembers the last used setting next time the function is used. Some templates may not work on all ECUs but most of them do.



**Map Tracing Cont'd**– On the main *Map Tracing* display, the purple cells represent areas of the map that are closed loop. Closed loop refers to areas that the ECU uses O2 sensor readings to determine proper adjustments. The red areas are open loop where the ECU uses the map data directly.

## Appendix A

Code	
11	Crank Angle Sensor/CMP Sensor
12	Air Flow Meter/MAF Sensor
13	ECT Sensor
14	Vehicle Speed Sensor
21	Ignition Signal
22	Fuel Pump
23	Idle Switch (On/Off Diagnosis)
24	Throttle Valve Switch
25	ISC Valve
28	Cooling Fan Circuit (Overheat)
31	ECM
32	EGR Function
33	(Front)Oxygen Sensor
34 & 37	Knock Sensor
35	Exhaust Gas Temperature Sensor
36	EGRC-BPT Valve
38	LH Bank Closed Loop (B2)
41	Intake Air Temp Sensor
42	Fuel Temperature Sensor
43	TP Sensor
45	Injector Leak

47	CKP Sensor
51	Injector Circuit
53	Oxygen Sensor (RS)
54	A/T Control
55	No Malfunction
63	No. 6 Cylinder Misfire
64	No. 5 Cylinder Misfire
65	No. 4 Cylinder Misfire
66	No. 3 Cylinder Misfire
67	No. 2 Cylinder Misfire
68	No. 1 Cylinder Misfire
71	Random Misfire
72	TWC Function RH Bank
73	TWC Function LH Bank
76	Fuel Injection System Function RH Bank
77	Rear Oxygen Sensor Circuit
82	CKP Sensor
84	A/T Diagnosis Communication Line
85	VTC Solenoid Valve Circuit
86	Fuel Injection System Function LH Bank

87	Canister Control Solenoid Valve Circuit
91	Front Oxygen Sensor Heater Circuit RH Bank
94	TCC Solenoid Valve
95	CKP Sensor
98	ECT Sensor
101	Front Oxygen Sensor Heater Circuit LH Bank
103	PNP Switch Circuit
105	EGR And EGR Canister Control Solenoid Valve Circuit
108	Canister Purge Control Valve Circuit
—	Continuous Improper A/T Control Unit Voltage To ECM