



# DG Diagnostics

## User Manual



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## IMPORTANT

To ensure your success with this product, it is essential that you read this document carefully before using the hardware.

Damage caused by misuse of the hardware is not covered under product warranty. When using this manual, please remember the following:

- This manual may be changed, in whole or in part, without notice.
- DG assumes no responsibility for any damage resulting from the use of this hardware or software.
- Specifications presented herein are provided for illustration purposes only and may not accurately represent the latest revisions of hardware, software or cabling.
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DG understands that there are numerous safety hazards that cannot be foreseen, so we recommend that the user read and follow all safety messages in this manual, on all your shop equipment, from your vehicle manuals, as well as internal shop documents and operating procedures.

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## Safety First

It is essential that the user read this document carefully before using the hardware.

The DPA devices are to be used by those trained in the troubleshooting and diagnostics of light-duty through heavy-duty vehicles. The user is assumed to have a good understanding of the electronic systems contained on the vehicles and the potential hazards related to working in a shop-floor environment.

DG understands that there are numerous safety hazards that cannot be foreseen, so we recommend that the user read and follow all safety messages in this manual, on all your shop equipment, from your vehicle manuals, as well as internal shop documents and operating procedures.



- ❑ Always block drive, steer, and trailer wheels both front and back when testing.
- ❑ Use extreme caution when working around electricity. When diagnosing any vehicle, there is the risk of electric shock both from battery-level voltage, vehicle voltages, and from building voltage.
- ❑ Do not smoke or allow sparks or open flames near any part of the vehicle fueling system or vehicle batteries.
- ❑ Always work in an adequately ventilated area, and route vehicle exhaust outdoors.
- ❑ Do not use this product in an environment where fuel, fuel vapor, exhaust fumes, or other potentially hazardous liquids, solids, or gas/vapors could collect and/or possibly ignite, such as in an unventilated area or other confined space, including below-ground areas.

# Overview

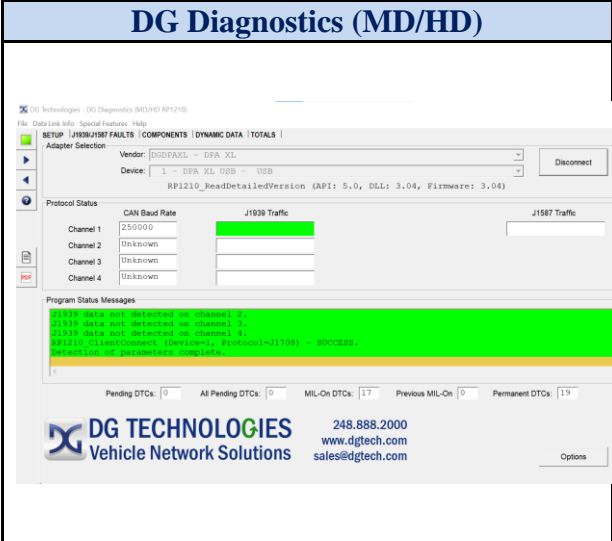
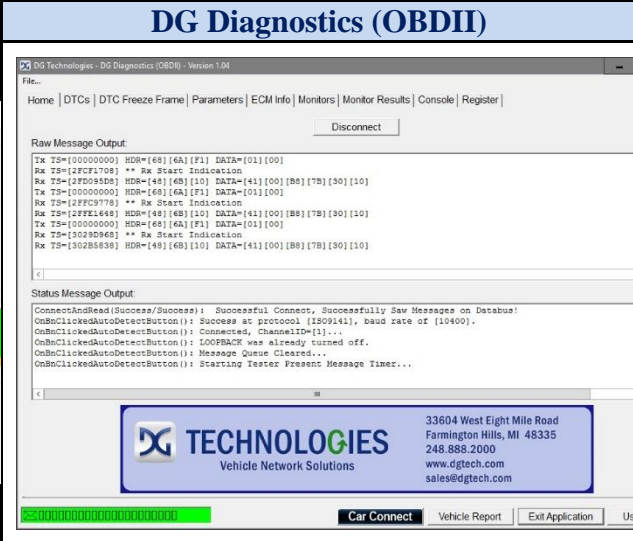
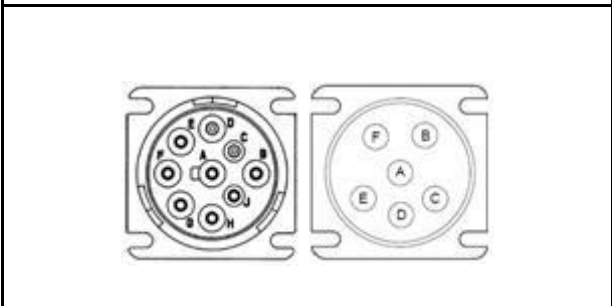
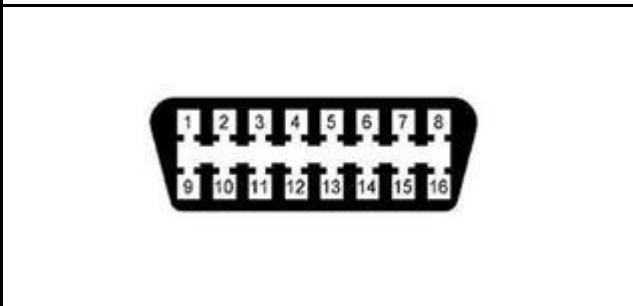
## DG Diagnostics Medium-Duty and Heavy-Duty (MD/HD) and DG Diagnostics (OBDII)

New to DG RP1210/J2534 device releases is a new member of the DG Diagnostics (DGD) application family. It is called DG Diagnostics (OBDII) and works with light and medium-duty vehicles.

Now, by purchasing a DG diagnostic adapter with J2534 compliancy, you have the capability to work on any light-duty through heavy-duty vehicle. DG Diagnostics consists of Diagnostic Triage software functionality to support service bay repairs across multiple vehicle platforms including off-highway, agricultural, and industrial-stationary equipment.

**Note:** *If you have an older Ford you wish to work on, DG recommends using our VSI-2534 device. J1850 PWM is the protocol that was common on Ford vehicles prior to about 2005 (non-CAN-based). The VSI-2534 is the only DG tool that currently supports the J1850 PWM protocol.*

The DG Diagnostics application previously called DG Diagnostics or DGD that was written for the medium and heavy-duty vehicles using a Deutsch 6-pin or Deutsch 9-pin connector has been renamed DG Diagnostics (MD/HD).

<p>DG Diagnostics (MD/HD) is for use on Medium-Duty or Heavy-Duty vehicles and equipment using the J1708/J1587 and J1939 Protocols and the Deutsch 6 or 9-pin connectors.</p> <p>It also works on the new Volvo platform with the OBDII connector (see below).</p> <p>This software uses the TMC RP1210 API.</p>	<p>DG Diagnostics (OBDII) is for use on Light-Duty (Automotive) and Medium-Duty vehicles and equipment using any OBDII protocol and the OBDII connector.</p> <p>This software uses the SAE J2534 API.</p>
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## User Manual Location

This user manual is for DG Diagnostics (MD/HD) can be launched from the Help menu, the left sidebar button, or **F1** button. It is also available through the Windows Start Menu.

Use **F1** button for case sensitive help.

A separate user manual for the DG Diagnostics (OBDII) application is also available.

## Features

DG Diagnostics (MD/HD), herein referred to as DGD, is a highly useful, general-purpose diagnostics program provided free-of-charge to DG's RP1210 Vehicle Diagnostic Adapter (VDA) customers (such as the Dearborn Protocol Adapter).

**Note:** *DGD does not include proprietary OEM communication or proprietary fault codes.*

DGD provides the essentials needed in a generic J1708/J1587 and CAN/J1939 diagnostics program. DG Diagnostics is a great triage tool that can be ran immediately when connecting to a vehicle or industrial-stationary equipment. If faults or other displayed data suggest that running an OEM application is required, that OEM application can be started automatically from within DGD. Some high-level features are:

- Read and display SAE-defined J1587 and J1939 fault codes both in numeric and text form.
  - Request ECMs to clear those faults.
- Display Freeze Frame data that was recorded by a controller at the time of a fault condition.
- Display Total Vehicle and Total Trip data such as engine hours and fuel economy.
  - Request reset of J1939 Total Trip information (trip odometer, trip miles, trip fuel, etc.).

- Display J1587 and J1939 ECM component information such as VIN, Make, Model, Serial, and Unit Numbers.
- Monitor and display thousands of parameters from the J1587 and J1939 data buses.
- Create a viewable/printable/savable vehicle report (called the Truck Data Report) in HTML format.
- Display J1939 Engine Configuration data.
- Connect to a CAN/J1939 data bus using CAN automatic baud rate detection since vehicles will be moving from J1939@250k bps to J1939@500k bps in the coming years. DG Diagnostics also displays the baud rate detected.
- Record data for engineering analysis and play that data back internally, externally to the data bus, or both.

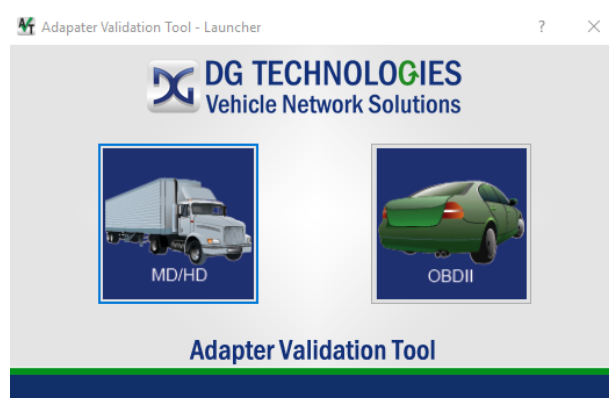
If you have a National Marine Electronics Association (NMEA) 0183 compliant GPS device, you can record GPS information (latitude, longitude, altitude) in with the data. If DG Diagnostics detects an internet connection, the location where the vehicle was at the time of capture can be displayed in the Map tab.

- Configure and launch OEM applications directly without having to navigate through the Windows Start Menu.
- Configure and launch PDF files, like the diagnostic PDF files that come from an OEM.
- DG Diagnostics works with a DPA 5 on 2013 (and newer) Volvo/Mack chassis with a Volvo engine (OBDII connector). It now works on the DPA XL also.
  - A DPA 5 and a special Volvo cable are necessary to perform vehicle diagnostics.

## DGD Configuration and Launch OEM Application

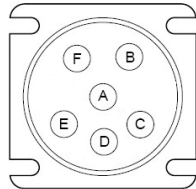
Once the tool is launched, you select the required application for your needs. Either:

- MD/HD SAE J1939
- LD OBD II SAE J1979



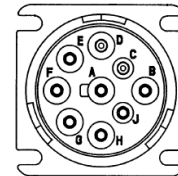
Startup

- Click on the MD/HD truck selection if you are connecting to a heavy duty or medium duty vehicle. The data bus protocols most often found on these vehicles include J1939, ISO15765 and J1708/J1587.
- Click on the OBDII car selection if are connecting to a light or medium-duty vehicles. The data bus protocols most often found on these vehicles include CAN/ISO15765, J1850, ISO9141, and ISO14230.



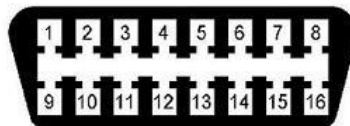
J1708 Connector (6-pin Deutsch)

This connector only has the J1708/J1587 protocol.



J1939 Connector (9-pin Deutsch)

OEMs switched to this connector when they moved to J1939. J1708 may not be available.



J1962 Connector

Most often found in light or medium duty vehicles.

Some heavy-duty vehicles also use this connector.

#### Vehicle Diagnostic Connectors

When the application launches, **click file to open** the configuration screen. From here its critical to **select the appropriate J2534 tool** under the device menu:

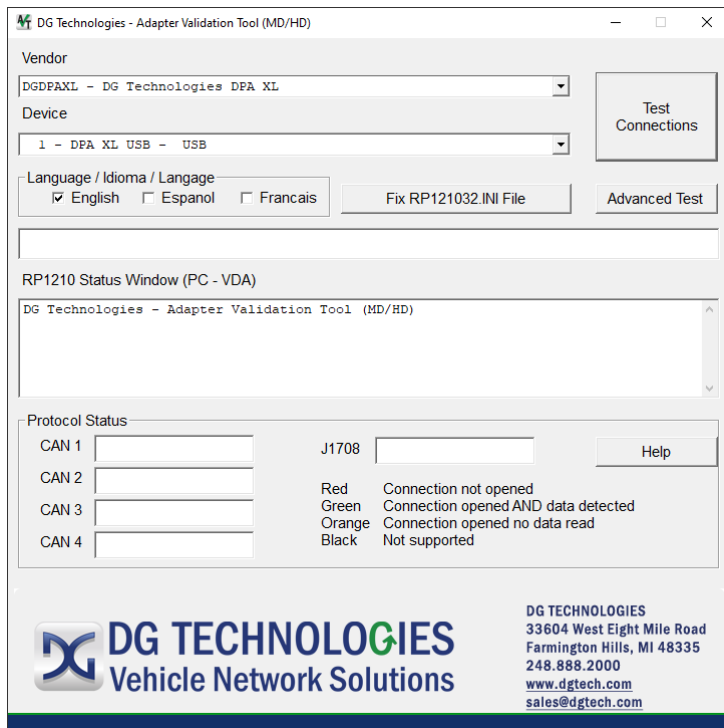
For the most part, the rest of the application auto fills the parameters necessary to communicate with the standard CAN.

If your **application differs**, you may need to **adjust some of the parameters** by simply clicking in the box and typing in the appropriate data.

Be sure to **press the save button once complete** -> the application will close and bring you back to the launch screen where you press the connect button.



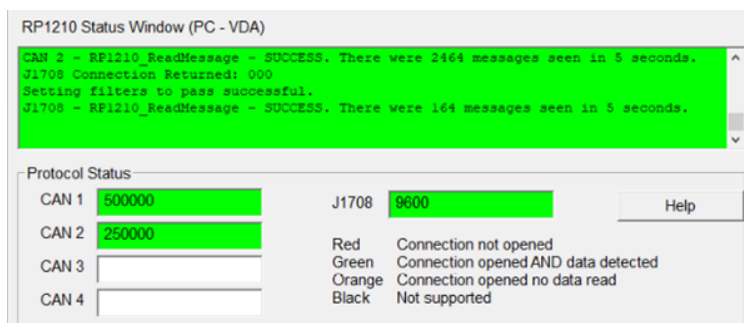
## AVT MD/HD Application



**Launch the HD application... Select the appropriate device.** Ensure that the vendor is correct and that the appropriate tool and link type is selected

**You will use a USB to connect.** Be careful as some of our tools can connect via Bluetooth. Simply hit the connect button and wait. This can take some time

**Initialization time is dependent on protocol and age of vehicle**



AVT HD - Green / Green

Green indicates the tool has initialized communication with whatever ECU you are trying to link to.

# Quick Start

## Install the Tool drivers

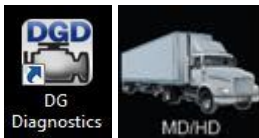
- Check for updates.
- The latest drivers can always be found at <https://www.dgtech.com/downloads/>

## Connect the Tool

- Connect the USB cable from the tool to the PC.
- Connect the vehicle cable to the Tool
- Connect the vehicle cable to the vehicle or equipment's diagnostic port.

## Launch DG Diagnostics

- Click on the DG Diagnostics shortcut on the desktop
- Select Medium-Duty and Heavy-Duty (MD/HD)



## Select Vendor

At the Main Dialog select vendor in Setup tab under Adapter Selection select:

- Vendor
- Device

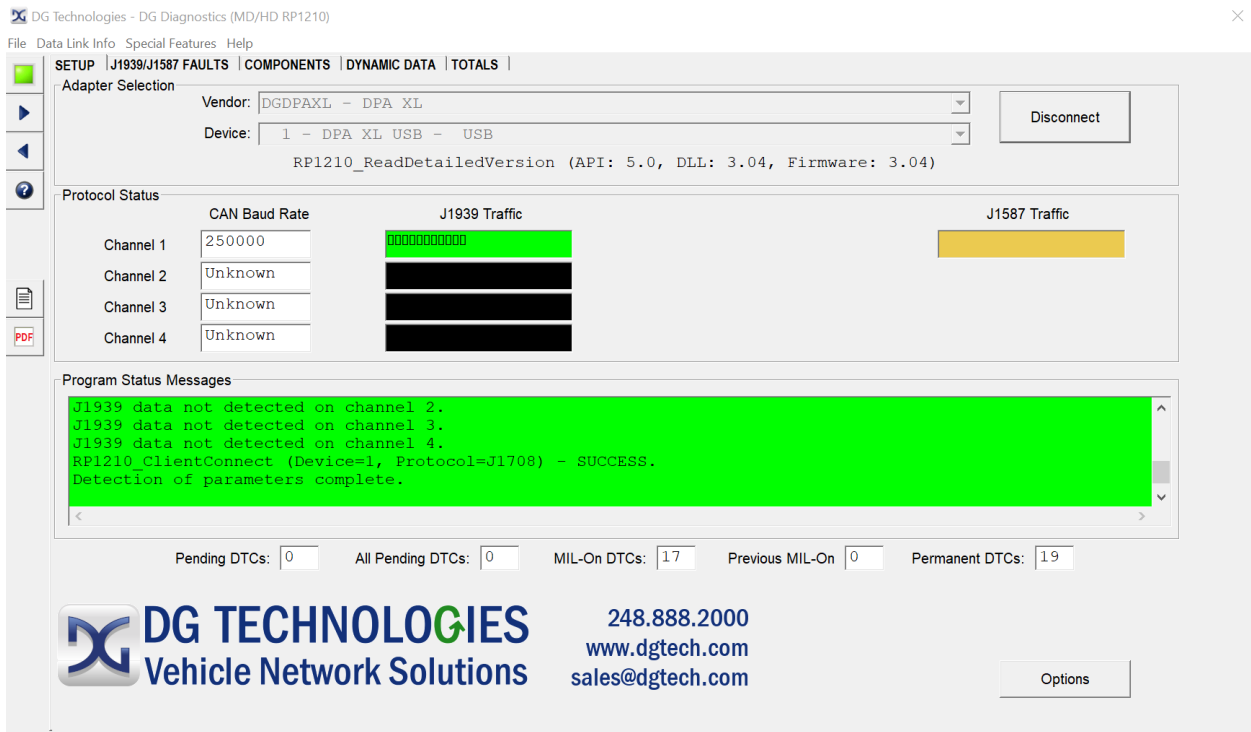


## Connect

Click on Connect button. On success, the Connection Button will turn green. Explore the data retrieved from your vehicle: Fault Codes, Components, Dynamic data and more. See the Main Dialog section for detailed description of all functionalities.






# Main Dialog

When the DG Diagnostics program is launched, the program defaults to the Setup tab. This is where you initiate and terminate your diagnostic session.



Menu Item		Description	
File	<b>Adapter Setup</b>	Initiate and terminate diagnostic session in Setup tab	
	<b>Truck Data Report</b>	Save the report as an HTML file. For more information see Truck Data Report section.	
	<b>Exit Application</b>	Exit	
Data Link Info	<b>Faults</b>	View J1939/J1587 Faults	Display J1939/J1587 Faults codes and descriptions
		View J2012 Faults	Open J2012 Faults dialog
		J1939 Freeze Frames	Data capture at the occurrence of a fault.
	<b>Record/Playback</b>	Control data recording and playback as well as logging of parameters	
	<b>PGNs/PIDs</b>	Display a list of all J1939 PGNs and J1708/J1587 PIDs	
	<b>Emissions</b>	Display Emissions-Related J1939 diagnostics data	
	<b>DEF/SCR</b>	J1939 Diesel exhaust fluid and selective catalytic reduction data	

	<b>Parameters</b>	Tree that displays decoded J1939 and J1587 parameters
	<b>Data Link Statistics</b>	Display various CAN/J1939 data bus statistics, such as bus loading and CAN errors
<b>Special Features</b>	<b>GPS Dongle Configuration</b>	Configure GPS
	<b>Mapping</b>	Display Map data when GPS is engaged
	<b>Launch OEM Application</b>	Launches the configured OEM Applications
	<b>Configure OEM Applications</b>	Set up your OEM applications
<b>Help</b>	<b>User's Manual</b>	Use <b>F1</b> button for case sensitive help.
	<b>Launch PDF</b>	Lunches desired PDF files. For more information see <b>Launch PDF</b> section.

Button	Name	Description
	Navigation Buttons	Navigate the tabs
	Help Button	Launches the DGD HD user's manual. This can be launched by pressing F1 or via the Help menu.
	Connection Buttons	Connect / Disconnect. Indicate connection status: Not connected, Connected, Connection Error. For more information see <b>Setup</b> section.
	<b>Truck Data Report</b> Button	Save the report as an HTML file. For more information see <b>Truck Data Report</b> section.
	<b>Launch PDF</b> Button	Lunch desired PDF files. For more information see <b>Launch PDF</b> section.

Tabs	Description
<b>Setup</b>	Initiate and terminate your diagnostic session
<b>J1939/J1587 Faults</b>	Display J1939/J1587 Faults codes and descriptions
<b>Components</b>	J1939/J1587 Component Information
<b>Dynamic Data</b>	Dynamic vehicle data
<b>Totals</b>	Total Trip/Non-Trip vehicle data
<b>Register</b>	DG Diagnostics registration
<b>Truck Data Report</b>	Save the report as an HTML file. For more information see <b>Truck Data Report</b> section
<b>J1939 Freeze Frames</b>	Data capture at the occurrence of a fault
<b>J2012 Faults</b>	Open J2012 Faults dialog
<b>Record/Playback</b>	Control data recording and playback as well as logging of parameters
<b>PGNs/PIDs</b>	Display a list of all J1939 PGNs and J1708/J1587 PIDs
<b>Emissions</b>	Display Emissions-Related J1939 diagnostics data
<b>DEF/SCR</b>	J1939 Diesel exhaust fluid and selective catalytic reduction data
<b>Parameters</b>	Tree that displays decoded J1939 and J1587 parameters

<b>Statistics</b>	Display various CAN/J1939 data bus statistics, such as bus loading and CAN errors
<b>GPS</b>	Configure GPS
<b>Map</b>	Display Map data when GPS is engaged
<b>OEM Apps</b>	Set up your OEM applications

## Setup

Use the Setup tab to initiate and terminate your diagnostic session.

**Note:** *The last adapter that you connected with will be saved, and DG Diagnostics will default to this adapter the next time you run the application.*

DG Technologies - DG Diagnostics (MD/HD RP1210)

File Data Link Info Special Features Help

SETUP | J1939/J1587 FAULTS | COMPONENTS | DYNAMIC DATA | TOTALS |

Adapter Selection

Vendor: DGDPAXL - DPA XL

Device: 1 - DPA XL USB - USB

RP1210\_ReadDetailedVersion (API: 5.0, DLL: 3.04, Firmware: 3.04)

Disconnect

Protocol Status

	CAN Baud Rate	J1939 Traffic	J1587 Traffic
Channel 1	250000	██████████████████	
Channel 2	Unknown		
Channel 3	Unknown		
Channel 4	Unknown		

Program Status Messages

```
J1939 data not detected on channel 2.
J1939 data not detected on channel 3.
J1939 data not detected on channel 4.
RP1210_ClientConnect (Device=1, Protocol=J1708) - SUCCESS.
Detection of parameters complete.
```

Pending DTCs: 0 All Pending DTCs: 0 MIL-On DTCs: 17 Previous MIL-On: 0 Permanent DTCs: 19

**DG TECHNOLOGIES**  
Vehicle Network Solutions

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www.dgtech.com  
sales@dgtech.com

Options

# Successful Connection

After a successful Connect and data is seen on a data bus, the fields on this form will slowly populate as the responses to applications requests come into the application (it could take 30 seconds or more). This screen is described in the following sections.

J1939 Component Information

ECU	ECU Description	VIN	Make	Model	Serial #	Unit #	
0	Engine #1	1FUJJC5CVX8HZ67124	CTRPL	C-15	19901008	SEFL-XX	
3	Transmission #1		ALLSN	4500	19940205	SEFL-YY	
11	Brakes - System Controller		WABCO	4S/4M	20050201	SEFL-ZZ	
28	Vehicle Navigation						
250	Off Board Diagnostic-Service Tool #2						

J1587 Component Information

MID	MID Description	VIN	Make	Model	Serial #	Unit #	St
128	Engine #1	1FUJJC5CVX8HZ67124	CTRPL	C-15	19901008	SEFL-XXXX	C
130	Transmission		ALLSN	4500	19940205	SEFL-YYYY	W
136	Brakes, Power Unit		WABCO	4S/4M	20050201	SEFL-ZZZZ	4S
162	Vehicle Navigation Unit						

Reset Lists

## Reset Lists Button

Pressing this button will wipe the current component information from the screen. The program will then go out and request new component information from the vehicle.

Pressing this button is a good way to determine if a J1939 controller has went into a CAN BUS\_OFF state and is no longer communicating (possibly a bad CAN chip in the component). If you let the screen populate for 20-30 seconds and press Reset Lists and the controller is not present, this may be the case. Turn the ignition key off and then turn it back on and see if the component reappears. If it does, it most likely has gone into a CAN BUS\_OFF state and needs to be diagnosed.

## J1939 Component Information Fields

This display grid shows information about the current vehicle and the controllers that are on the vehicle. Not all fields will be populated, as some controllers choose not to respond to the various requests for information. The fields are as follows:

J1939 Component Information

ECU	ECU Description	VIN	Make	Model	Serial #	Unit #
0	Engine #1	1FUJC5CVX8HZ67124	CTRPL	C-15	19901008	SEFL-XX
3	Transmission #1		ALLSN	4500	19940205	SEFL-YY
11	Brakes - System Controller		MERWB	4S/4M	20050201	SEFL-ZZ
28	Vehicle Navigation					
250	Off Board Diagnostic-Service Tool #2					

- ECU - J1939 Source Address of the Electronic Control Unit.
- ECU Description - Textual Representation for the ECU Field.
- VIN - Vehicle Identification Number.
- Make - TMC Vehicle Maintenance Reporting Standard (VMRS) Code for the Manufacturer of the Component.
- Model - Unique ID Number Assigned by the Manufacturer of the Component.
- Serial # - Unique Serial Number Assigned by the Manufacturer of the Component.
- Unit # - Sometimes Used by Fleets to Represent Asset (Door) Numbers.
- Software ID - Field Assigned by the Manufacturer of the Component to Indicate What Version of Software is Being Used by the Component.
- ECU Part # - Unique Number Assigned by the Manufacturer of the Component.
- ECU Serial # - Unique Serial Number Assigned by the Manufacturer of the Component.
- ECU Location - Location of the Controller
- ECU Type - Unique Field Assigned by the Manufacturer of the Component.

Pressing the Reset Lists button is a good way to determine if a J1939 controller has went into a CAN\_BUS\_OFF state and is no longer communicating (possibly a bad CAN chip in the component or a bad calibration). If you let the screen populate for 20-30 seconds and press Reset Lists and the controller is not present, this may be the case. Turn the ignition key off and then turn it back on and see if the component reappears. If it does, it most likely has gone into a CAN\_BUS\_OFF state and needs to be diagnosed.

## Vendor

Depending on which tool drivers you have installed, the field will display:

- DGDPA4XL – DPA XL
- DG121032 - Dearborn Group RP1210A

This entry covers the DPA 4 Plus and all prior DPA versions (II, III, III+, 4, etc.).

The DPA 4 and prior DPAs work with DG Diagnostics, but are no longer supported by DG.

- DPA4PMA - DPA 4 Plus Multi-Application

This entry is the latest driver set for the DPA 4 Plus.

- DGDPA5MA - DPA 5 Multi-Application

This entry is the driver set for the DPA 5 Dual CAN and DPA 5 PRO tools.

- SWDSDRP, SWDSARP, DGWDI32, WICE1210, DGWDI32, SP23WDS, WDS1210, RP1210WDS\_D, RP1210WDS-D

These are various iterations of diagnostic adapter APIs developed for the US Army.

Select the correct DPA drivers for the DPA you are going to use. Note that the DG Diagnostics program will only work with Dearborn Group Vehicle Diagnostic Adapters (VDAs).

## Device

Depending on the Vendor, the devices for that vendor appear in this list. Select the correct device number:

- DG121032 - 150 for USB, or the correct COM port if you have a serial port DPA
- DPA4PMA - 1 for USB
- DPA XL – 1 for USB
- DGDPA5MA - 1 for USB DPA 5 Dual CAN, 2 for USB DPA 5 PRO, or the correct Bluetooth DeviceID if connecting wirelessly

## Connect (Disconnect)

When clicking on the Connect button, the DG Diagnostics application will attempt to initiate a diagnostics connection on both the J1708/J1587 and CAN/J1939 data buses simultaneously using the Vendor and Device selected. A message will appear in the Status Message Display as to whether the connection was successful or not. If successful, the button will change to a Disconnect button.



When the Disconnect button is clicked, the diagnostics session on both the J1708/J1587 and CAN/J1939 data buses will be terminated. The button then changes back to a Connect button.

## Version Information

After a successful connection is created the version information will be presented in the Adapter Selection box.

## CAN Baud Rate Textbox

This text box displays the speed of the CAN data bus. A value of 250000 shows connection of CAN@250k, and a value of 500000 shows DG Diagnostics has connected to a J1939@500k data link.

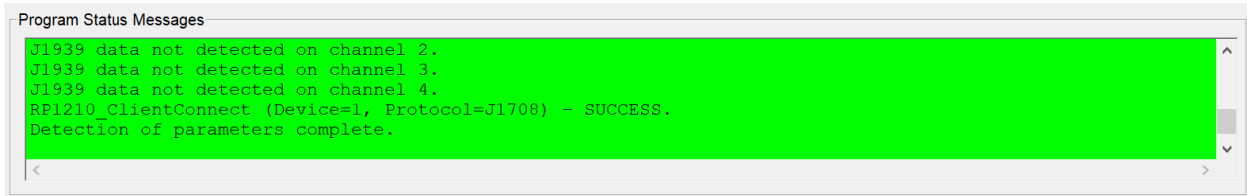
## J1587/J1939 Message Status

These show the J1587 and J1939 message status. As messages come in from the data bus, these fields indicate whether traffic is being seen on a bus or not. The edit boxes turn colors and move based on connection state:

State	Background Color
Initial - On Startup or After a Disconnect	White
Connect Successful, But No Data Has Been Seen	Amber
Connect Successful, Data Has Been Seen	Green
Connect Failed	Red
Connection Attempted Baud Rate Not Determined	Black

## Status Message Display

This window shows the status of the connections as they are opened.



```
Program Status Messages
J1939 data not detected on channel 2.
J1939 data not detected on channel 3.
J1939 data not detected on channel 4.
RP1210_ClientConnect (Device=1, Protocol=J1708) - SUCCESS.
Detection of parameters complete.
```

State	Background Color
Initial - On Startup or After a Disconnect	White
Connect to Both Buses Successful, Data Has Been Seen on Both Buses	Green
Connect Failed to Both J1939 and J1587 Data Buses	Red
All Other Conditions	Amber
Protocol Not Supported	Black

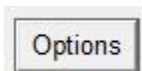
## DTC Counts Section

This information is provided in the J1939 Diagnostic Message DM29 - Regulated DTC Counts. This is a quick at-a-glance display of fault codes in each fault code category. If the DM29 message is not supported, these fields will remain blank.



Pending DTCs: 10    All Pending DTCs: 11    MIL-On DTCs: 12    Previous MIL-On: 13    Permanent DTCs: 14

## Options Button



This button (bottom right) displays various settings for the program. These options **SHOULD NOT BE CHANGED** unless under the direction of a DG representative. Modifying these options could have an impact on program performance and the data that is seen. If an option is changed, the program must be restarted to activate that change.

Send PGN/PID Request Messages:  1 = On (Default), 0 = Off (J1708/J1587 and J1939)

Seconds Between Request Message Cycles:  5 = Default Seconds (J1708/J1587 and J1939)

Milliseconds To Sleep After J1708 Request:  50 = Default Milliseconds (J1708/1587)

Save

Cancel

- Send PGN/PID Request Messages

This turns on/off requesting of J1939 or J1587 request messages that ask ECMs for data

- Seconds between Request Message Cycles

If requesting is on, this is the amount of time between requesting J1939 or J1587 data

- Milliseconds to Sleep after J1708 Request

J1587 messages are sent in a non-blocking fashion. The program needs to pause briefly after a request as to not overflow in the transmit queue. This is the amount of time to pause between each request.

## Fault Codes

DG Diagnostics provides SAE-defined fault codes:

J1939 / J1587 Faults

J1939 Freeze Frames

J2012 Faults

**Note:** *DG Diagnostics does not include OEM proprietary fault codes.*

### J1939/J1587 Faults

After a successful Connect and data is seen on a data bus, the fields on this form will slowly populate as the responses to DG Diagnostics requests come into the application (it could take 30 seconds or more).

**Note:** Not all vehicles and equipment will send SAE-defined faults on both the J1939 and J1587 data buses, and not all fault codes may be displayed in DG Diagnostics. DG Diagnostics can only display fault code messages that follow the SAE-defined J1939 and J1587 message formats.

OEMs have many proprietary fault codes that they do not publish on the generic J1939 and J1587 data buses and are only made available only through their diagnostic application or their heads up display/message center. Not showing a proprietary fault code is not a defect in the DG Diagnostics program.

J1939 Fault Codes J1939 Active Fault Lamps (DM1): Stop Lamp Warning Lamp MIL Lamp

Type	ECU	ECU Description	SPN	FMI	Count	SPN/FMI Description
A	0	Engine #1	1200	12	5	Anti-theft Desired Exit Mode States/Bad Intelligent Device Or Component
A	0	Engine #1	1201	12	5	Anti-theft Command States/Bad Intelligent Device Or Component
I	0	Engine #1	1200	12	5	Anti-theft Desired Exit Mode States/Bad Intelligent Device Or Component
I	0	Engine #1	1201	12	5	Anti-theft Command States/Bad Intelligent Device Or Component
EP	0	Engine #1	1200	12	5	Anti-theft Desired Exit Mode States/Bad Intelligent Device Or Component
EA	0	Engine #1	1200	12	5	Anti-theft Desired Exit Mode States/Bad Intelligent Device Or Component
EA	0	Engine #1	1201	12	5	Anti-theft Command States/Bad Intelligent Device Or Component
EI	0	Engine #1	1200	12	5	Anti-theft Desired Exit Mode States/Bad Intelligent Device Or Component
EI	0	Engine #1	1201	12	5	Anti-theft Command States/Bad Intelligent Device Or Component

### A) J1939 Fault Lamps (DM1)

J1939 Fault Lamps - From DM1 Active Diagnostic Trouble Codes

J1939 Active Fault Lamps (DM1): Stop Lamp Warning Lamp MIL Lamp

There are three fault lamps (which are initially white, but will illuminate if turned on by a vehicle controller) and these lights are turned on by the DM1 Active Diagnostic Trouble Code (DM1) message:

- Stop Lamp (red)  
This lamp is used to relay trouble code information that is of a severe enough condition that it warrants stopping the vehicle or equipment. Most vehicle/equipment manufacturers populate this lamp on the dashboard or control panel.
- Warning Lamp (amber)  
This lamp is used to relay trouble code information that is reporting a problem with the vehicle system but the vehicle need not be immediately stopped. Most vehicle/equipment manufacturers populate this lamp on the dashboard or control panel.
- MIL Lamp (amber)  
A lamp used to relay only emissions-related trouble code information. This lamp is illuminated when there is an emission-related trouble code active and is mandatory on the dashboard or control panel.

### Trailer ABS Fault Lamp

Trailer ABS Fault

This lamp will come on if the tractor is connected to a trailer with a PLC4TRUCKS ABS and the trailer ABS is in a fault condition. This will happen only if the PLC4TRUCKS fault messages are being relayed from the PLC bus to the J1708/J1587 data bus by the tractor ABS or a device like a DG PLC TestCon.

## B) J1939 Fault Code Fields

J1939 Fault Codes			J1939 Active Fault Lamps (DM1):			
Type	ECU	ECU Description	SPN	FMI	Count	SPN/FMI Description
A	0	Engine #1	1200	12	5	Anti-theft Desired Exit Mode States/Bad Intelligent Device Or Component
A	0	Engine #1	1201	12	5	Anti-theft Command States/Bad Intelligent Device Or Component
I	0	Engine #1	1200	12	5	Anti-theft Desired Exit Mode States/Bad Intelligent Device Or Component
I	0	Engine #1	1201	12	5	Anti-theft Command States/Bad Intelligent Device Or Component
EP	0	Engine #1	1200	12	5	Anti-theft Desired Exit Mode States/Bad Intelligent Device Or Component
EA	0	Engine #1	1200	12	5	Anti-theft Desired Exit Mode States/Bad Intelligent Device Or Component
EA	0	Engine #1	1201	12	5	Anti-theft Command States/Bad Intelligent Device Or Component
EI	0	Engine #1	1200	12	5	Anti-theft Desired Exit Mode States/Bad Intelligent Device Or Component
EI	0	Engine #1	1201	12	5	Anti-theft Command States/Bad Intelligent Device Or Component

The fields in the grid are as follows:

- Type - See table above for fault types and their display in this field.
- ECU - J1939 Source Address of the Electronic Control Unit.
- ECU Description - Textual Representation for the ECU Field.
- SPN - Fault Code Number (a.k.a. Suspect Parameter Number).
- FMI - Failure Mode Indicator  
What triggered the SPN
- Count - How Many Times This Fault Has Occurred.
- SPN/FMI Description - Textual Representation of the SPN/FMI.

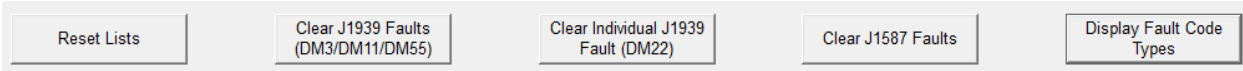
In the next 9 fields, a “1” indicates that the ECU is requesting that the specific lamp (as defined by SAE J1939-73) be illuminated on the dashboard, or control panel (if that specific light exists). A “0” indicates that the light was not being requested. It is good to know which component is actually requesting that a particular lamp be illuminated.

- MIL - Malfunction Indicator Lamp.  
A lamp used to relay only emissions-related trouble code information. This lamp is illuminated when there is an emission-related trouble code active.
- RSL - Red Stop Lamp.  
This lamp is used to relay trouble code information that is of a severe enough condition that it warrants stopping the vehicle or equipment. Most equipment manufacturers populate this lamp on the dashboard or control panel.
- AWL - Amber Warning Lamp.  
This lamp is used to relay trouble code information that is reporting a problem with the vehicle system but the vehicle need not be immediately stopped. Most equipment manufacturers populate this lamp on the dashboard or control panel.
- PL - Protect Lamp.  
This lamp is used to relay trouble code information with a vehicle system that is most probably not electronic subsystem related.
- fMIL - Flashing Malfunction Indicator Lamp.
- fRSL - Flashing Red Stop Lamp.
- fAWL - Flashing Amber Warning Lamp.
- fPL - Flashing Protect Lamp.  
See J1939-73 Table 5 for detailed description of how these various lights are defined and used.



For more information, see the SAE J1587 specification.

#### D) Fault Code (DTC) Buttons



##### Reset Lists

Pressing this button will wipe the current fault codes from the screen. The program will then request fault codes from the vehicle again.

##### Clear J1939 Faults (DM3/DM11/DM55) Button

The Clear J1939 Faults (DM3/DM11/DM55) button will request that all fault codes and OBD monitor information be cleared from all controllers. For more detailed information on what each DM clears, refer to J1939/73. This request goes out to the global J1939 address (255) as well as being sent to each individual ECU address (some controllers have failed to respond to the global address over the years).

This button also sends out a DM11 and DM55 message (Diagnostic Data Clear/Reset for Active DTCs) to the global J1939 address (255) as well as is sent to each individual ECU address. For OBD regulated products, DM11 and DM55 are used to clear all applicable diagnostic data. Emission related components shall clear/reset diagnostic data for all active, pending, and previously active DTCs. For more information, see the J1939-73 document.

**Note:** *Clearing faults is a request that some ECUs do not honor. This is not a defect in the DG Diagnostics program.*

##### Clear Individual J1939 Faults (DM22) Button

This button allows a user to send a DM22 message to request a clear of one specific SPN/FMI (Active or Inactive DTC/Fault) using the J1939 DM22 message. Typically pressing the Clear J1939 Faults (DM3/DM11/DM55) button will be what users do most, however an individual may be asked to press this button by their OEM or a technician may need to leave other fault codes intact.

Select the Clear Active or Clear Inactive entry, enter your source address (typically 249 - Offboard PC #1), the destination address (0 - Engine, 3 - Transmission, 11 - ABS), and the SPN/FMI to clear. The response from the ECM will appear below after pressing the Send button. Refer to your J1939/73 document for more information on the DM22 message.

#### **Clear J1587 Faults Button**

The Clear J1587 Faults button will request that the Inactive fault codes be cleared from all of the controllers.

**Note:** *Clearing faults is a request that some ECUs do not honor. This is not a defect in the DG Diagnostics program.*

#### **Display Fault Code Types Button**

Some J1939 Diagnostic Trouble Codes have lengthy descriptions as required by emissions regulations and legislation. The following documents the acronyms associated with each particular J1939 Diagnostic Message (DM) type.



You can press the Display Fault Code Types button to see a list of the code descriptions.

Display in Type Field	J1939 DM	J1939 Definition of Diagnostic Message
A	DM1	Active Diagnostic Trouble Codes (DTCs)
I	DM2	Previously Active Diagnostic Trouble Codes (DTCs)
EP	DM6	Emission Related Pending DTCs
EA	DM12	Emissions Related Active DTCs
EI	DM23	Emission Related Previously Active DTCs
AP	DM27	All Pending DTCs
PT	DM28	Permanent DTCs
IFS	DM35	Immediate Fault Status
A,P	DM41	DTCs- A, Pending
A,CA	DM42	DTCs- A Confirmed and Active
A,PA	DM43	DTCs- A, Previously Active
B1,P	DM44	DTCs- B1, Pending
B1,CA	DM45	DTCs- B1, Confirmed and Active
B1,PA	DM46	DTCs- B1, Previously Active
B2,P	DM47	DTCs- B2, Pending
B2,CA	DM48	DTCs- B2, Confirmed and Active
B2,PA	DM49	DTCs- B2, Previously Active
C,P	DM50	DTCs- C, Pending
C,CA	DM51	DTCs- C, Confirmed and Active
C,PA	DM52	DTCs- C, Previously Active
A-SO	DM53	Active Service Only DTCs
I-SO	DM54	Previously Active Service Only DTCs

## J1939 Freeze Frames

This tab will display any J1939 freeze frames faults for controllers having faults. This information comes from the DM4 and DM25 messages. The bottom box is for J1939 Expanded Freeze Frames (EFF). OEMs may be interested in the data contained in the SPN Data field of the EFF.

For more information on DM4/DM25 or the fields displayed on this tab, see the J1939-73 document.

J1939 Fault Code Freeze Frames (DM4)										
SRC	SPN	FMI	OC	Torque Mode	Boost kPa	Boost PSI	Eng Speed	Eng %Load	Eng Cool Temp C	Eng Cool Tem
0	1200	12	15	Not available	480.0000	69.6181	150.0000	15.0000	60.0000	140.0000

J1939 Expanded Freeze Frames (DM25)					
SRC	EFF Len	SPN	FMI	OC	SPN Data
0	8	1200	12	15	[01][02][03][04]
0	7	1500	10	10	[05][06][07]

## J2012 Faults

Some OEMs, especially those that are active in the automotive sector will send fault codes in Automotive Format per the J1979 and J2012 standards (“P” codes, “B” codes, etc.). The table will be populated with the appropriate fault codes, and DG Diagnostics will display the code in text form (per the J2012 translation).

J2012 Diagnostic Trouble Codes (DTCs)				
SRC	Status	J2012 DTC	J2012 DTC Description	Count
3	A	B4321	Code B4321 not found	1
3	A	P1234	Code P1234 not found	15
3	I	U1234	Code U1234 not found	15







## Dynamic Data

This screen is used to view common dashboard type of parameters in both Metric and English units from both the J1939 and J1587 data buses.

**Note:** Not all vehicles will populate the screens in the same way, as some engines, transmissions, ABS systems and other controllers report different parameters than others. This is not a defect in the DG Diagnostics program. If a parameter is being sent, it will be displayed. If a parameter is not being sent, it cannot be displayed.

Dynamic Vehicle Data						
Parameter (J1939 PGN/J1587 PID)	J1939	J1587	Metric	J1939	J1587	English
Engine Speed (61444/190)	0.000		rpm	0.000		rpm
Vehicle Speed (65265/84)	0.000		kmh	0.0000		mph
Engine Temp (65262/110)	OOR_h		degrees_C	OOR_h		degrees_F
Engine Oil Pressure (65263/100)	0.000		kPA	0.0000		PSI
Transmission Temp (65272/177)	-50.031		degrees_C	-58.0563		degrees_F
Transmission Oil Pressure (65272/127)	N/A		kPa	N/A		PSI
Fuel Level 1 (65276/96)	N/A		Percent	N/A		Percent
Fuel Level 2 (65276/38)	N/A		Percent	N/A		Percent
Air Pressure (65198/46)			kpa			psi
Instant Fuel Economy (65266/184)	0.000		kmL	0.0000		mpg
Gear Selected (61445/162)	N		Gear	N		Gear
Gear Attained (61445/163)	NC		Gear	NC		Gear
Switched Voltage (65271/158)	N/A		Volts	N/A		Volts
Alternator Voltage (65271/167)	N/A		Volts	N/A		Volts
Battery Voltage (65271/168)	13.700		Volts	13.700		Volts
Accelerator Pedal Position (61443/91)	OOR_h		Percent	OOR_h		Percent
% Load (61443/92)	0.000		Percent	0.000		Percent
Fuel Temperature (65262/174)	N/A		degrees_C	N/A		degrees_F
Engine Air Inlet Temperature (65269/172)	N/A		degrees_C	N/A		degrees_F
Ambient Air Temperature (65269/171)	14.656		degrees_C	58.3813		degrees_F
Driveline Engaged (61442/560)	Disengaged	N/A	Status	Disengaged	N/A	Status
Torque Converter Lockup Engaged (61442/573)	Disengaged	N/A	Status	Disengaged	N/A	Status
Transmission Input Shaft Speed (61442/161)	0.000		rpm	0.000		rpm
Transmission Output Shaft Speed (61442/191)	0.000		rpm	0.000		rpm
% Clutch Slip (61442/522)	N/A	N/A	Percent	N/A	N/A	Percent
Latitude (Data Bus)			Degrees			Degrees
Longitude (Data Bus)			Degrees			Degrees
Altitude (Data Bus)			Meters			Meters
Latitude (GPS Receiver)			Degrees			Degrees
Longitude (GPS Receiver)			Degrees			Degrees
Turbo 1 Oil Pressure (65245/104)	N/A		kPA	N/A		PSI
Turbo 1 Speed (65245/103)	0.000		rpm	0.000		rpm
Turbo 1 Boost Pressure (65190/1127/102)			kPA			PSI

## Totals

This screen is used to view common total vehicle data and total trip data parameters in both Metric and English units from both the J1939 and J1587 data buses. It also allows a user to display the J1939 engine configuration message, which shows information about programmed torques and speed information.

**Note:** Not all vehicles will populate the screens in the same way, as some engines, transmissions, ABS systems and other controllers report different parameters than others. This is not a defect in the DG Diagnostics program. If a parameter is being sent, it will be displayed. If a parameter is not being sent, it cannot be displayed.

Total (Non-Trip) Vehicle Data

Parameter (J1939 PGN/J1587 PID)	J1939	J1587	Metric	J1939	J1587	English
Total Vehicle Hours (65255/246)	N/A		Hours	N/A		Hours
Total Engine Hours (65253/247)	1719.250		Hours	1719.250		Hours
Total Idle Hours (65244/235)	1098.300		Hours	1098.300		Hours
Total Idle Fuel Used (65244/236)	1855.500		Liters	490.1712		Gallons
High Resolution Vehicle Odometer (65217/NA)	8333.3750	N/A	Km	5178.1192	N/A	Miles
High Resolution Vehicle Trip Odometer (65217/NA)	8334.4100	N/A	Km	5178.7623	N/A	Miles
Vehicle Odometer (65248/245)	8333.375		Km	5178.1192		Miles
Vehicle Trip Odometer (65248/244)	8334.375		Km	5178.7405		Miles
Total Fuel Used (65257/250)	6401.000		Liters	1690.9653		Gallons
Total Trip Fuel Used (65257/182)	6377.500		Liters	1684.7573		Gallons
Average Fuel Economy (65266/185)	1.307		KmL	3.0734		mpg
Engine Total Average Fuel Economy (65101/NA)		N/A	kmL		N/A	mpg
Total DTC Hours (65255/246)	78.850		Hours	78.850		Hours

Total Trip Vehicle Data

Parameter	Metric	Units	English	Units
J1939.64888.3741 AT2TI Trip Fuel Used		Liters		Gallons
J1939.64888.3742 AT2TI Trip Active Regeneration Time		Seconds		Seconds
J1939.64888.3743 AT2TI Trip Disabled Time		Seconds		Seconds
J1939.64888.3744 AT2TI Trip Number of Active Regenerations		Count		Count
J1939.64888.3745 AT2TI Trip Passive Regeneration Time		Seconds		Seconds
J1939.64888.3746 AT2TI Trip Number of Passive Regenerations		Count		Count
J1939.64888.3747 AT2TI Trip Number of Active Regeneration Inhibit Requests		Count		Count
J1939.64888.3748 AT2TI Trip Number of Active Regeneration Manual Requests		Count		Count
J1939.64889.3733 AT1TI Trip Fuel Used		Liters		Gallons
J1939.64889.3734 AT1TI Trip Active Regeneration Time		Seconds		Seconds
J1939.64889.3735 AT1TI Trip Disabled Time		Seconds		Seconds
J1939.64889.3736 AT1TI Trip Number of Active Regenerations		Count		Count
J1939.64889.3737 AT1TI Trip Passive Regeneration Time		Seconds		Seconds
J1939.64889.3738 AT1TI Trip Number of Passive Regenerations		Count		Count
J1939.64889.3739 AT1TI Trip Number of Active Regeneration Inhibit Requests		Count		Count

Reset J1939 Trip Info

Display Engine Configuration (EC1)

## Display Engine Configuration (EC1) Button

Press the Display Engine Configuration (EC1) button and the following information dialog will be displayed. This data contains a lot of information depicting how the engine is configured. For more information on the EC1 message (PGN #65251), please refer to J1939-71.

J1939 Engine Configuration #1 (EC1)

J1939 Engine Configuration 1 (EC1)

Source Address	(0) - Engine #1
Engine Speed At Idle, Point 1	750.000 RPM
Engine Percent Torque At Idle, Point 1	57.000 %
Engine Speed At Point 2	1800.000 RPM
Engine Percent Torque At Point 2	46.000 %
Engine Speed At Point 3	925.000 RPM
Engine Percent Torque At Point 3	57.000 %
Engine Speed At Point 4	1100.000 RPM
Engine Percent Torque At Point 4	57.000 %
Engine Speed At Point 5	1800.000 RPM
Engine Percent Torque At Point 5	1970.000 %
Engine Speed At High Idle, Point 6	1970.000 RPM
Engine Gain (Kp) Of The Endspped Governor	N/A
Engine Reference Torque	1022.000 Nm
Engine Maximum Momentary Override Speed, Point 7	3015.000 RPM
Engine Maximum Momentary Override Time Limit	2.000 Seconds
Engine Requested Speed Control Range Lower Limit	700.000 RPM
Engine Requested Speed Control Range Upper Limit	1970.000 RPM
Engine Requested Torque Control Range Lower Limit	0.000 %
Engine Requested Torque Control Range Upper Limit	57.000 %
Engine Extended Range Requested Speed Control Range Upper Limit	1970.000 RPM
Engine Moment of Inertia	0.536 kg-m <sup>2</sup>
Engine Default Torque Limit	723.000 Nm

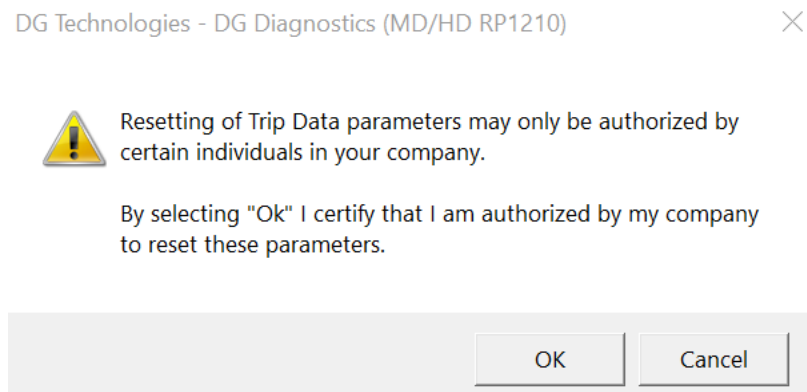
OK

## Reset J1939 Trip Info Button

Trip data is used by drivers and fleets to record data for a particular time frame (i.e., a trip). Resetting trip information is sometimes not permitted within a fleet except by certain personnel with certain permissions. When the Reset J1939 Trip Info button is pressed, the following WARNING box will appear. If you have permission to reset trip parameters, press Ok. Otherwise proceed at your own risk.

**Note:** *The command used to reset trip data (PGN 56832) is a REQUEST and the engine or other controllers storing trip data do not have to respond positively. Different vehicles will respond differently. Some engines require their diagnostics software to reset trip data. This is not a defect in DG Diagnostics. DG Diagnostics sends the correct message, but we cannot guarantee a positive response from the various onboard controllers.*

**Note:** *Trip reset is a J1939 only parameter. If a vehicle or engine is not on the J1939 data bus, executing this command will not work.*



After pressing OK, the Reset J1939 Trip 1 parameters screen should display. The top window will have all controllers that are transmitting on the data bus. The bottom window is informational, and IF THE RESET COMMAND WAS SUCCESSFUL AND ACCEPTED BY THE TRIP COMPUTER (most likely the engine) it will show all parameters that should be reset.



## J1939 Controllers and Trip 1 Reset Response

ECM	Description	Status
0	Engine #1	
3	Transmission #1	
11	Brakes - System Controller	

## Parameters (PGNs and SPNs) Affected by a J1939 Trip 1 Reset (PGN 56832 SPN 988)

Parameter Reset	PGN or SPN
Trip distance	SPN-0244
Trip fuel	SPN-0182
High resolution trip distance	SPN-0918
Trip compression brake distance	SPN-0990
Trip service brake applications	SPN-0993
Trip maximum engine speed	SPN-1013
Trip average engine speed	SPN-1014
Trip drive average load factor	SPN-1015
Trip average fuel rate	SPN-1029
Trip average fuel rate (Gaseous)	SPN-1031
Adjustment 4 Trip Fuel Used	SPN-0700

Reset J1939 Trip 1 Parameters

Close

When you press the Reset J1939 Trip 1 Parameters you will see the following box if no traffic has been detected on the J1939 data bus. After pressing OK, the program sends the RESET command. If no data has been seen, most likely the RESET is not going to work anyway.

## J1939 Controllers and Trip 1 Reset Response

ECM	Description	Status
0	Engine #1	ACK
3	Transmission #1	Sent
11	Brakes - System Controller	Sent

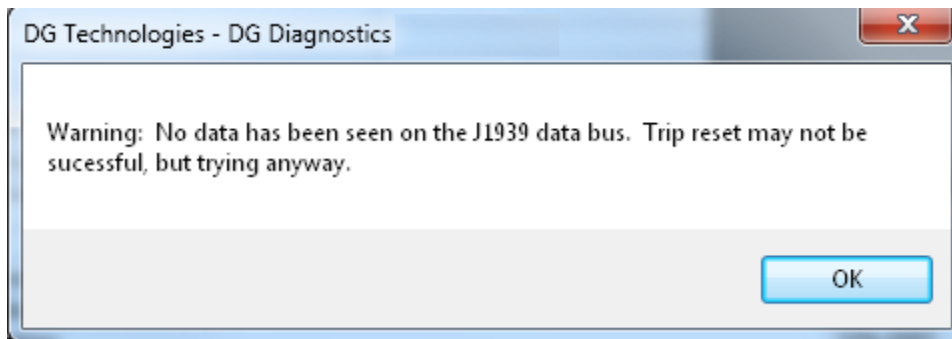
## Parameters (PGNs and SPNs) Affected by a J1939 Trip 1 Reset (PGN 56832 SPN 988)

Parameter Reset	PGN or SPN
Trip distance	SPN-0244
Trip fuel	SPN-0182
High resolution trip distance	SPN-0918
Trip compression brake distance	SPN-0990
Trip service brake applications	SPN-0993
Trip maximum engine speed	SPN-1013
Trip average engine speed	SPN-1014
Trip drive average load factor	SPN-1015
Trip average fuel rate	SPN-1029
Trip average fuel rate (Gaseous)	SPN-1031
Trip average fuel rate (Liquid)	SPN-1032

Reset J1939 Trip 1 Parameters

Close

When you press the Reset J1939 Trip 1 Parameters you will see the following box if no traffic has been detected on the J1939 data bus. After pressing Ok, the program sends the RESET command. If no data has been seen, most likely the RESET is not going to work anyway.

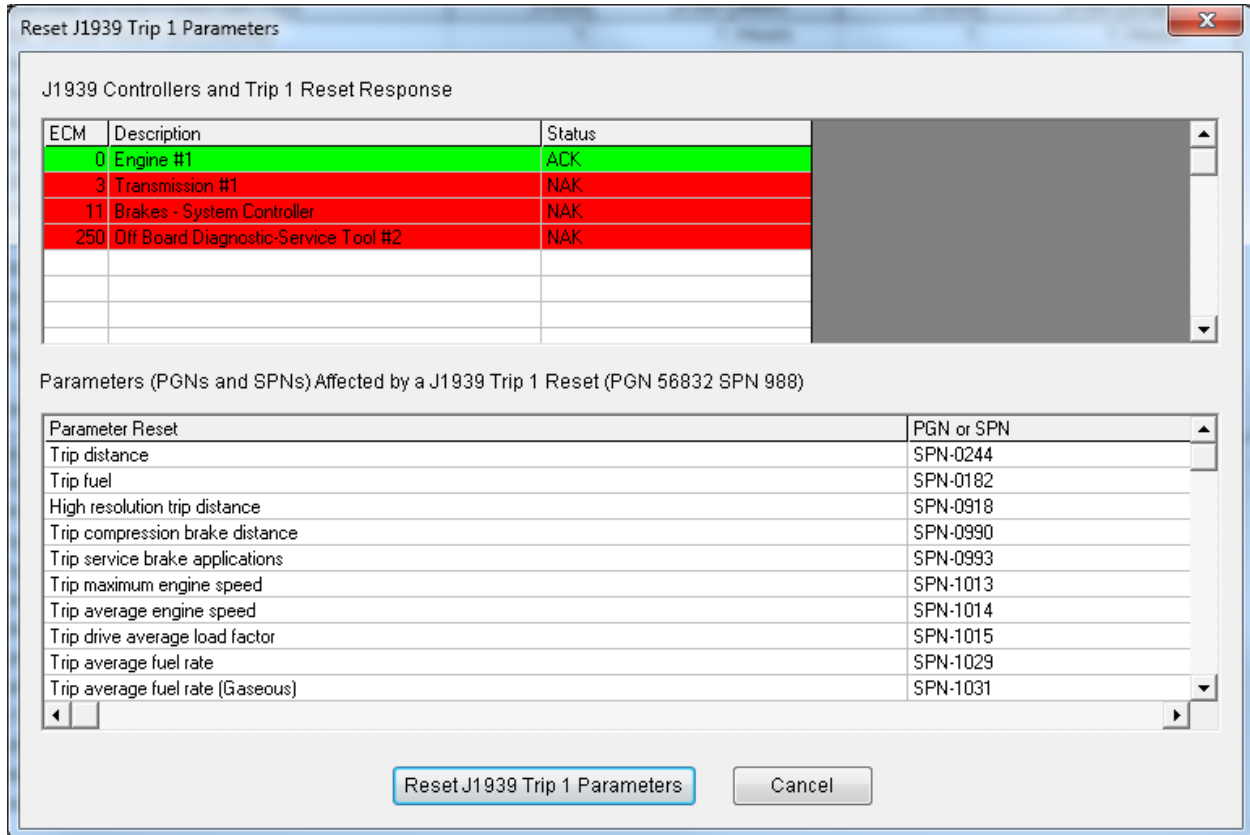


If traffic has been seen on the J1939 bus it immediately sends out the RESET command. The screen will show that the RESET command has been sent to all addresses that are transmitting on the J1939 data bus. As acknowledgment messages come in from the different controllers, the screen should look something like this.

**GREEN** means that the controller responsible for the resetting of trip parameters has agreed to reset them.

**RED** means they did not.

Normally, just the engine controller (ECM #0) will respond. If all controllers responded RED, then trip parameters cannot be reset and you will probably have to use an OEM diagnostics program to do so.



## Recording and Playback

Select menu item Data Link Info > Recording / Playback.

This screen is used to control data recording and playback as well as logging of parameters. The screen is set up into three sections: Recording, Playback, Logging of Parameters.

**Data Recording**

On    File Name: C:\DGTech\DGTech Utilities\DGD-Datalog.txt    Mark Log File

---

**Data Playback**

File Name: \_\_\_\_\_

Looping Playback     One-Shot Playback    Playback Method: Internal    % Timestamp Delay: 30

← \_\_\_\_\_ →

Latitude (DMS): \_\_\_\_\_ Longitude (DMS): \_\_\_\_\_ Altitude (M): \_\_\_\_\_

Satellites Used: \_\_\_\_\_ GPS Data Valid: \_\_\_\_\_ Date (UTC): \_\_\_\_\_ Time (UTC): \_\_\_\_\_

Playback GPS Data to COM Port    COM Port: COM3    Baud Rate: 4800

Ignore Marks During Playback    <<< Step    Play    Step >>>    Step Count (Msgs): 1

---

**Parameter Logging**

Off    File Name: 5000 Milliseconds    C:\DGTech\DGTech Utilities\DGD-Parameterlog.csv

## Data Recording

**Data Recording**

On    File Name: C:\DGTech\DGTech Utilities\DGD-Datalog.txt    Mark Log File

DG Diagnostics can record both J1939 and J1587 raw data messages to an ASCII text file of your choice. This file can then be played back, or examined/decoded by hand. This is unfiltered data, meaning it will log every message received and transmitted on the data bus (except for J1939 address claim messages).

The **Mark Log File** button which can mark a log file during recording. This way, if the user reaches a point, they want to highlight a circumstance (rough shift, etc.), the mark will allow the user to replay the recording and automatically stop at the point in time that the mark was written and view vehicle/equipment parameters.

- Click the File Name button to select which file the parameters will be logged to.
- Click the On/Off checkbox to turn data recording on or off (a check means On).

If you want GPS information in your log file, you must first start the GPS system (see the section on GPS and Mapping).

- If you need to mark the log file during recording, press the Mark Log File button.

The default data recording file is the same directory in which the DG Diagnostics executable resides and is named datalog.txt. For experienced databus engineers, the file format is very easy to parse programmatically or by hand, as seen below:

```
Rx J1939 TS= [40249] GPS=[3745.779400N_pc|-
8415.656400W_pc|284.00000M_pc|UNK|UNK|02/04/11_pc|23:43:07.000UTC_pc]
Chan= [ 1] EB=[off] PGN=[65217|0xFEC1] PF=[0xFE|254] PS=[PDU2-GE|0xC1|193]
HOW=[N/A] P= [3] SRC= [0] DST= [255] DL= [8] DATA-HEX [80][84] [1E][00][80][84]
[1E][00]
```

```
Rx J1708 TS= [40292] GPS=[3745.779400N_pc|-
8415.656400W_pc|284.00000M_pc|UNK|UNK|02/04/11_pc|23:43:07.000UTC_pc]
Chan= [2] EB=[off] MID=[128|0x80] PID=[246|0xF6] DL= [5] DATA-HEX
[04][14][00][00][00]
```

## Data Playback

This program can play back a data file that was recorded by DG Diagnostics. When playback is in progress, all fields in the program react to the data as if its DG Diagnostics were actually on the data bus when the data was being recorded. Therefore, you can record a fault scenario (such as a rough shift) and then send it to the transmission OEM, where they can see exactly what you were seeing and determine what happened. The program can playback the file in two ways (based on the Playback Method field):

- Internally to the Program

This method does not require a DPA. As mentioned before, someone else can record a file and you can watch the parameters on the various screens react to the data.

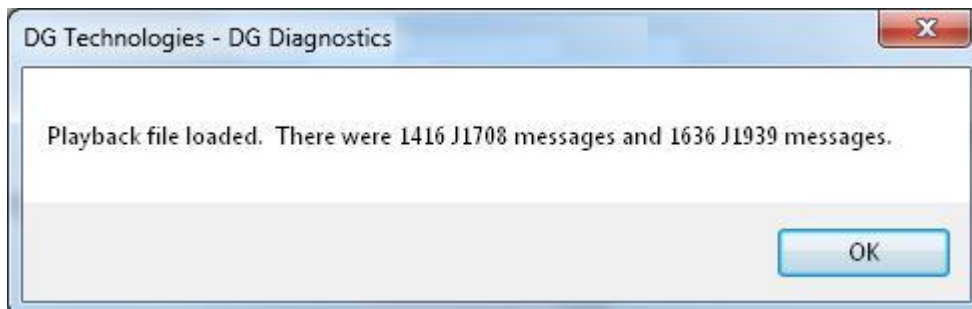
- Both Internally and Externally Through The DPA

This method requires a DPA connected and configured on the Home screen.

**Note:** You *must not be connected* to the data buses from the **Setup** tab. If you are, go to the Setup tab and disconnect before pressing the Play button on this screen.

### Steps to Playback

- Click the File Name button to select which file the program will playback from. A dialog box will appear stating how many messages were on both the J1587 and J1939 buses.



### Select Looping Playback or One-Shot Playback

Looping - When the program reaches the end of the data, playback starts again from the beginning.

One-Shot - When the program reaches the end of the data, playback stops.

- Select the Playback Method
- Press the Play button.

If successful in connecting, the scrollbar will move, the percentage box will display where the program is in the playback file (i.e., 47%), and the current

timestamp box will indicate what timestamp the program is currently on (i.e., TS=163846950).

**Note:** *During a playback session, all features of the program (data logging, parameter logging, reporting, launching of OEM applications) are active.*

### **Percentage of Timestamp Delay - Advanced Engineering Feature**

As messages are recorded, they are time-stamped by the DPA drivers. In a perfect world, when playing back the file, the program would calculate the amount of pause between the current message and the next message and then wait for that amount of time before putting the next message on the bus. The problem is that if you try and wait for that amount of time, you end up being late getting the message to the bus because of programmatic and operating system delays.

To make the playback appear as real-time as possible, you can configure the percent of the wait time. For example, if there were 500 milliseconds between two messages, the amount of sleep time that the program actually does is  $\text{DelayBetweenMessages} * \text{PercentageOfWaitTime}$ . If the percent of wait time was set to 20%, then the wait would be 100 milliseconds. We have found that about 30%-40% makes the playback externally look real, and 60%-70% makes playback internal look real.

### **GPS Data (Latitude, Longitude, Altitude, Date/Time, etc.)**

DG Diagnostics can be configured to use an external NMEA 0183 compliant device to record the GPS location in with logged data (**see GPS and Mapping** section). If a NMEA 0183 compliant device has been configured and is sending information before logging is invoked, then the GPS information will be placed in the log file. As DG Diagnostics reads that data from the file, it will show the pertinent GPS information and if the PC is connected to the Internet, it will display the Google map at the GPS coordinate for that data.

### **Playing Back GPS Data to Serial Port (RMC and GGA)**

Some developers of Telematics systems use DG Diagnostics with a NMEA 0183 compliant device to record GPS information in with the logged data. These developers use DG Diagnostics to play back that GPS information to a serial port to

simulate being connected to a NMEA 0183 compliant device. If you also want to do this, you select the **COM Port** and **Baud Rate** and then check the **Playback GPS Data to COM Port** radio button. DG Diagnostics will turn each message with GPS data into an RMC and GGA message sentences and transmit them on the COM port selected.

## Parameter Logging



Parameter Logging  
 Off    File Name    5000    MilliSeconds    C:\DGTech\DGTech Utilities\DGD-Parameterlog.csv

This program will record all monitored J1587 and J1939 parameters found on the **Totals** and **Dynamic Data** tabs to a Comma Separated Values (CSV) file of your choosing. This file can later be opened by Microsoft Excel or any other program that can handle reading of a CSV file.

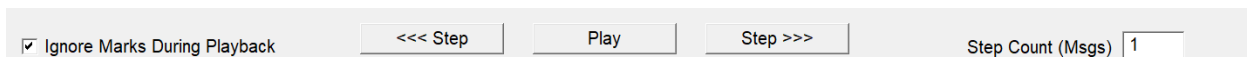
Some fleets with onboard computers are currently using this feature to record potential fuel theft situations, driver performance in general, as well as long idling periods.

- Click the On/Off checkbox to turn data recording on or off (a check means On).
- Click the File Name button to select which file the parameters will be logged to.
- Change the value in the Millisecond's edit box to reflect how often parameters are to be logged.

Previous versions of DG Diagnostics reacted at the second level. Some customers wanted to be able to log parameters more than once a second. In experiments, DG Diagnostics has successfully logged two to three times per second. It does generate a large CSV file, so use at the millisecond level only for short logging sessions.

The default data recording file is the same directory in which the DG Diagnostics executable resides and is named DGD-Parameterlog.csv.

## Advanced Playback - Marked Files



Ignore Marks During Playback    <<< Step    Play    Step >>>    Step Count (Msgs) 1

- Ignore Marks During Playback Checkbox



This field controls whether the program will stop at a Mark in the recorded file and ask permission to stop. If this is checked, the program will not stop at a user defined mark in the file.

- <<< Step (Rewind XXX Messages)

After the user has either manually stopped the playback of a file, or the user has hit a defined mark and has stopped the playback, this field will rewind back Step Count (Msgs) messages. This is a good way to go backward from a user defined mark to see events leading up to that mark.

- Step >>> (Fast Forward XXX Messages)

After the user has either manually stopped the playback of a file, or the user has hit a defined mark and has stopped the playback, this field will fast forward, Step Count (Msgs) messages.

- Step Count (Msgs)

This is the number of messages to step forward or backward during a playback using the rewind or fast forward (<<< Step, Step >>>) buttons.

## GPS and Mapping

DG Diagnostics can be configured to use an external NMEA 0183 compliant GPS device to record the GPS location in with logged data (See **GPS** and **Mapping** section). This makes it very easy for someone to log a fault or anomaly in a strange setting (i.e., at high altitude) where that fault might be intermittent and then send that data log back to the OEM to help remedy the situation. Also, the use of the GPS allows fleets to do driver tracking without having to have a more expensive tracking system on the vehicle.

**Note:** *The device (even though it may be a USB device) needs to be configured to a virtual COM port. The devices that DG Technologies used initially for the development of this feature are from the Pharos company, and these devices can be found in copies of Microsoft Streets and Trips for under USD\$75. When you install Streets and Trips, the installation automatically creates the virtual COM port. If you use another GPS device, refer to its manual on how to configure it into a COM port.*

## GPS

The GPS fields on this screen are defined below.

GPS Receiver Configuration

COM Port:  Baud Rate:  Lat/Long Display Format:

GPS Information

Latitude:  Satellites Used:  Satellite UTC Date:   
Longitude:  Satellites In View:  Satellite UTC Time:   
Altitude:  Data Valid:  Satellite Fix Quality:

RMC Message Seen  GGA Message Seen  GSV Message Seen

GPS Receiver and Status Messages

```
$GPGSV,2,1,07,03,32,158,32,06,37,137,21,07,01,276,,23,,28*48  
$GPGSV,2,2,07,29,03,032,35,30,60,044,28,31,26,076,39*43  
$GPGLL,3745.79923,N,08415.69694,W,160334.00,A,A*77
```

### COM port

This is where you configure the COM port that DG Diagnostics will read from your GPS device on.

### Baud Rate

NMEA calls for 4800 baud, however you can select a different baud rate if necessary. The parameters (N-8-1 for no parity bit, 8 data bits, and 1 stop bit) are assumed).

### Start/Stop GPS Tracking

This button opens/closes the COM port and initializes/terminates communications with the external GPS device.

### Lat/Long/Altitude Display Format

Different cultures and professions call for GPS data to be displayed differently. Some prefer RAW (as it appears from the GPS device), while others prefer only to display the degrees or degrees/minutes/seconds. DG Diagnostics lets you configure how you would like the latitude and longitude data to be displayed:

Dots	DMS
GPS Information	GPS Information
Latitude <input type="text" value="37.45.7776.N"/>	Latitude <input type="text" value="37d45m7785sN"/>
Longitude <input type="text" value="084.15.656.W"/>	Longitude <input type="text" value="084d15m656sW"/>

Degrees.Minutes.Seconds.N/S Latitude	Degrees"d"Minutes"m"Seconds"s"N/S Latitude
Degrees.Minutes.Seconds.E/W Longitude	Degrees"d"Minutes"m"Seconds"s"E/W Longitude

Decimal	Degrees
GPS Information Latitude <input type="text" value="3745.7759N"/> Longitude <input type="text" value="08415.6625W"/>	GPS Information Latitude <input type="text" value="37.76299"/> Longitude <input type="text" value="-084.26091"/>
Degrees, Minutes, Seconds as Defined by NMEA 0183 This is the RAW data format returned from the GPS.	Degrees only. Typical format used by mapping programs. A (-) negative sign in Latitude indicates South and in the Longitude field indicates West.

Altitude is always represented in meters.

#### Satellites Data, and Date/Time

Satellites Used:	<input type="text" value="4"/>	Satellite UTC Date:	<input type="text" value="04/07/11_gps"/>
Satellites In View:	<input type="text" value="11"/>	Satellite UTC Time:	<input type="text" value="17:57:48.145UTC_gps"/>
Data Valid:	<input type="text" value="Yes"/>	Satellite Fix Quality:	<input type="text" value="GPS Fix"/>

- Satellites Used is the number of satellites used for the GPS fix. This changes based on location.
- Satellites in View is the number of satellites currently in view of the GPS.
- Data Valid comes back from the GPS and tells whether or not it has enough information to give a good fix.
- Satellite Fix Quality comes from the GPS (GPS or Differential GPS).
- Date and Time called for in NMEA are defaulted to UTC time.

For more information on GPS devices, you can Google NMEA 0183, and you can also refer to Wikipedia regarding latitudes and longitudes.

#### RMC, GGA, and GSV

These check boxes indicate if the relevant messages from the satellite have been seen. RMC is the standard message that most GPS receivers translate, however the GGA and GSV messages provide more information. For more information on these sentences, you can Google NMEA 0183.

RMC Message Seen
  GGA Message Seen
  GSV Message Seen

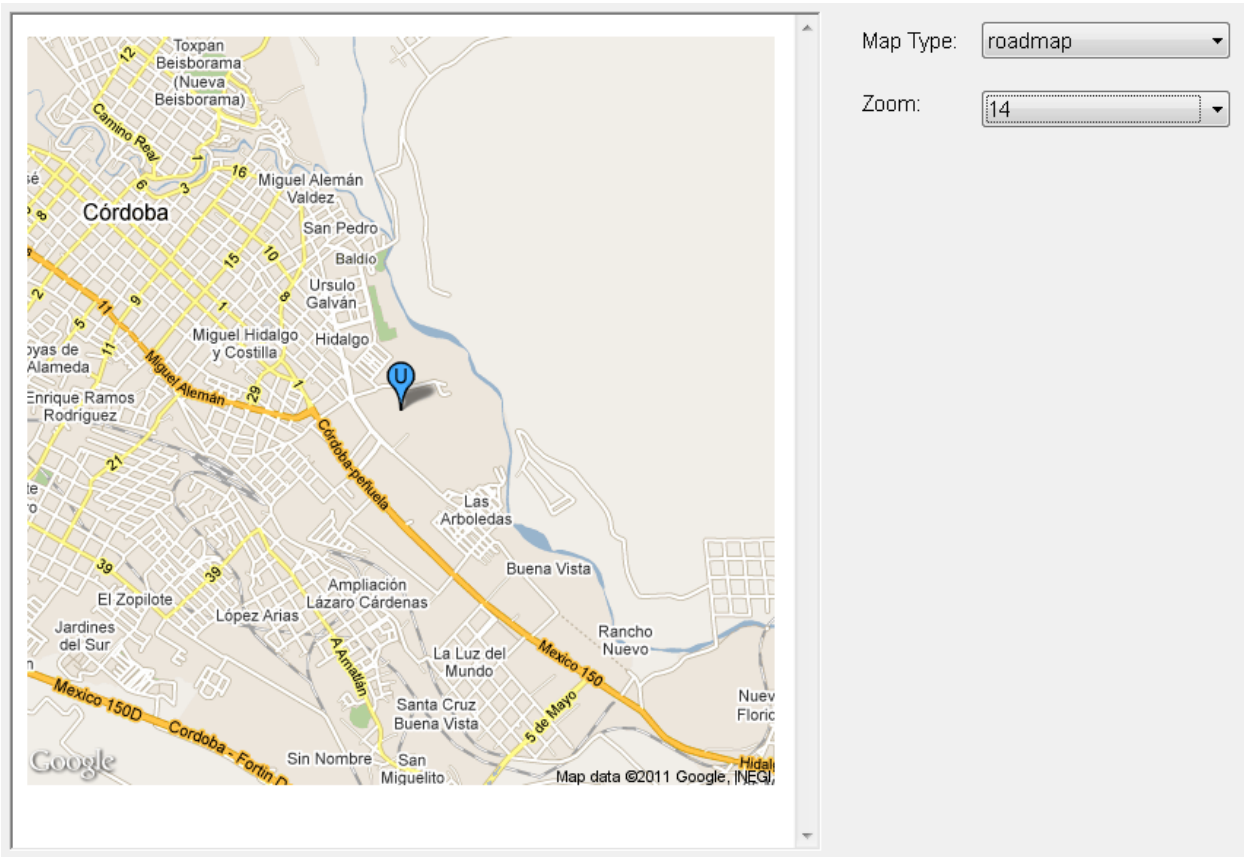
## GPS Receiver and Status Messages

This field shows the NMEA 0183 sentences coming from the GPS receiver. This is of not much use to the end-user; however, it does turn green if messages have been seen.

```
GPS Receiver and Status Messages
$GPGLL,3745.7788,N,08415.6546,W,175749.145,A*23
$GPGSA,A,3,18,09,12,25,,,,,,,,,5.9,4.7,3.5*3F
$GPRMC,175749.145,A,3745.7788,N,08415.6546,W,0.203531,315.72,070411,,*13
```

## Map

If you are connected to the internet while you engage the GPS system or start playing back of data that has GPS information in the data, DG Diagnostics will use the Google Maps Application Programming Interface (API) to display map data. There are different map types and different zoom levels that can be chosen. For more information on the mapping types (roadmap, satellite, terrain, and hybrid), you can Google "Google MAPS API". You can also control the zoom level.



## PGNs/PIDs

This screen will display a list of all J1939 PGNs and J1708/J1587 PIDs being broadcasted, those being sent in response to DGD requests, and the raw data associated with those PGNs and PIDs. The engine distributor that this screen was initially developed for has been asked several times by the engine manufacturer to view the raw data being sent and then hand decode the data bytes and provide feedback.

This screen provides several important features:

- Displays all J1939 PGNs being sent, along with the Source Address (SRC) and length of data packet.
- Displays all J1708/J1587 PIDs being sent, along with the Source Address (MID).
- The PIDs are individual PIDs instead of being shown in packed PID format. This way, individuals needing to hand-decode data will not have to unpack packed PID packets.
- The Pause button stops update of the screen. This allows a user to copy down the data and hand-decode a message when necessary.
- Request PGN button brings up a dialog box that can request a PGN from all controllers or a specific controller.
- Request PID button brings up a dialog box that can request a PID from all controllers.
- This data is also captured in the Truck Data Report, which can be printed, saved or e-mailed as necessary.
- This screen also addresses another need of DG customers, just obtaining a list of PGNs and PIDs that a vehicle sends.

J1939 SRC/PGN/Len/Data

SRC	PGN	Len	Data
0	59392	8	[00][FF][FF][FF][FF][00][DE][00]
0	61443	8	[FF][25][23][FF][FF][FF][FF][FF]
0	61444	8	[FF][FF][FF][E0][01][FF][FF][FF]
0	61445	8	[FF][FF][FF][FF][44][32][44][32]
0	64965	31	[43][31][35][2A][32][31][33][34][35][36][2A][4F][4E][48][49][47][48][57][41][59][2A][4F][4E][48][49][47][48][57][41]
0	65101	8	[FF][00][00][14][2E][73][00][2E]
0	65198	8	[2D][FF][FF][FF][FF][FF][FF][FF]
0	65203	8	[90][01][00][00][10][27][00][00]
0	65209	22	[FF][FF][FF][FF][58][02][00][00][20][03][00][00][FF][FF][FF][FF][FF][FF][FF][FF][FF]
0	65217	8	[80][84][1E][00][80][84][1E][00]
0	65226	8	[54][44][8B][02][01][1E][FF][FF]
0	65227	8	[54][44][8B][02][01][1E][FF][FF]

J1587 MID/PID/Len/Data

MID	PID	Len	Data
128	38	1	[62]
128	46	1	[32]
128	84	1	[3A]
128	91	1	[25]
128	92	1	[44]
128	96	1	[62]
128	100	1	[47]
128	110	1	[20]
128	158	2	[A0][00]
128	167	2	[A0][00]
128	168	2	[18][01]

Request PGN      Pause      Request PID

## Send Request for a PGN (59904) Dialog

Send Request for a PGN (59904) ×

Channel to send message on:  ▼

PGN to Request:  (in decimal)

Source Address To Use (SRC):  (in decimal)

Destination Address To Use (DST):  (in decimal, 255=GLOBAL\_ADDRESS)

This dialog box allows the user to request a J1939 PGN (PGN to Request field) using the J1939 Request PGN (59904) from all controllers (Destination Address to Use = 255), or from an individual controller (i.e., Engine: Destination Address to Use = 0).

Since some controllers may not respond to Offboard Diagnostics PC #1 (249), or Offboard Diagnostics PC #2 (250), you can also add the source address you would like to use for the request.

If a controller responds, the raw data will show up in the PGNs/PIDs tab, and in the Truck Data Report.

**Note:** *The PGN request dialog requests information. Some controllers may choose not to respond; therefore, the data may not show up in the grid. This is not a defect in the DG Diagnostics program.*

## Send Request for a PID (PID 0) Dialog

Send Request for a PID (PID 0) ×

PID to Request:  (in decimal)

Source Address To Use (MID):  (in decimal)

This dialog box allows the user to request a J1587 PID (PID to Request field) using the J1587 Request PID (0). This message will be sent to all controllers.

Since some controllers may not respond to Offboard Diagnostics PC #1 (172), you can also add the source address (MID) you would like to use for the request.

If a controller responds, the raw data will show up in the PGNs/PIDs tab, and in the **Truck Data Report**.

**Note:** The PID request dialog requests information. Some controllers may choose not to respond; therefore, the data may not show up in the grid. This is not a defect in the DG Diagnostics program.

## Emissions

DG Diagnostics can now display all Emissions-Related J1939 diagnostics data (minus the messages used for reflashing and calibration). This grid no longer displays emissions-faults; those are now on the **Fault tab**. This tab has evolved from previous versions and now displays data from the following PGNs:

DM5, DM10, DM21, DM26, DM56, DM57, DM31, DM32, DM33, DM34, DM36, DM37, DM38, DM39, DM40

MIL, Stop-Lamp, Warning-Lamp status from the DM12 message.

For more information on emissions-related faults and information, please refer to the J1939-73 document, or contact your vehicle or engine manufacturer.

DM.Parameter	Parameter Value
DM5.ECU/Source Address	0
DM5.Number of Active Faults	20
DM5.Number of Inactive Faults	1
DM5.OBD Compliance Value	0x14
DM5.OBD Compliance Description	Heavy Duty/On-Board Diagnostics (CARB CCR 1971.1 and EPA 86.010-18)
DM5.Cont. Monitored Systems Status/Support Value	0x07
DM5.Comprehensive Component Monitoring Support	Test Supported By This Controller
DM5.Fuel System Monitoring Support	Test Supported By This Controller
DM5.Misfire Monitoring Support	Test Supported By This Controller
DM5.Comprehensive Component Monitoring Status	Test Complete, Not Supported
DM5.Fuel System Monitoring Status	Test Complete, Not Supported
DM5.Misfire Monitoring Status	Test Complete, Not Supported
DM5.Non Cont. Monitored Systems Support Value	[0xA0][0x1E]
DM5.EGR VVT System Monitoring Support	Test Supported By This Controller
DM5.Exhaust Gas Sensor Heater Monitoring Support	Test Not Supported By This Controller
DM5.Exhaust Gas Sensor Monitoring Support	Test Supported By This Controller
DM5.AC System Refrigerant Monitoring Support	Test Not Supported By This Controller
DM5.Secondary Air System Monitoring Support	Test Not Supported By This Controller
DM5.Evaporative System Monitoring Support	Test Not Supported By This Controller
DM5.Heated Catalyst Monitoring Support	Test Not Supported By This Controller
DM5.Catalyst Monitoring Support	Test Not Supported By This Controller
DM5.NMHC Converting Catalyst Monitoring Support	Test Supported By This Controller
DM5.NOx Converting Catalyst And Or NOx Adsorber Monitoring Support	Test Supported By This Controller
DM5.Diesel Particulate Filter DPF Monitoring Support	Test Supported By This Controller
DM5.Boost Pressure Control System Monitoring Support	Test Supported By This Controller
DM5.Coldstart Aids System Monitoring Support	Test Not Supported By This Controller
DM5.Non Cont. Monitored Systems Status Value	[0x00][0x04]
DM5.EGR VVT System Monitoring Status	Test Complete, Not Supported

The Stop/Warning/MIL lamps act exactly the same as they do on the **Faults tab**, except they come from the DM12=Emissions-Related Active DTCs message.

Sometimes it is necessary to inform a technician dealing with engine monitors if the engine has been through a complete warm-up cycle. This is displayed in an edit box.

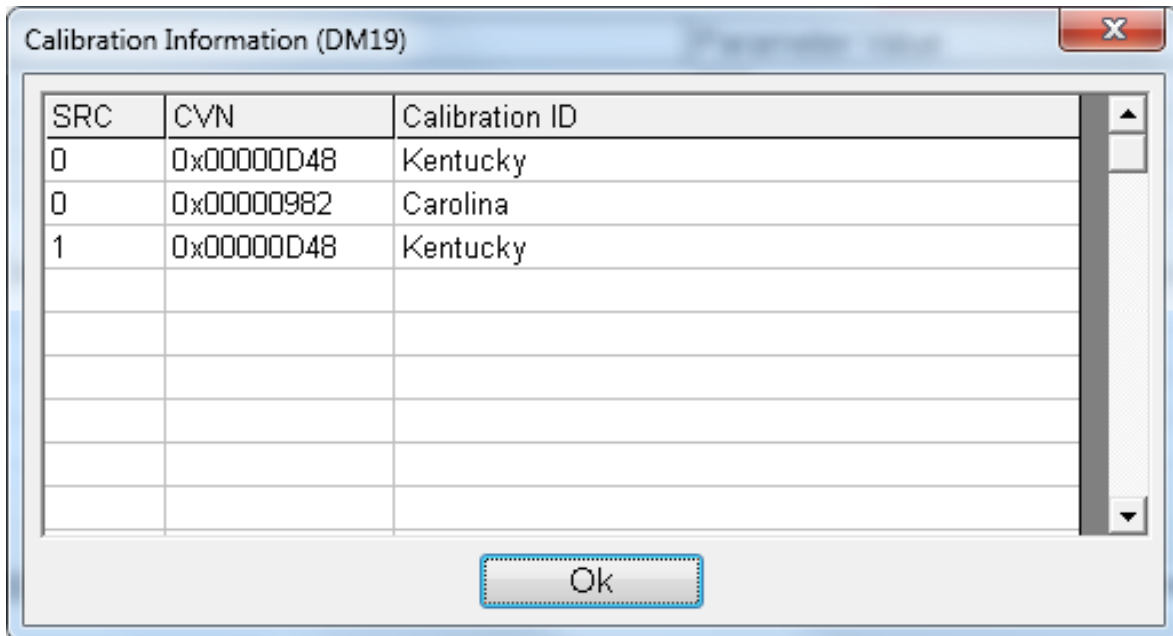
### Buttons on the Emissions Screen



### Calibration Information

Pressing the Calibration Information button will display data from the DM19 message. The information will be the source address of the device along with the Calibration Verification Number and the Calibration Identifier.

Details of the fields will not be covered in this manual, and can be found in the J1939-73 document.







## Display DM24s

Pressing the Display DM24s button will display the following dialog box.

SPNs Supported (DM24 Responses) ×

SRC	SPN	Supp in STR	Supp in DS	Supp in EFF	SPN DataLe
0	92	Yes	No	No	1
0	190	Yes	No	No	2
0	84	Yes	No	No	2
0	105	Yes	No	No	1
0	3301	Yes	No	No	2
0	96	Yes	No	No	1
0	168	Yes	No	No	2
0	1436	Yes	No	No	2
0	513	Yes	No	No	1
0	544	Yes	No	No	2
0	539	Yes	No	No	1
0	540	Yes	No	No	1
0	541	Yes	No	No	1
0	542	Yes	No	No	1
0	543	Yes	No	No	1

OK

DM24 is an emissions related parameter set that is used to identify SPNs supported by the product for DM25, test results, expanded freeze frame and data stream messages. More information can be found on this in the J1939-73 document. The screen labels are as follows.

Supp in STR - SPN Supported in Scaled Test Results

Supp in DS - SPN Supported in Data Stream

Supp in EFF - SPN Supported in Expanded Freeze Frame



## DEF/SCR

This screen displays J1939 Diesel exhaust fluid and selective catalytic reduction data.

Exhaust gas recirculation (EGR) systems progressed to the diesel particulate filter (DPF), and then selective catalytic reduction (SCR).

SCR is the technology of choice for the majority of truck and engine manufacturers to meet 2010 emissions standards for heavy-duty trucks.

Diesel Exhaust Fluid (DEF) and Selective Catalytic Reduction (SCR) Data

Parameter (J1939 PGN/J1939 SPN)	J1939	Metric	J1939	English	Description
AT1T1I - DEF Tank Level (65110/1761)	-1.0000	%	-1.0000	%	
AT1T1I - DEF Tank Temp (65110/3031)	-1.0000	degrees_C	30.2000	degrees_F	
AT1T1I - DEF Tank Level 2 (65110/3517)	-1.0000	mm	-0.0394	inches	
AT1T1I - DEF Tank Prelim FMI (65110/3532)	31	FMI	31		FMI Not Available Or Condition Exists
AT1T1I - SCR Operator Inducement Active (65110/5245)	0	binary	0	binary Off	- Adequate DEF level.
AT1T1I - DEF Tank Temp Prelim FMI (65110/4365)	31	FMI	31		FMI Not Available Or Condition Exists
AT1T1I - SCR Operator Inducement Severity (65110/5246)	1	binary	1	binary	Inducement Level 1   EPA defined SCR Indi
AT1T1I - DEF Tank Heater (65110/3363)	-1.0000	Percent	-1.0000	Percent	
AT1T1I - DEF Tank Heater 1 Prelim FMI (65110/4366)	31	FMI	31		FMI Not Available Or Condition Exists
A1DEFISI - DEF Pump Motor Speed (64828/4374)		RPM		RPM	
A1DEFISI - DEF Pump Drive Percentage (64828/4375)		%		%	
A1DEFISI - DEF Return Valve (64828/4376)		%		%	
A1DEFISI - DEF Tank Fill Valve Command (64828/5434)		%		%	
A1DEFISI - DEF Pump State (64828/5435)		binary		binary	
A1DEFISI - DEF Tank Drain Valve Command (64828/5436)		%		%	
A2DEFISI - DEF Pump Motor Speed (64819/4440)		RPM		RPM	
A2DEFISI - DEF Pump Drive Percentage (64819/4441)		%		%	
A2DEFISI - DEF Return Valve (64819/4442)		%		%	
A2DEFISI - DEF Tank Fill Valve Command (64819/5347)		%		%	
A2DEFISI - DEF Pump State (64819/5348)		binary		binary	
A2DEFISI - DEF Tank Drain Valve Command (64819/5349)		%		%	
A1DEFI - DEF Temperature 2 (64923/3515)	-1.0000	degrees_C	30.2000	degrees_F	
A1DEFI - DEF Concentration (64923/3516)	-1.0000	%	-1.0000	%	
A1DEFI - DEF Conductivity (64923/3518)	-1.0000	uSiemens/mm	-1.0000	uSiemens/mm	
A1DEFI - DEF Temperature 2 Prelim FMI (64923/3519)	31	FMI	31		FMI Not Available Or Condition Exists
A1DEFI - DEF Properties Prelim FMI (64923/3520)	31	FMI	31		FMI Not Available Or Condition Exists
A1DEFI - DEF Type (64923/3521)	16	binary	16	binary	Urea concentration too high.
A2DEFI - DEF Temperature 2 (64822/4420)		degrees_C		degrees_F	
A2DEFI - DEF Concentration (64822/4421)		%		%	
A2DEFI - DEF Conductivity (64822/4422)		uSiemens/mm		uSiemens/mm	

## Parameters

The Parameters Tree on the Parameters tab that displays thousands of J1939 and J1587 parameters.

DG Diagnostics can decode almost all simple numeric parameters such as temperatures and pressures into both Metric and English values.

DG Diagnostics can decode many binary-type parameters such as Off/On or Engaged/Disengaged parameters into their textual representations.

Parameters that cannot be decoded (complex or multi-part parameters) are still listed along with their data and could be decoded by hand if the need arises using the information found using the Display PGN Info and Display SPN Info buttons.

The J1939 tree is sorted by Source Address, then by PGN number.

The J1587 tree is sorted by Message Identifier (MID/Source Address), and then by PID.

The display buttons on the bottom of this screen allow the user to read important information from the J1939 and J1587 documents about the J1939 Parameter Group Number (PGN), J1587 Parameter Identifier (PID), or J1939 Suspect Parameter Number (SPN).

J1939 PGN/SPN Values	Metric Values/Metric Units	English Values/English Units
[-] J1939		
[-] SRC 0 PGN 40448 - DM29	- DTC Counts	
[-] SRC 0 PGN 40960 - DM34	- NTE Status	
[-] SRC 0 PGN 41216 - DM33	- Emission Increasing Auxiliary Emission Control Device Active Time	
[-] SRC 0 PGN 41472 - DM32	- Regulated Exhaust Emission Level Exceedance	
[-] SRC 0 PGN 49408 - DM21	- Diagnostic Readiness 2	
[-] SRC 0 PGN 49664 - DM20	- Monitor Performance Ratio	
[-] SRC 0 PGN 54016 - DM19	- Calibration Information	
[-] SRC 0 PGN 57344 - CM1	- Cab Message 1	
[-] SRC 0 PGN 59392 - ACKM	- Acknowledgment Message	
[-] SRC 0 PGN 61441 - EBC1	- Electronic Brake Controller 1	
[-] SRC 0 PGN 61443 - EEC2	- Electronic Engine Controller 2	
[-] SRC 0 PGN 61444 - EEC1	- Electronic Engine Controller 1	
[-] SRC 0 PGN 61450 - EGF1	- Engine Gas Flow Rate	
[-] SRC 0 PGN 61454 - AT1IG1	- Aftertreatment 1 Intake Gas 1	
[-] SRC 0 PGN 61455 - AT1OG1	- Aftertreatment 1 Outlet Gas 1	
[-] SRC 0 PGN 61491 - A1SCRAI2	- Aftertreatment 1 SCR Ammonia Information 2	
[-] SRC 0 PGN 64709 - A1SCREGT2	- Aftertreatment 1 SCR Exhaust Gas Temperature 2	
[-] SRC 0 PGN 64721 - DM53	- Active Service Only DTCs	
[-] SRC 0 PGN 64722 - DM54	- Previously Active Service Only DTCs	
[-] SRC 0 PGN 64732 - CCVS3	- Cruise Control / Vehicle Speed 3	
[-] SRC 0 PGN 64754 - EFTV11	- Engine Fuel/Throttle Valve Information 1	
[-] SRC 0 PGN 64765 - EEC9	- Electronic Engine Controller 9	
[-] SRC 0 PGN 64775 - DLCC1	- Direct Lamp Control Command 1	
[-] SRC 0 PGN 64800 - A1DOC1	- Aftertreatment 1 Diesel Oxidation Catalyst 1	
[-] SRC 0 PGN 64830 - A1SCREGT1	- Aftertreatment 1 SCR Exhaust Gas Temperature 1	
[-] SRC 0 PGN 64832 - A1SCRDSR2	- Aftertreatment 1 SCR Dosing System Requests 2	
[-] SRC 0 PGN 64878 - A1SCRSI1	- Aftertreatment 1 SCR Service Information 1	
[-] SRC 0 PGN 64891 - AT1S1	- Aftertreatment 1 Service 1	
[-] SRC 0 PGN 64892 - DPFC1	- Diesel Particulate Filter Control 1	
[-] SRC 0 PGN 64896 - DM28	- Emission-Related Permanent Diagnostic Trouble Codes	
[-] SRC 0 PGN 64898 - DM27	- All Pending DTCs	

Pause
Display PGN Info
Display SPN Info
Display PID Info

## Parameters Tree Initial View

Initially after connecting, the parameters tree will look like below. There will be a J1939 tree and a J1587 tree. If there are parameters on that databus, a [+] will appear. Lack of that [+] indicates no data has been seen on that databus.

**Note:** Values and units in the tree will be both in Metric and English.

J1939 PGN/SPN Values	Metric Values/Metric Units	English Values/English Units
[-] J1939		
[-] J1587		

## Expanding a Tree

Most Windows users are familiar with tree views, however if you are not, you can click the [+] (plus sign) to expand a tree node, or you can click the [-] (minus sign) to hide that tree node. For example, clicking the [+] on J1939 might reveal a tree like the following that lists parameters on the J1939 data bus:

J1939 PGN/SPN Values	Metric Values/Metric Units	English Values/English Units
[-] J1939		
[-] SRC 0 PGN 40448 - DM29	- DTC Counts	
[-] SRC 0 PGN 40960 - DM34	- NTE Status	
[-] SRC 0 PGN 41216 - DM33	- Emission Increasing Auxiliary Emission Control Device Active Time	
[-] SRC 0 PGN 41472 - DM32	- Regulated Exhaust Emission Level Exceedance	
[-] SRC 0 PGN 49408 - DM21	- Diagnostic Readiness 2	
[-] SRC 0 PGN 49664 - DM20	- Monitor Performance Ratio	
[-] SRC 0 PGN 54016 - DM19	- Calibration Information	
[-] SRC 0 PGN 57344 - CM1	- Cab Message 1	

## Viewing Numeric Parameter Values:

### - J1939 Numeric Data

Double click on a J1939 SRC and PGN (Parameter Group Number) or press the [+] and you will receive all of the SPNs (Suspect Parameter Numbers) for that PGN. For example, the image below shows Idle Operation (PGN 65244), Vehicle Distance (PGN 65248), Engine Hours and Revolutions (PGN 65253), and Vehicle Hours (PGN 65255) and all of their associated parameters (SPNs).

- The top line shows the ECM sending the PGN (referred to as the Source Address or SRC), the PGN number, the PGN acronym, and the PGN name.
- The second line shows the data bytes that were sent for this PGN in hexadecimal form.
- The third through last lines show each sub-parameter of the PGN, most commonly referred to as SPNs and the value of that parameter in English and Metric forms. For example, Engine Total Idle Fuel Used which is SPN 236 (see below) is 40 liters, or 10.567 gallons and SPN 235 which is Total Idle Hours is 3 hours.

**Note:** *If N/A is seen in a column, it means that the controller does not have a value for that SPN. This is very common on the J1939 data bus.*

J1939 PGN/SPN Values		Metric Values/Metric Units		English Values/English Units	
+	SRC 0 PGN 65244 - IO - Idle Operation				
	DATA = [50][00][00][00][3C][00][00][00]				
	- SPN 236 Engine Total Idle Fuel Used	40.000	l	10.567	g
	- SPN 235 Engine Total Idle Hours	3.000	h	3.000	h
+	SRC 0 PGN 65248 - VD - Vehicle Distance				
	DATA = [80][38][01][00][80][38][01][00]				
	- SPN 244 Trip Distance	10000.000	km	6213.710	miles
	- SPN 245 Total Vehicle Distance	10000.000	km	6213.710	miles
+	SPC 0 PGN 65263 - HOURS - Engine Hours, Revolutions				
	DATA = [28][00][00][00][58][02][00][00]				
	- SPN 247 Engine Total Hours of Operation	2.000	h	2.000	h
	- SPN 249 Engine Total Revolutions	600000.000	Revolutions	600000.000	Revolution
+	SRC 0 PGN 65266 - VH - Vehicle Hours				
	DATA = [14][00][00][00][10][27][00][00]				
	- SPN 246 Total Vehicle Hours	1.000	h	1.000	h
	- SPN 248 Total Power Takeoff Hours	500.000	h	500.000	h

## - J1587 Numeric Data

Double click on a J1587 MID and PID (Parameter Identifier) or press the [+] and you will receive the value for that parameter.

- The top line shows the MID sending the PID (referred to as the Message Identifier/Source Address), the PID number and the PID name.
- The second line shows the data bytes that were sent for this PID in hexadecimal form.
- The next line will show the value of that parameter in English and Metric forms. For example, the image below shows an Estimated Percent Fan Speed of 51.2%.

J1939 PGN/SPN Values		Metric Values/Metric Units		English Values/English Units	
+	MID 128 PID 24 - Generator Coolant Temperature				
+	MID 128 PID 25 - Air Conditioner System Status #2				
+	MID 128 PID 26 - Estimated Percent Fan Speed				
	DATA = [80]				
	Estimated Percent Fan Speed	51.200	%	51.200	%
+	MID 128 PID 27 - Percent Exhaust Gas Recirculation Valve Position				
+	MID 128 PID 28 - Percent Accelerator Position #3				
	DATA = [82]				
	Percent Accelerator Position #3	52.000	%	52.000	%

## Diagnostic Messages and Other Non-Numeric Info in the J1939 Tree

Many complex or multi-part J1939 messages like fault codes require special processing and handling. Since DG Diagnostics decodes almost every fault code message (DM) in J1939, these parameters are displayed in various other parts of the program. If you see Faults/Emissions in the value of a parameter (see circle) you can find these decoded on either the Faults tab, the Emissions tab, or available through pressing a button on one of those tabs. See the sections of this manual dealing with faults and emissions.

J1939 PGN/SPN Values	Metric Values/Metric Units	English Values/English Units
J1939		
SRC 0 PGN 40448 - DM29 - DTC Counts		
SRC 0 PGN 40960 - DM34 - NTE Status		
DATA = [03][03][FF][FF][FF][FF][FF]		
SPN 4131 Manufacturer-specific PM NTE Limited Testing Region Status	Faults/Emissions	Faults/Emissions
SPN 4129 NOx NTE Deficiency Area Status	Faults/Emissions	Faults/Emissions
SPN 4128 Manufacturer-specific NOx NTE Limited Testing Region Status	Faults/Emissions	Faults/Emissions
SPN 4127 NOx NTE Control Area Status	Faults/Emissions	Faults/Emissions
SPN 4132 PM NTE Deficiency Area Status	Faults/Emissions	Faults/Emissions
SPN 4130 PM NTE Control Area Status	Faults/Emissions	Faults/Emissions

Other group functions of J1939 from J1939-21, such as Transport Protocol functions are not decoded and will be displayed in the same manner and indicate what J1939 document to reference to decode those messages.

J1939 PGN/SPN Values	Metric Values/Metric Units	English Values/English Units
SRC 0 PGN 59392 - ACKM - Acknowledgment Message		
DATA = [00][FF][FF][FF][FF][00][DE][00]		
SPN 2548 Group Function Value (NACK_Busy)	See J1939-21	See J1939-21
SPN 2544 Group Function Value (NACK)	See J1939-21	See J1939-21
SPN 2542 Group Function Value (ACK)	See J1939-21	See J1939-21
SPN 2543 Parameter Group Number (ACK)	See J1939-21	See J1939-21

These types of parameters are not typical technician or user-level parameters. These are typically for vehicle network engineers, and they will know where to go for more information about the parameter, such as J1939-21, J1939-81. However, since they are on the data link, they will appear in the tree for completeness.

## Binary Parameters in J1939

Binary parameter values are represented by units of bits, or listed as binary types (see picture below) and the values displayed are the binary representations of those parameter. To see what each bit representation means, scroll to the right.

J1939 PGN/SPN Values	Metric Values/Metric Units	English Values/English Units
SRC 0 PGN 61454 - AT1IG1 - Aftertreatment 1 Intake Gas 1		
SRC 0 PGN 61456 - AT1OG1 - Aftertreatment 1 Outlet Gas 1		
DATA = [FF][FF][FF][FF][3F][FF][FF][FF]		
SPN 3226 Aftertreatment 1 Outlet NOx	N/A	ppm
SPN 3227 Aftertreatment 1 Outlet Percent O2	N/A	%
SPN 3228 Aftertreatment 1 Outlet Gas Sensor Power In Range	11	bit
SPN 3229 Aftertreatment 1 Outlet Gas Sensor at Temperature	11	bit
SPN 3230 Aftertreatment 1 Outlet NOx Reading Stable	11	bit
SPN 3231 Aftertreatment 1 Outlet Wide-Range O2 Reading Stable	00	bit
SPN 3232 Aftertreatment 1 Outlet Gas Sensor Heater Preliminary FMI	11111	binary
SPN 3233 Aftertreatment 1 Outlet Gas Sensor Heater Control	11	bit
SPN 3234 Aftertreatment 1 Outlet NOx Sensor Preliminary FMI	11111	binary
SPN 5713 Aftertreatment 1 Outlet NOx Sensor Self-diagnosis Status	111	bit
SPN 3235 Aftertreatment 1 Outlet O2 Sensor Preliminary FMI	11111	binary

Scrolling to the right shows what the binary representations of those parameters mean. This example shows the SPN 3233 - Aftertreatment 1 Outlet Gas Sensor Heater Control has a binary value of 11 and that value translates into the textual representation of Heater Off.



J1939 PGN/SPN Values	Metric Values/Metric Units		English Values/English		
certreatment 1 Intake Gas 1					
certreatment 1 Outlet Gas 1					
F1[FF]					
NOx	N/A	ppm	N/A	ppm	
Percent O2	N/A	%	N/A	%	
Gas Sensor Power In Range	11	bit	11	bit	Not Available
Gas Sensor at Temperature	11	bit	11	bit	Not Available
NOx Reading Stable	11	bit	11	bit	Not Available
Wide-Range %O2 Reading Stable	00	bit	00	bit	Not Stable
Gas Sensor Heater Preliminary FMI	11111	binary	11111	binary	
Gas Sensor Heater Control	11	bit	11	bit	Heater Off
NOx Sensor Preliminary FMI	11111	binary	11111	binary	
NOx Sensor Self-diagnosis Status	111	bit	111	bit	Not Supported
O2 Sensor Preliminary FMI	11111	binary	11111	binary	

## Binary Parameters in J1587

Since J1587 is being replaced by J1939, complex binary parameters in J1587 are not being decoded into meaningful values because of the effort required. A J1587 binary-type of MID/PID will look like the following. It will have the data associated with the PID in the DATA line (hexadecimal) and it will also include the binary representation of that data in the values field.

```

MID 130 PID 194 - Transmitter System Diagnostic Code and Occurrence Count Table
DATA = [03][15][C9][14]
Transmitter System Diagnostic Code and Occurrence Count Table      [00000011][00010101][11000011][00010100]

```

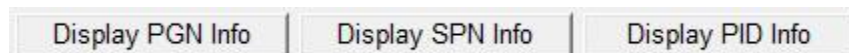
If there is a J1587 binary parameter (PID) that you need to be decoded, please contact DG Technologies and we can look at adding that parameter into a future version of the software.

## Pause/Resume Button

Pressing the Pause button will cause the screen to freeze and not update. Pressing the Resume button will allow the screen to update.

## Parameter Info Buttons - Display PGN Info, Display SPN Info, Display PID Info

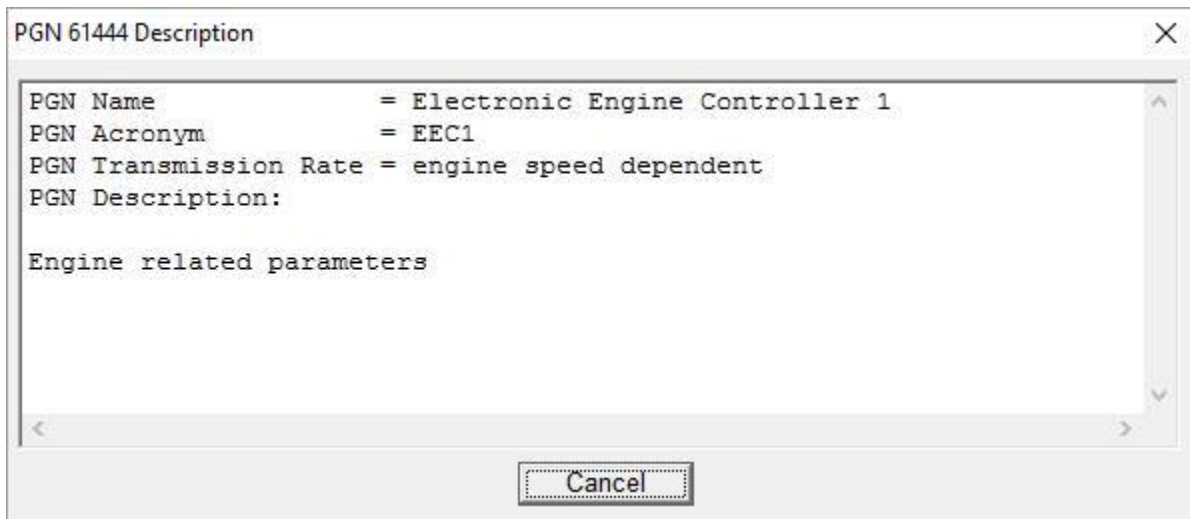
The following three buttons display very useful information about PGNs, SPNs, and PIDs. You must select a specific PGN, SPN, or PID before pressing the button. If you don't, the program will tell you to select one.



## Display PGN Info

Pressing this button will display all information about the selected PGN. Below is an example of PGN 61454.

- PGN Name is the name of the PGN in the J1939 database.
- PGN Acronym is the acronym defined for the PGN in the J1939 database.
- PGN Transmission Rate shows how the PGN is transmitted, or if it must be requested.

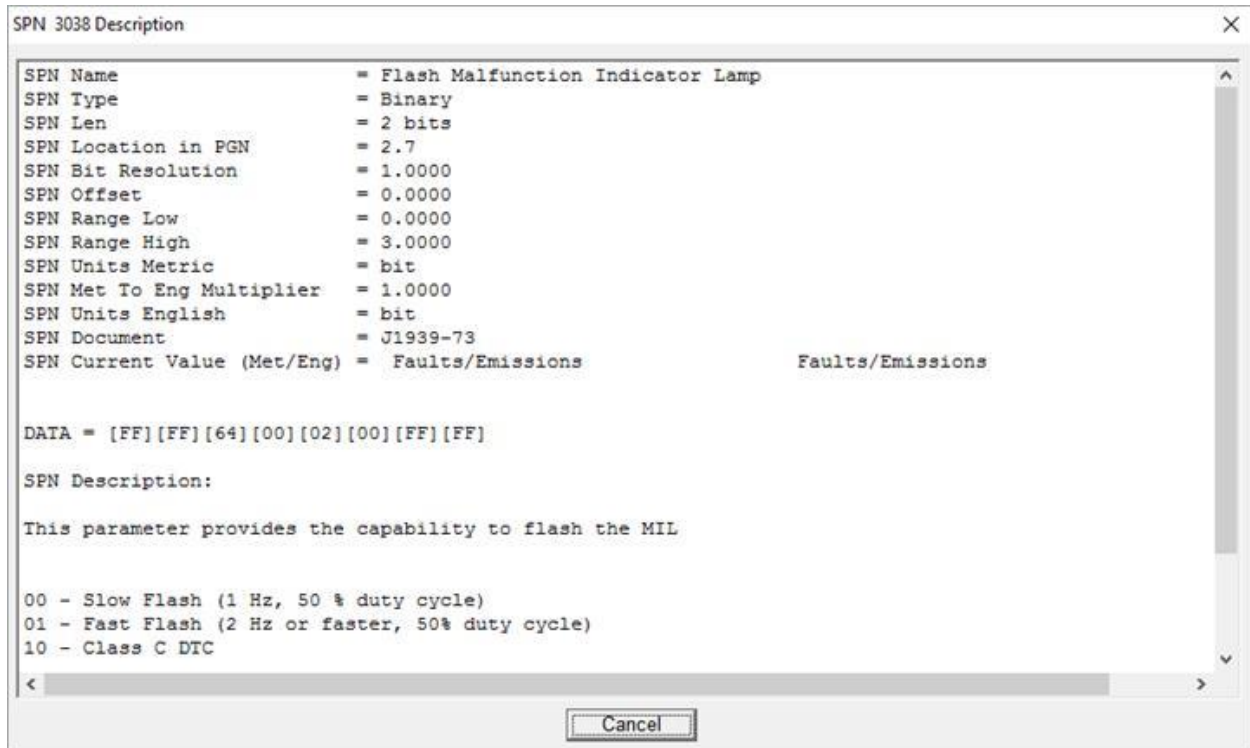


## Display SPN Info

The SPN information includes all data about the parameter and even includes the current value of the parameter and the data bytes from the PGN. The information in the upper paragraph shows detailed information about that parameter and how to decode the parameter. The information in the lower paragraph shows the description of that SPN as it appears in the J1939 documentation.

- SPN Name is the name of the SPN in J1939.
- SPN Type is Numeric, ASCII, or Binary.
- SPN Len is the length in bits or bytes of the SPN.
- SPN Location in PGN tells where in the PGN that this SPN resides.
- SPN Bit Resolution shows the bit resolution/scalar/multiplier for that SPN.
- SPN Offset shows the offset/adder for that SPN.
- SPN Range Low shows the lowest valid value for the SPN.
- SPN Range High shows the highest valid value for the SPN.
- SPN Units Metric shows the metric units for that SPN.

- SPN Met to Eng. Multiplier shows the value to multiply the Metric value by to get the English value.
- SPN Units English shows the English units for that SPN.
- SPN Document shows what SAE J1939 document to refer to in order to find more information.
- SPN Current Value (Met/Eng.) shows the current value for that SPN.
- SPN Description shows the description for that SPN as it appears in the J1939 documentation.



## Display PID Info

The PID information includes all data about the PID from the J1587 documentation, and even includes the current value of the parameter and the data bytes from that PID. The information in the upper paragraph shows detailed information about that parameter and how to decode the parameter. The information in the lower paragraph shows the description of that PID as it appears in the J1587 documentation

- PID Name is the name of the PID as documented in the J1587 document.
- PID Type is Numeric, ASCII, or Binary.
- PID Len is the length in bits or bytes of the PID.
- PID Bit Resolution shows the bit resolution/scalar/multiplier for that PID.
- PID Signed/Unsigned shows if the PID is always positive (unsigned) or can be negative (signed).

A signed PID indicates that the PID is sent using two's complement notation.

- PID Units English shows the English units for that PID.
- PID Eng. to Met Multiplier shows the value to multiply the English value by to get the Metric value.
- PID Units Metric shows the Metric units for that PID.
- PID Current Value (Met/Eng.) shows the current value for that PID.
- PID Description shows the description for that PID as it appears in the J1587 documentation.
- Below PID Description is the PID description from the J1587 document.

The screenshot shows a window titled "PID 84 Description" with a close button in the top right corner. The window contains the following text:

```
PID Name           = Road Speed
PID Type           = Numeric
PID Len            = 1
PID Bit Resolution = 0.5000
PID Signed/Unsigned = Unsigned
PID Units English  = mph
PID Eng To Met Multiplier = 1.6093
PID Units Metric   = kph

PID Current Value (Met/Eng) = 70.811      kph      44.000      mph

DATA = [62]

PID Description:

84 ROAD SPEED

Indicated vehicle velocity.

Parameter Data Length: 1 Character
Data Type:             Unsigned Short Integer
Bit Resolution:        0.805 km/h (0.5 mph)
Maximum Range:         0.0 to 205.2 km/h (0.0 to 127.5 mph)
Transmission Update Period: 0.1 s
Message Priority:       1
```

At the bottom of the window, there is a "Cancel" button and a horizontal scrollbar.



# OEM Applications

**Configure and launch** your OEM applications.

**Note:** Only previously installed OEM application(s) can be executed from DG Diagnostics.

## Configure OEM Applications

This screen is used to set up your OEM applications that can be run by double clicking on a fault or component in one of those grids, or by the menu item Special Features > Configure OEM Applications.

**Note:** When the program first runs, the program writes configuration information to an INI file. This INI contains the default program information for running of OEM applications like CAT, Cummins, WABCO, etc. If the default entries do not work (programs installed in a non-standard location), they can be edited. You can also add or delete OEM applications.

You can also add PDF files that can be launched using the Launch PDF button.

The fields will be explained later in this chapter, after explaining how the Run OEM Diagnostics concept works.

OEM Applications Configured

VMRS	Application Name	Executable	Arguments
INTXX	International ServiceMaxx	C:\WINDOWS\system32\javaws.exe	"C:\Documents and
ICORP	International ServiceMaxx	C:\WINDOWS\system32\javaws.exe	"C:\Documents and
MACK4	Volvo/Mack VCADS	C:\Program Files\Tech Tool\Tech	
MACKX	Volvo/Mack VCADS	C:\Program Files\Tech Tool\Tech	
VLVNA	Volvo/Mack VCADS	C:\Program Files\Tech Tool\Tech	
DTDSC	Detroit Diesel Diagnostic Link	C:\Program Files\DiagnosticLink\Drumroll.exe	
CTRPL	CAT Electronic Technician	C:\Program Files\Caterpillar Electronic Technician\letech.exe	
CMMNS	Cummins INSITE	C:\Intelect\INSITE\Insite.exe	
ALLSN	Allison DOC	C:\Program Files\Allison Transmission\Allison DOC for PC - Service	
BENDX	Bendix ACOM	C:\Bendix\Acom Diagnostics\ECUApp\ecuapp.exe	-m0x1C6
JHNDR	John Deere ServiceAdvisor	C:\Program Files\John Deere\JDMain.exe	
MERWB	Meritor-WABCO Toolbox	C:\Program Files\WABCO\WINNT\Main\MVWMain.exe	
EATON	Eaton ServiceRanger	C:\Program Files\Eaton\ServiceRanger 3\ServiceRanger30.exe	
DANAX	Dana Diagnostics	C:\Program Files\Dana\Dana Diagnostic Tool\Dana Diagnostic Tool.exe	
FRGHT	ServiceLink Offline	C:\Program Files (x86)\Internet Explorer\iexplore.exe	http://localhost/ServiceLink/

VMRS Manufacturer Code:  Alladin Cleaning Systems

Application Name:

Executable Name:

Executable Arguments (If Any):

Type (Executable or PDF):

## **OEM Applications Configured**

This shows the list of OEM applications that are installed. An OEM application requires a VMRS code, an application name, an executable name and program arguments (optional).

**Note:** *Blue lines notify that DG Diagnostics found and confirmed the location of the Installed OEM application.*

### **VMRS Manufacturer Code**

This is the 5-digit TMC VMRS code for a manufacturer. The example shows CMMNS as Cummins.

### **Application Name**

This is the name for the program.

### **Executable Name and Browse Button**

This is the physical executable program for the application. This includes a drive, path, and EXE file name.

### **Executable Arguments**

Some OEM applications (i.e., Bendix ACOM) require specific command line parameters. Enter those here.

### **Type**

If it is an executable OEM program, select EXE. If you are configuring a PDF, enter PDF.

### **Update Entry Button**

After selecting an entry and then modifying parts of the entry, click this button to update it.

### **Delete Entry Button**

After selecting an entry, click this button to delete it.

### **Add Entry Button**

Fill out all of the fields for an entry, and then click this button to add it to the list.

### **Add VMRS Code Button**

This button can be used to enter a new VMRS code that can later be assigned to an EXE or PDF file.

## Launch OEM Applications

You can run an OEM application at any time from the menu Special Features > Launch OEM Applications, or by double clicking on a fault or component in one of those grids. If the fault or component that you selected matches up to a Make (a TMC VMRS code), then DG Diagnostics will disconnect from the data buses and launch the OEM application required by that Make.

Understanding the Make to OEM Application concept is easier explained by showing the US Marine Corps version of DG Diagnostics (which has the faults and components grids close together). The J1708/J1587 Faults grid shows MID 128 (Engine #1) has a fault code. The Component Information grid shows that for MID 128 the VMRS Make is CTRPL (Caterpillar). If the user double clicked either line, the CAT ET application (if it were installed) would launch.

J1708/J1587 Faults and Component Information

AV	MID	MID Description	Code	FMI	Code/FMI Description	Ct
A	128	Engine #1	1	1	Injector Cylinder #1/Data valid but below normal operational range	15
A	128	Engine #1	1	2	Injector Cylinder #1/Data erratic, intermittent, or incorrect	15
A	128	Engine #1	2	1	Injector Cylinder #2/Data valid but below normal operational range	15

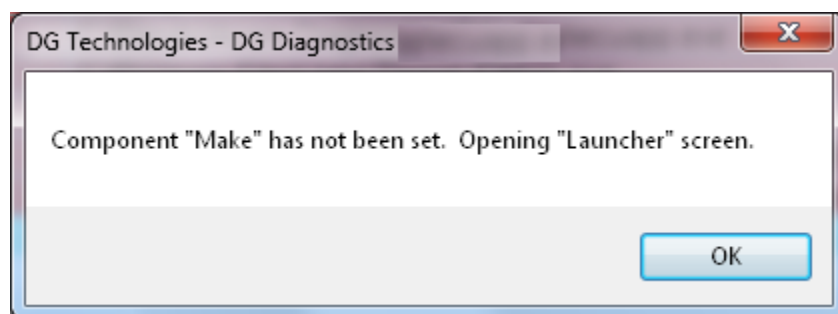
MID	Description	VIN	Make	Model	Serial #	Unit #
128	Engine #1	15UJ0560W0H367424	CTRPL	C-15	ESERNUM	EUNITNUM
130	Transmission		ALLISON	4500	TSERNUM	TUNITNUM
136	Brakes, Power Unit		WABCO	4S/4M	ASERNUM	AUNITNUM

J1587 Traffic

Clear Inactive J1587 Faults

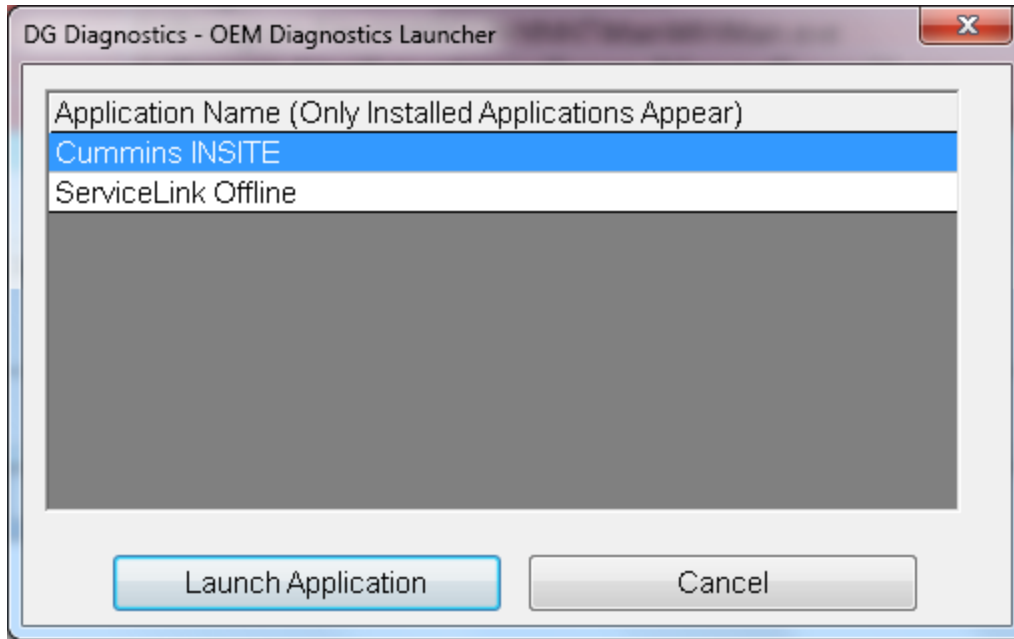
CTRPL CAT Electronic Technician C:\Program Files (x86)\Caterpillar\Electronic Technician\Etech.exe

If a component does not publicly transmit a Make (some don't), then when double clicking an entry in the faults or components grid, or pressing the Run OEM Diagnostics, the following dialog box will appear.



Followed by the OEM Diagnostics Launcher screen:





**Note:** Only applications that are installed on the PC's hard drive will appear (meaning DG Diagnostics has verified that the executable application physically exists on the hard drive for that entry). For example, on this particular PC, Cummins INSITE and CAT ET are installed.

## Truck Data Report

When the user presses the Truck Data Report button, the user will be prompted to save the report as an HTML file that can later be printed, e-mailed, stored, or programmatically parsed. The user will then be prompted for a sub-title for the report along with allowing the user to configure which sections of the report they want to see. This allows the technician to provide a vehicle ID number or other pertinent data to the title section of the report. The configuration will be saved for the next time the user wants to produce a report.

The best choice will be to select all report sections and then go through the report for the sections that make the most sense for your business and uncheck the others.

Truck Data Report Configuration

Enter a subtitle for this Truck Data Report (TDR).

J1587 & J1939 Faults     
 Dynamic Truck Data     
 DM24 List  
 J1939 Freeze Frames     
 J1939 SRC/PGN List     
 DM20 Monitor Perf. Ratio  
 J2012 Fault Codes     
 J1587 MID/PID List     
 J1939 Engine Configuration #1 (EC1)  
 Component Information     
 J1939 Calibration Information     
 Total Trip Data  
 Total Truck Data     
 J1939 Diag Readiness Information     
 J1939 DM8/DM30 Response to DM7  
 Parameters Tree

The HTML is formatted in such a way as to be easily parsed by a fleet's IT department. DG knows of several fleets that are taking this report, parsing out the data, and then storing this information in their asset database. This report looks something like the following:

DG Technologies - DG Diagnostics Truck Report - Tue Jan 18 10:39:50 2011								
Report Title - Fleet Truck #29								
<b>J1587 Component Information</b>								
MID	MID Description	VIN	Make	Model	Serial #	Unit #	Software ID	
128	Engine #1	1FUJC5CVX8HZ67124	CTRPL	C-15	19901008	SEFL-XXXX	C15*3.00*4.10	
130	Transmission	N/A	ALLSN	4500	19940205	SEFL-YYYY	WT1000*4500*35.23*25.897	
136	Brakes, Power Unit	N/A	MERWB	4S/4M	20050201	SEFL-ZZZZ	4S4M*5.67*22.987	
162	Vehicle Navigation Unit	N/A	N/A	N/A	N/A	N/A	N/A	
<b>J1587 Fault Codes</b>								
A/I	MID	MID Description	Code	FMI	Code/FMI Description	Count	STD/PP2	SID/PID
A	128	Engine #1	32	15	Turbocharger #1 Wastegate Drive/Reserved for assignment by the SAE Subcommittee	15	STD	SID
A	130	Transmission	277	3	(P2-021) Reserved (page 2) - TBA/Voltage above normal or shorted high	20	PP2	PID
A	136	Brakes, Power Unit	2	1	Transmitter System Status (see Appendix A/Data valid but below normal operational range)	240	STD	PID
I	128	Engine #1	32	15	Turbocharger #1 Wastegate Drive/Reserved for assignment by the SAE Subcommittee	15	STD	SID
I	130	Transmission	277	3	(P2-021) Reserved (page 2) - TBA/Voltage above normal or shorted high	20	PP2	PID
I	136	Brakes, Power Unit	2	1	Transmitter System Status (see Appendix A/Data valid but below normal operational range)	240	STD	PID
<b>J1939 Component Information</b>								

## Supported Diagnostic Messages

### DMs from J1939/73

**GUI** - DM message visible from one of the screen elements (i.e., grid, button, dialog box).

**TDR** - DM message available from the Truck Data Report.

**Sent** - This DM message is sent from somewhere in the program (i.e., button or automatically).

GUI	TDR	Sent	DM#	PGN#	Description
Y	Y		DM1	65226	Active Diagnostic Trouble Codes (DTCs)
Y	Y		DM2	65227	Previously Active Diagnostic Trouble Codes (DTCs)
		Y	DM3	65228	Diagnostic Data Clear/Reset for Previously Active DTCs
Y	Y		DM4	65229	Freeze Frame Parameters
Y	Y		DM5	65230	Diagnostic Readiness 1
Y	Y		DM6	65231	Emission Related Pending DTCs
		Y	DM7	58112	Command Non-continuously Monitored Test
Y	Y		DM8	65232	Test Results for Non-continuously Monitored Systems
N/A	N/A	N/A	DM9	N/A	Oxygen Sensor Test Results
Y	Y		DM10	65234	Non-continuously Monitored Systems Test Identifiers Support
		Y	DM11	65235	Diagnostic Data Clear/Reset for Active DTCs
Y	Y		DM12	65236	Emissions Related Active DTCs
NO	NO	NO	DM13	57088	Stop Start Broadcast
NO	NO	NO	DM14	55552	Memory Access Request
NO	NO	NO	DM15	55296	Memory Access Response
NO	NO	NO	DM16	55040	Binary Data Transfer
NO	NO	NO	DM17	54784	Boot Load Data
NO	NO	NO	DM18	54272	Data Security
Y	Y		DM19	54016	Calibration Information
Y	Y		DM20	49664	Monitor Performance Ratio
Y	Y		DM21	49408	Diagnostic Readiness 2
		Y	DM22	49920	Individual Clear/Reset of Active and Previously Active DTC
Y	Y		DM23	64949	Emission Related Previously Active DTCs
Y	Y		DM24	64950	SPN Support
Y	Y		DM25	64951	Expanded Freeze Frame
Y	Y		DM26	64952	Diagnostic Readiness 3
Y	Y		DM27	64898	All Pending DTCs

Y	Y		DM28	64896	Permanent DTCs
Y	Y		DM29	40448	Regulated DTC Counts (Pending, Permanent, MIL-On, PMIL-On)
Y	Y		DM30	41984	Scaled Test Results
Y	Y		DM31	41728	DTC to Lamp Association
Y	Y		DM32	41472	Regulated Exhaust Emission Level Exceedance
Y	Y		DM33	41216	Emission Increasing Auxiliary Emission Control Device Active Time
Y	Y		DM34	40960	NTE Status
Y	Y		DM35	40704	Immediate Fault Status
Y	Y		DM36	64868	Harmonized Roadworthiness - Vehicle (HRWV)
Y	Y		DM37	64867	Harmonized Roadworthiness $i_{\frac{1}{2}}$ System (HRWS)
Y	Y		DM38	64866	Harmonized Global Regulation Description (HGRD)
Y	Y		DM39	64865	Harmonized Cumulative Continuous Malfunction Indicator $i_{\frac{1}{2}}$ System (HCMI)
Y	Y		DM40	64864	Harmonized B1 Failure Counts (HB1C)
Y	Y		DM41	64863	DTCs- A, Pending
Y	Y		DM42	64862	DTCs- A Confirmed and Active
Y	Y		DM43	64861	DTCs- A, Previously Active
Y	Y		DM44	64860	DTCs- B1, Pending
Y	Y		DM45	64859	DTCs- B1, Confirmed and Active
Y	Y		DM46	64858	DTCs- B1, Previously Active
Y	Y		DM47	64857	DTCs- B2, Pending
Y	Y		DM48	64856	DTCs- B2, Confirmed and Active
Y	Y		DM49	64855	DTCs- B2, Previously Active
Y	Y		DM50	64854	DTCs- C, Pending
Y	Y		DM51	64853	DTCs- C, Confirmed and Active
Y	Y		DM52	64852	DTCs- C, Previously Active
Y	Y		DM53	64721	Active Service Only DTCs
Y	Y		DM54	64722	Previously Active Service Only DTCs
		Y	DM55	64723	Clear All Service Only DTCs
Y	Y		DM56	64711	Model Year and Certification Engine Family (DM56)

## Launch PDF

Configure and run Adobe reader on any PDF file. OEMs typically include PDF files with their diagnostic programs, and DGD can be configured to launch Adobe on those PDF files without having to enter into the OEM diagnostic application first. This feature was added by request of the US Army.

# Register

DG Technologies has placed a lot of effort into providing you with a high-quality, diagnostics utility that we provide free-of-charge. We appreciate and value your business and we hope that you will take a minute to register the DG Diagnostics product with us.

If you take the time to register, we will e-mail you with updates to the DPA drivers or to DG Diagnostics, as well as subscribe you to our DG Networker e-newsletter. If you select the "I would like to beta test future versions of DG Diagnostics" radio button, we will also e-mail you with beta versions of DG Diagnostics so that you can provide us with feedback and potential bug reports. Our beta testers have provided great feedback that culminated in the many changes and enhancements that were added to DG Diagnostics over the years.

**Note:** *Your personal information will not be shared in any way with any third party outside of DG Technologies. We value your privacy, as we value our own. We will not spam you with unsolicited e-mail other than the occasional periodic DPA/DG Diagnostics updates or the DG Networker newsletter. You can expect to receive one or two e-mails per quarter.*

We would like to know who our users are, and we would like to have your comments on what we can do to make the DG Diagnostics and DPA products better for you. Please feel free to e-mail us with suggestions to [techsupp@dgtech.com](mailto:techsupp@dgtech.com) and we will look at your request for a potential future version of the product.

If you like DG Diagnostics, take a minute to register the program.

We will email you with information regarding new versions of DPA drivers, DG Diagnostics, and you will receive the DG Networker e-newsletter.

DG does not sell or give your information to any third parties. You will not receive any unsolicited emails.

Registration fields

First name:  Last name:

Email address:

Company:

I would like to beta test future versions of DG Diagnostics.

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## Acronyms

Abbreviation	Description
API	Application Programming Interface
AWL	Amber Warning Lamp
bps	bits per second
CAN	Controller Area Network
CM	Fault Code SPN Conversion Method
COM	Communication port
CSV	Comma Separated Values
DG®	Registered trademark of Dearborn Group, Inc.
DGD	DG Diagnostics
DM1	Active DTCs
DM12	Emissions Related Active DTCs
DM2	Previously Active DTCs
DM23	Emission Related Previously Active DTCs
DM27	All Pending DTCs
DM28	Permanent DTCs
DM35	Immediate Fault Status
DM41	DTCs- A, Pending
DM42	DTCs- A Confirmed and Active
DM43	DTCs- A, Previously Active
DM44	DTCs- B1, Pending
DM45	DTCs- B1, Confirmed and Active
DM46	DTCs- B1, Previously Active
DM47	DTCs- B2, Pending
DM48	DTCs- B2, Confirmed and Active
DM49	DTCs- B2, Previously Active
DM50	DTCs- C, Pending
DM51	DTCs- C, Confirmed and Active
DM52	DTCs- C, Previously Active
DM53	Active Service Only DTCs
DM54	Previously Active Service Only DTCs
DM6	Emission Related Pending DTCs
DPA	Dearborn Protocol Adapter
DPA 5	Dearborn Protocol Adapter 5 is DG Technologies tool of choice for diagnosing and reprogramming heavy duty trucks, buses, construction, agriculture, military, and industrial stationary equipment. The DPA 5 also has selective support for automotive vehicles.

Abbreviation	Description
EC1	J1939 Engine Configuration
ECM	Engine Controller
ECU	Electronic Control Unit
EFF	J1939 Expanded Freeze Frames
fAWL	Flashing Amber Warning Lamp
FMI	Failure Mode Identifier
fMIL	Flashing Malfunction Indicator Lamp
fPL	Flashing Protect Lamp
fRSL	Flashing Red Stop Lamp
GGA	GPS DOP and active satellites
GPS	Global Positioning System
GSV	GPS Satellites in View
HTML	Hypertext Transfer Protocol is a set of instructions for the software that controls the movement of files on the Internet
ID	Identifier
MD/HD	Medium-Duty and Heavy-Duty
MID	J1587 Message Identifier
MIL	Malfunction Indicator Lamp
NMEA	Marine Electronics Association
OBDII	On-Board Diagnostics Generation Two
OEM	Original Equipment Manufacturer
PC	Personal Computer
PDF	Portable Document Format
PID	Parameter Identifier
PL	Protect Lamp
RMC	Recommended minimum specific GPS/Transit data
RP1210	Open interface between Windows-based applications and in-vehicle communication networks, developed as a "Recommended Engineering and Maintenance Practice" by the Technology & Maintenance Council (TMC) of the American Trucking Association (ATA).
RSL	Red Stop Lamp
SAE	Society of Automotive Engineers
SAE J1708/J1587	The J1587 protocol defines the format of J1708 messages sent between microprocessors devices in heavy duty vehicles. It also supports communication with external devices connected to the bus. J1587 is an application layer and is used together with J1708, which is the physical layer.
SAE J1939	J1939 is a set of standards used in heavy-duty vehicles such as trucks and buses, mobile hydraulics, etc. In many ways, J1939 is similar to the older J1708 and J1587 standards, but J1939 is built on CAN.
SAE J1939 RP	Serial Control and Communications Vehicle Network

Abbreviation	Description
SAE J1939-01	Truck and Bus Specific
SAE J1939-02	Construction and Agriculture Specific
SAE J1939-03	On Board Diagnostics Implementation Guide
SAE J1939-05	OBD for Marine Spark-Ignition Sterndrive and Inboard Engines
SAE J1939-11	Physical Layer - Shielded Twisted Pair with Drain
SAE J1939-12	Physical Layer - Twisted Quad, Active Terminators
SAE J1939-13	Diagnostic Connector
SAE J1939-15	Physical Layer - Twisted Pair
SAE J1939-21	Data Link Layer
SAE J1939-31	Network Layer
SAE J1939-71	Applications Layer
SAE J1939-73	Application Layer, Diagnostics
SAE J1939-74	Application - Configurable Messaging
SAE J1939-75	Application Layer - Generator Sets and Industrial
SAE J2012	Defines the standardized DTCs that On-Board Diagnostic (OBD) systems in vehicles are required to report when malfunctions are detected.
SAE J2534	Interface standard designed by SAE (Society of Automotive Engineers) and mandated by the US EPA (Environmental Protection Agency) for vehicle ECU reprogramming
SID	Subsystem Identifier
SPN	Suspect Parameter Number
USB	
VDA	Vehicle Diagnostic Adapter
VIN	Vehicle Identification Number
VSI-2534	VSI-2534 is DG Technologies tool reprogramming and diagnostics tool used on all older automotive vehicles along with some newer makes and models. Visit <a href="https://www.dgtech.com/vsi-2534/">https://www.dgtech.com/vsi-2534/</a>



## **Warranty**

### **DG Diagnostics - As Is, No Warranty**

This program is provided AS IS and is free-of-charge for owners of DG RP1210-compliant products. It was intended to be a value-added feature to enhance the inherent value of DG's RP1210 product line.

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DG Technologies makes no warranty as to the performance of this product. DG Technologies has placed this program through extensive testing, however as with any software, there could be deficiencies. Therefore, we cannot guarantee that any parameters displayed are accurate.

We hope that you enjoy this tool and find it of value. If you find deficiencies, or have requests for the addition of non-OEM-proprietary functionality, please do not hesitate to contact us.

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This software works only in conjunction with Dearborn Group Technology RP1210 devices. Any attempt to modify the software, or PC environment, so that this program would connect and use a non-DG RP1210 device will be considered a breach of the programs' copyright.

## Technical Support

After reading and following the troubleshooting and validation procedures in this document please check the FAQ page at [www.dgtech.com/faqs/](http://www.dgtech.com/faqs/). If you are still not able to resolve an issue, please feel free to contact DG technical support. For users in the United States, technical support is available from 9 a.m. to 5 p.m. Eastern Time. You may also fax or e-mail your questions to us. For prompt assistance, please include your voice telephone number and the serial number.

### DG Technologies Technical Support



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**Users not residing in the United States should contact your local DG representative or e-mail [Tech Support | DGTech](mailto:Tech Support | DGTech)**