
# DG TECHNOLOGIES DPA HEALTH Secure Predictive Maintenance Software User Manual

Contents



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This document describes the DG Technologies/DPA HEALTH™ tool. DPA HEALTH is a predictive analytic tool

that accesses the current condition of the vehicle's starting circuit, charging circuit, and battery pack.
DPA HEALTH collects the vehicle digital data using the ECU CAN message data, along with analog or digital signals from sensors and actuators. This provides a complete picture of the vehicle's electrical system health for analysis or diagnosis of the user's specific concerns.


## I M P O R T A N T

To ensure your success with this product, it is essential that you read this document carefully before using the hardware and software.
Damage caused by misuse of the hardware and software 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.
No license is granted, by implication or otherwise, for any patents or other rights of DG or of any third party.

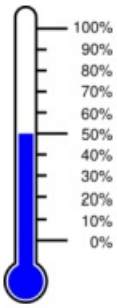
## Introduction

**Electrical System Health Monitoring:** Modern vehicles are becoming more electrified and integrated with multiple ECUs and sensors, which make them smarter in terms of engine decisions, performance, fuel efficiency, security, safety, and stability.
DPA HEALTH provides a portable diagnostic solution for your vehicle's electrical applications. It is a predictive analytic tool that accesses the current condition of primary electrical system:
Battery / Battery pack health Starting System health Charging System health

DPA HEALTH is based on a TMC Position Paper (2018-3 "Automatic Monitoring of Electrical System Health Monitoring). The condition of the electrical system is assessed by combining circuit analysis with statistical analysis. When paired together, these two fundamentally sound sciences quantify the state of health (SOH) for batteries, alternators, starters, and electrical cables. The use of vehicle CAN communication network allows for downloading of data, scheduling of maintenance and integration with other fleet management systems.

## Recommended Usage of DPA Health
## For best and accurate results

Ambient Temperature should be above 50-degree Fahrenheit (50 ◦F). The battery pack should have a voltage of 12.0 volts or higher. On vehicles with capacitor starting systems the batteries can only be tested by isolating (disconnecting) the capacitor start system.



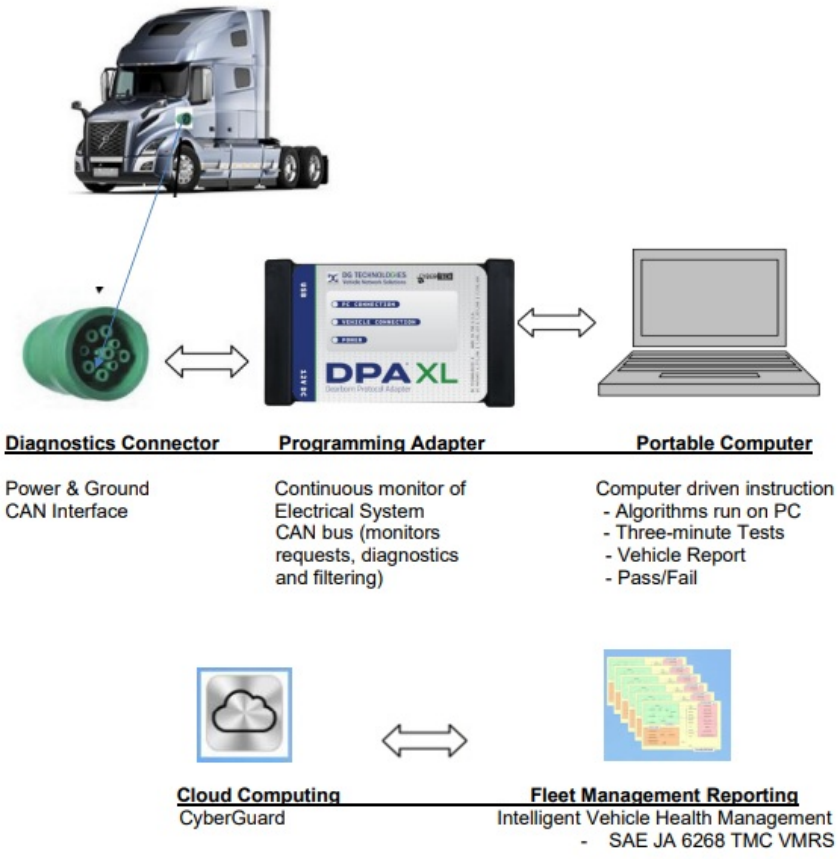

**Temperature: Above 50 Degrees F**


**Voltage: Above 12 volts**

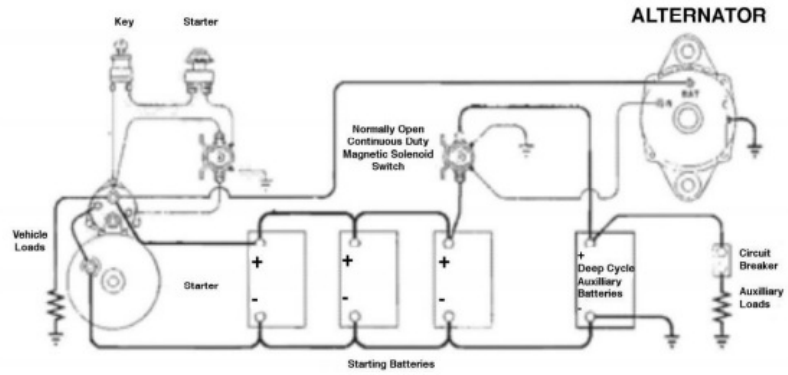
1. Cold weather starting aids such as battery warmers, heaters for block, fuel, oil pan and inlet air grid heaters can adversely affect the test results. Testing at temperatures above 50 ◦F is recommended.
2. Battery packs with the initial voltage below 12.0 volts will return the message “Charge and Retest”. Charge the batteries using the manufactures recommendations and allow resting time before The rest time is usually 4 hours before conducting a retest.
3. On vehicles with capacitor start systems (ultra-capacitors or super capacitors) the capacitor unit must be isolated (disconnected) before starting the test.

## DPA HEALTH

**Illustration DPA HEALTH Configuration:**




## Primary Electrical System (PES)




Typical configuration – Medium and Heavy-Duty

### DPA HEALTH Quick Reference Conditions Chart

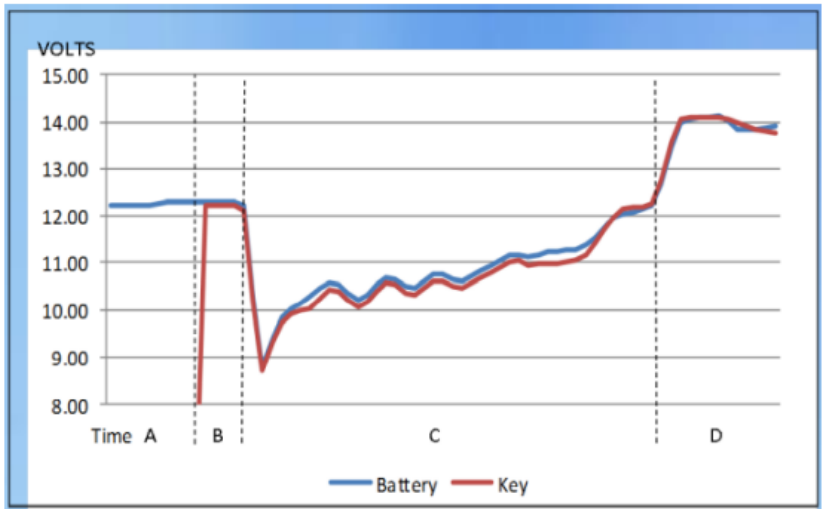
| | |
|---|---|
| Battery Conditions | State of Health (SOH), State of Charge (SOC) |
| Abnormal Current | Internal battery leakage, parasitic |
| Starter Prognosis | Power and Energy Profile, Trend Analysis, |
| Cables | Abnormal high voltage drop of Battery / Alternator / Starter due to corrosion or loose connections |
| Alternator | Over/Under charging and abnormal waveform |

### How DPA HEALTH Works

The application is guides the technician through a series of steps that exercises the electrical system in four phases of operation

A – Key OFF B – Key ON
C – Start Engine Cycle D – Charging Cycle

Date is recorded in each of the four phases. It takes approximately 3 minutes.



The DPA Health analysis is done in the cloud and reported back to the technician on the PC within seconds of completing the test sequence.
**Features** – This application is designed to work with a laptop and DG Technologies DPA XL. The following status data is displayed after hooking up to the vehicle from the DG Technologies DPA XL and opening the DPA Health Application;

## DPA HEALTH Report

The state of health for each system test is color coded, **Good, Marginal, Suspect.**

- **Good:** SOH is No maintenance is required.
- **Marginal**: There was a problem running the test and/or missing data. Marginal is accompanied with an instruction such as Charge batteries/retest, Retest or
- **Suspect** Conditions warrant that maintenance should be

**Vehicle Data:**

Date of Test Vehicle VIN Vehicle ID Odometer Reading Engine Hours Vehicle Faults

- Active
- Inactive Temperatures
- Ambient
- Initial Coolant

**Battery Pack: Good, Marginal, Suspect**

Battery Voltage

- Initial state of charge State of Health
- Remaining Life expressed as a percentage (%) Rated Cold Cranking Amps (CCA)

Estimated Cold Cranking Amps (CCA)

**Starting Circuit: Good, Marginal, Suspect**

Minimum Crank Voltage Average Crank Voltage Cranking Time
Suspect Condition if present
Cranking Voltage

- Minimum
- Average Cranking Time

**Charging Circuit: Good, Marginal, Suspect**

Charging Voltage at battery Suspect Condition if present

**Setup and Operation** – Several features contribute to this area:

Operation utilizing a standard Windows based laptop (not available for Apple/MAC PC's) Easy to use

- Device configuration is performed automatically Data analysis and file management
- Securable custom functionality available

Automated secure cloud data storage allows access via internet Suitable for fleet data collection and management
**Software** – Several items contribute to this area:

## DPA HEALTH

DPA XL Software installed Truck-connect dashboard

**Benefits –**

Reduced PM time (3-4 minutes verses 45 minutes for RP129)
Provide an off-board diagnostic and prognostic of the primary electrical system (battery, starter, alternator and cable) through the vehicle diagnostic connector
Report generation
Data files automatically transferred to Cloud Dashboard Data Storage

- Data storage large enough for large vehicle fleets

Automated DG Technologies Server Data Storage allows access via internet State of health analysis of:

- Charging Circuit
- Battery Pack

o Starting Circuit

**Use Case** – examples:

Vehicle Data Storage Fleet data collection
Fleet application, with analytics Complete Electrical System testing

**Technical Aspects– examples:**

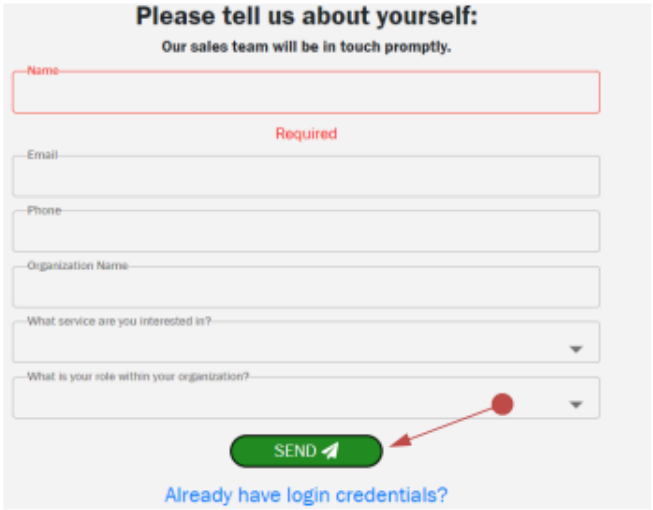
ECU communications
Services and full electrical diagnostic data Emission sensor signals
Auto-baud detection on all channels at power-up

## Hardware Requirements

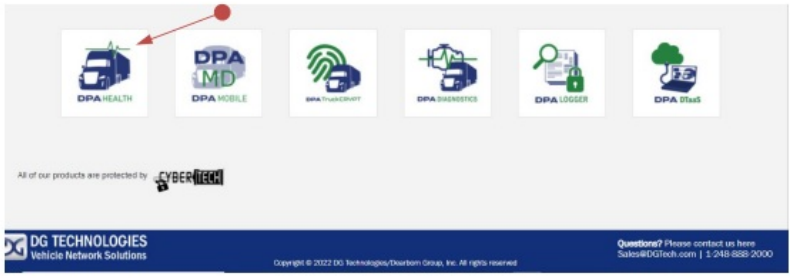
Computer with a wireless connection Windows 10/11 8 GB RAM32 GB or more free disk space Not available on Apple or Mac Pc

**For New DPA HEALTH Connect Subscribers:**


**Step 1** – From the Truck Connect portal, choose [GET STARTED].




**Step 2** – Enter all required information so that our sales team can contact you, and select [SEND].

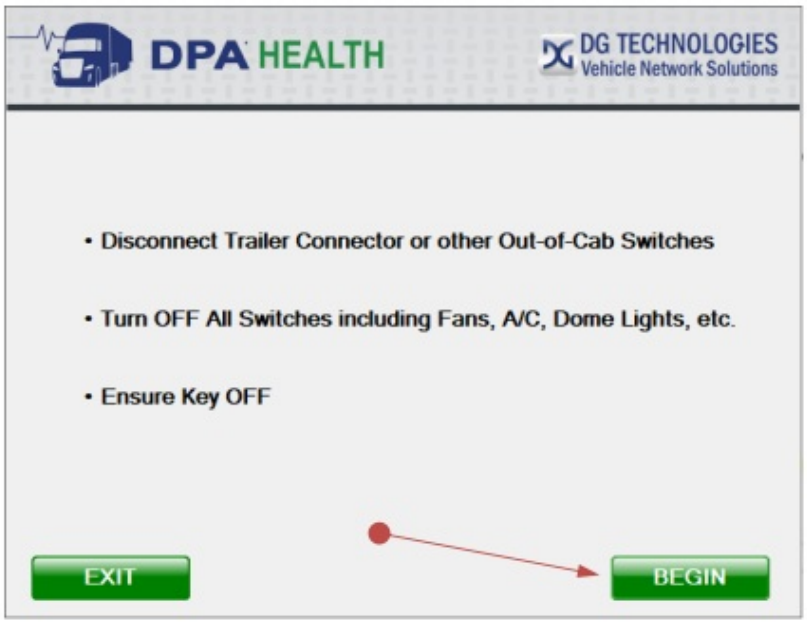

**Step 3** – From the DG Technologies Truck Connect Portal, select **DPA Health**.
**Step 4** – A series of screens will appear to download the DPA HEALTH application. After successfully loading the application the following Desktop Icon will appear


:

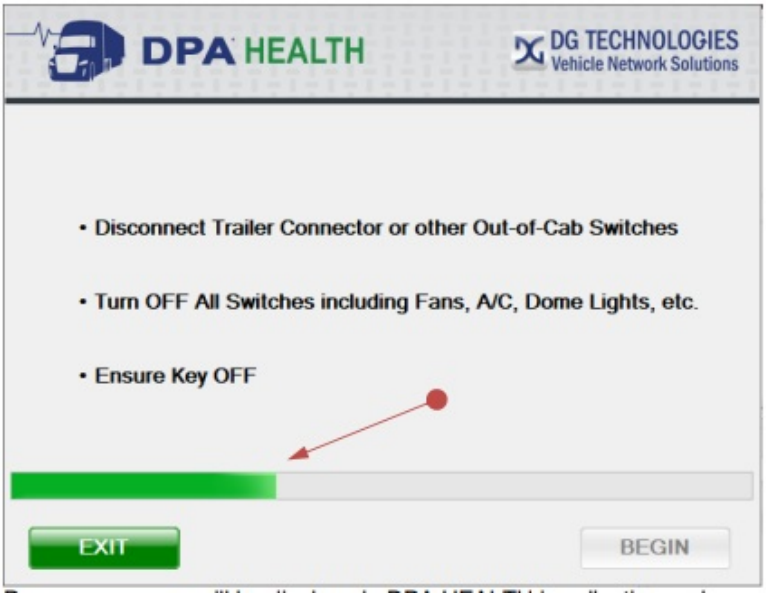
### Main Login and Subscription Verification


After you receive your credentials from DG Technologies, enter your username and network password. Select [LOGIN]. to enter the DPA HEALTH application. The active subscription and cloud connection verification progress bar will be displayed after selecting [LOGIN]. Select [EXIT] to leave the application

**Initial Setup Screen**



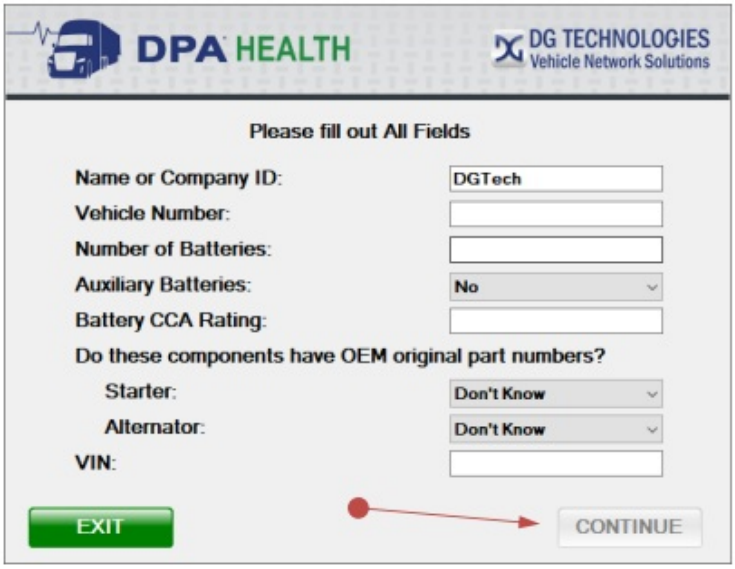

After all connections/switches have been disconnected or turned off, select [BEGIN] to start the DPA HEALTH system. Select [EXIT] to leave the system.




Program progress will be displayed. DPA HEALTH is collecting and processing vehicle data during the Key Off sequence. Follow on screen instructions.

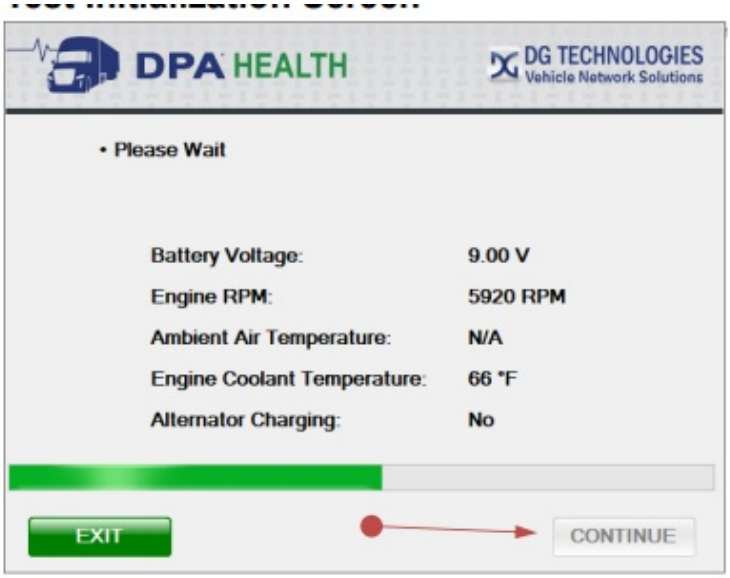

Follow all on screen instructions in the test sequence and select [OK].

### Vehicle Information Entry



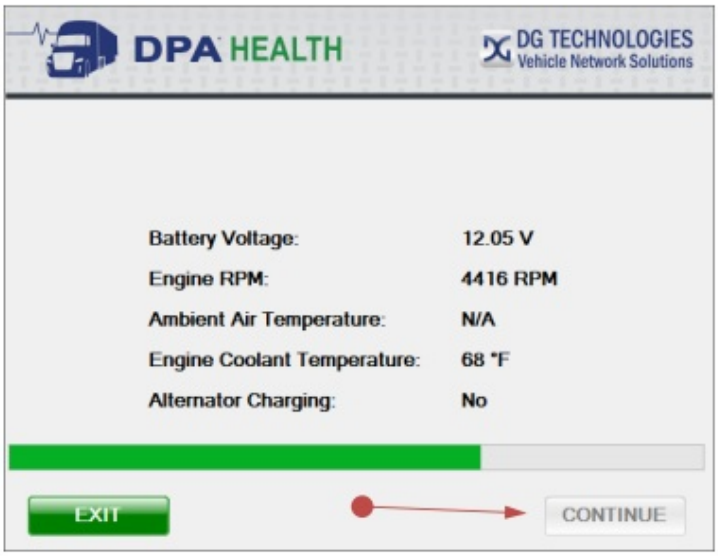

Next the ‘Vehicle Information Entry” screen will be displayed.
When required, please enter correct data for all items. When complete, select [CONTINUE].

### Test Initialization Screen



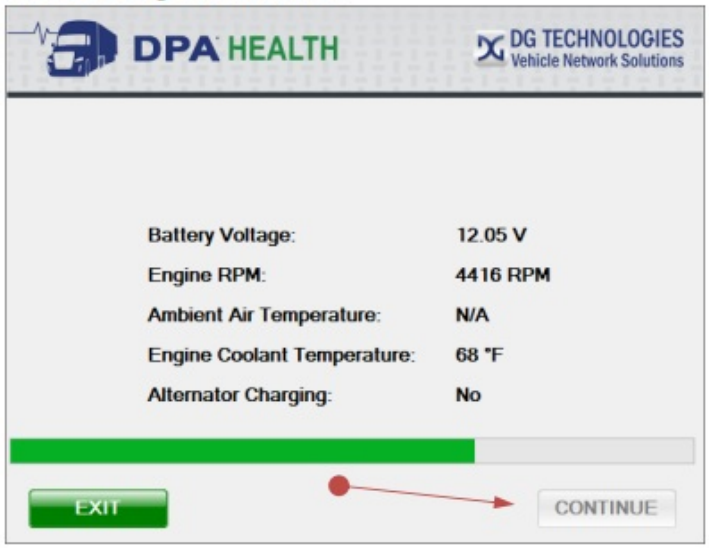

Select [CONTINUE] to advance the test.

### Start Engine




For the next part of the sequence, make sure all accessories are off and start the engine as instructed. Select [CONTINUE].

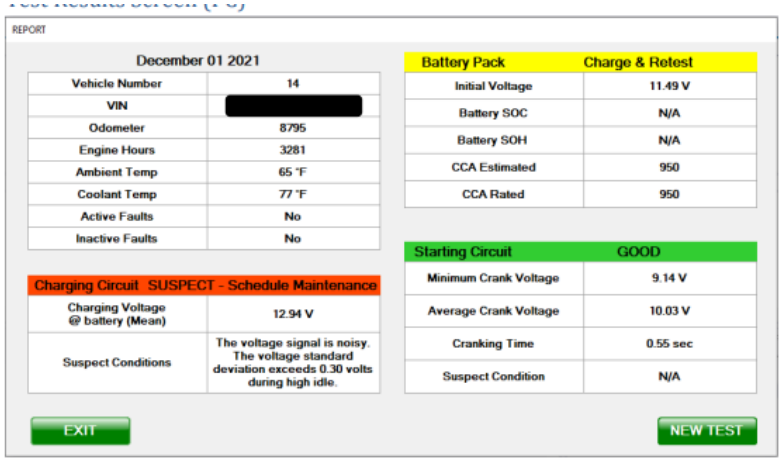
### Accessory Activation



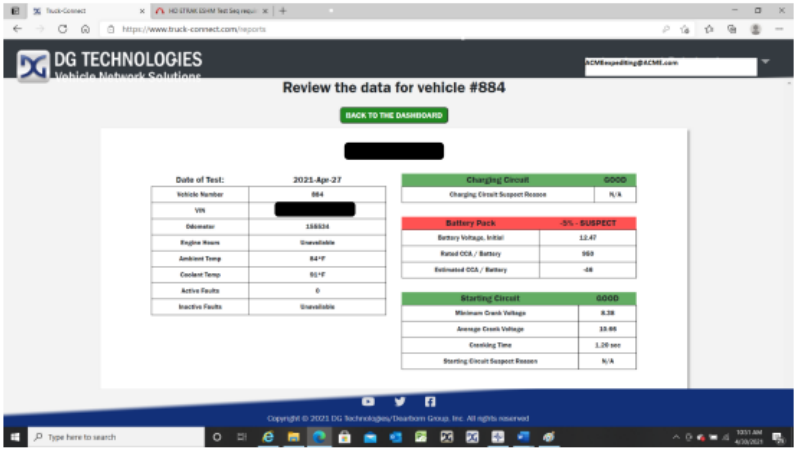

For this part of the test sequence, turn on all switches and accessories. Headlights, Blower Motor, Radio, Flashers, etc. when test is complete, select [CONTINUE].


- When test is complete, user will be prompted that files have been uploaded and allowed to continue to the [BEGIN] screen.

### Test Results Screen (PC)’

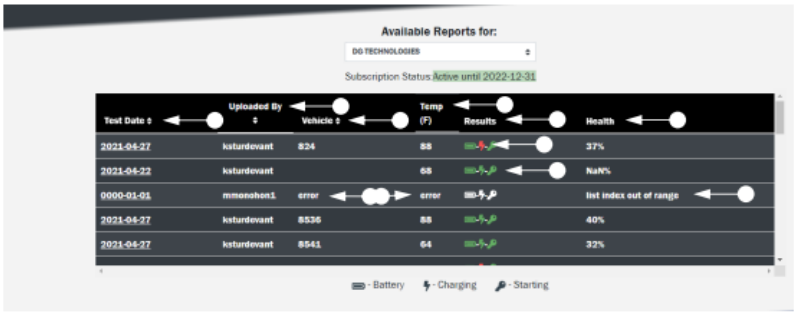


### DPA Health Dashboard




This screen displays the DPA Health Dashboard

## Available Test Reports




- If a number of Test Results are available, they may be selected from this
  - Test Date – displays the date when the data was taken
  - Updated By – displays the name of the person who updated the data
  - Vehicle – displays the vehicle #
  - Temp – displays the temperature at which the data was taken
  - Results – displays specific battery, charging, and starting information
  - Health – displays specific data related to vehicle condition
- The cursor may be moved over any specific item to display data stored for that selection
  - All items in “red” display “out of range etc.” data
    - In the example shown, the engine speed was in the wrong range
  - Items in “green” are in the correct range
- If “Error” appears on the Test Reports screen:
  - There is an error or errors in the data reported
    - Perform the test again with the proper test parameters

## Technical Support and Return Merchandise Authorization

After reading and following the troubleshooting and validation procedures in this document please check the FAQ page at www.dgtech.com/faqs or www.truckconnect.com. 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.

DG Technologies Technical Support
Phone: (248) 888-2000
Fax: (248) 888-9977
E-mail: techsupp@dgtech.com
Web site:www.dgtech.com/tech-support

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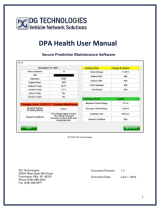
## Documents / Resources

| | |
|---|---|
|  | DG TECHNOLOGIES DPA HEALTH Secure Predictive Maintenance Software [pdf] User Manual<br>DPA HEALTH Secure Predictive Maintenance Software, DPA HEALTH, Secure Predictive Maintenance Software, Maintenance Software |

## References

- Controller Area Network | Article about Controller Area Network by The Free Dictionary
- Home | DG Technologies
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- FAQ's | DG Technologies
- Tech Support | DG Technologies
- truckconnect.com