GDS - Diagnosis

Ver. 04. 06. 2010

Basic inspection

Basic Inspection offers standard checklists of each system for the users' vehicles.

Last selecting items such as "Engine", "T/M and Driving", "Brake and Steering" and "Others System" will appear on the Basic Inspection Menu at the left sub menu.

Inspection results will be shown on the right side of the page when an item in the end node is selected.

Select one option from the checklist section among Good (G), Repair(R) and Exchange (E) after verifying "Check Point", "Current Status", and "Normal Value".

Click "Save" button to save. The content saved will be shown in the "VIN Info" when the same VIN is selected in the future.

Engine System

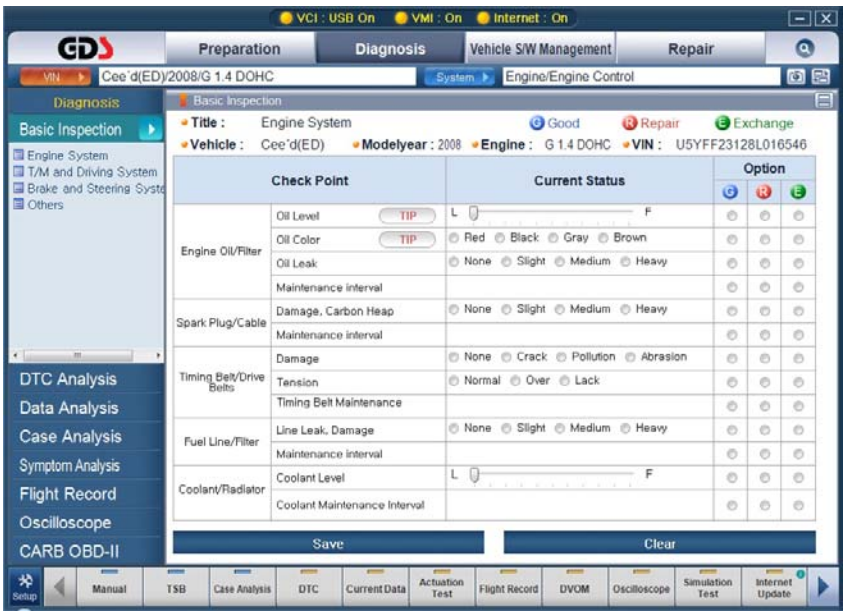


Figure 1. Basic Inspection - Engine System

T/M and Driving System

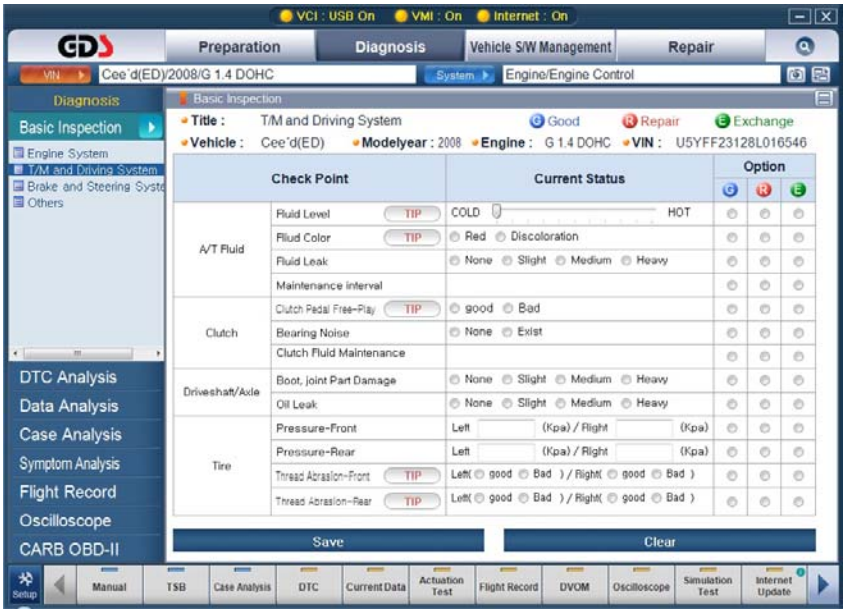


Figure 2. Basic Inspection – T/M and Driving System

Brake and Steering System

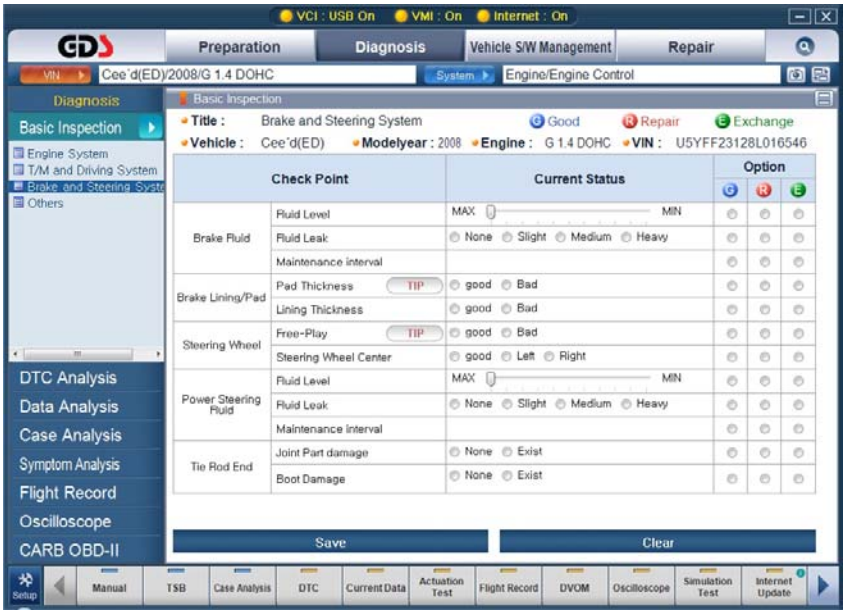


Figure 3. Basic Inspection – Brake and Steering System

Others

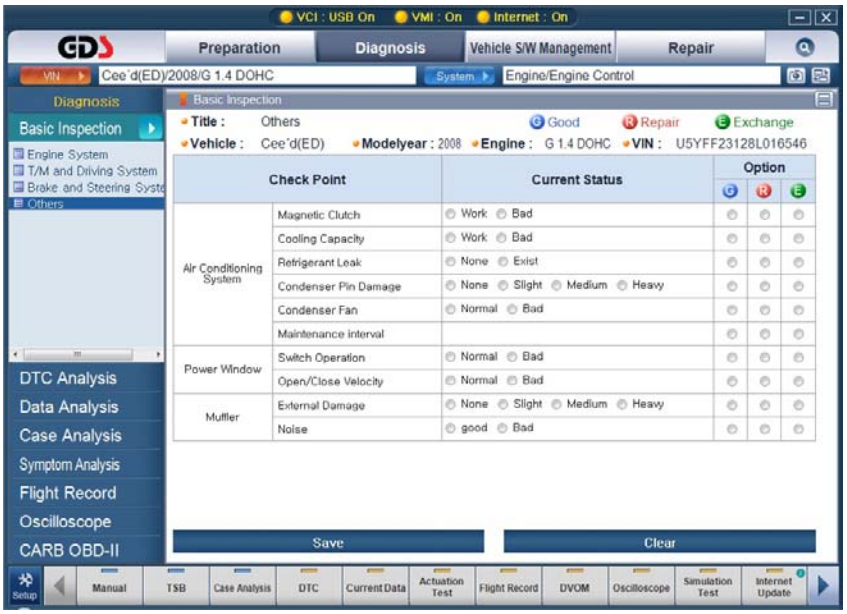


Figure 4. Basic Inspection – Other Systems

DTC Analysis

The "DTC Analysis" function retrieves DTC data from a specific system and retrieves diagnostic procedures/TSB data for any DTCs found.
There are three ways to access this function:

- Select "DTC Analysis" from the main page.
- Select "Go To DTC Analysis" from the "Fault Code Searching" window after selecting a specific DTC.
- Select the "DTC" button from the bottom of the main page.

TSB (in DTC Analysis): Function for accessing TSB information for the DTC found through the communication with the control module in the vehicle Selection.

DTC Searching

Configure setting for the diagnosis through the communication between VCI and vehicle control modules. Next, start diagnosis through the communication between VCI and vehicle control module by selecting the "DTC Analysis" menu as shown in [Figure 1].

Figure 1. DTC Analysis – Communication Open

DTC Result

After the communication with the ECU is established, DTC data will be retrieved and displayed on the upper section of the screen. Then related TSB list will be shown in the lower section.

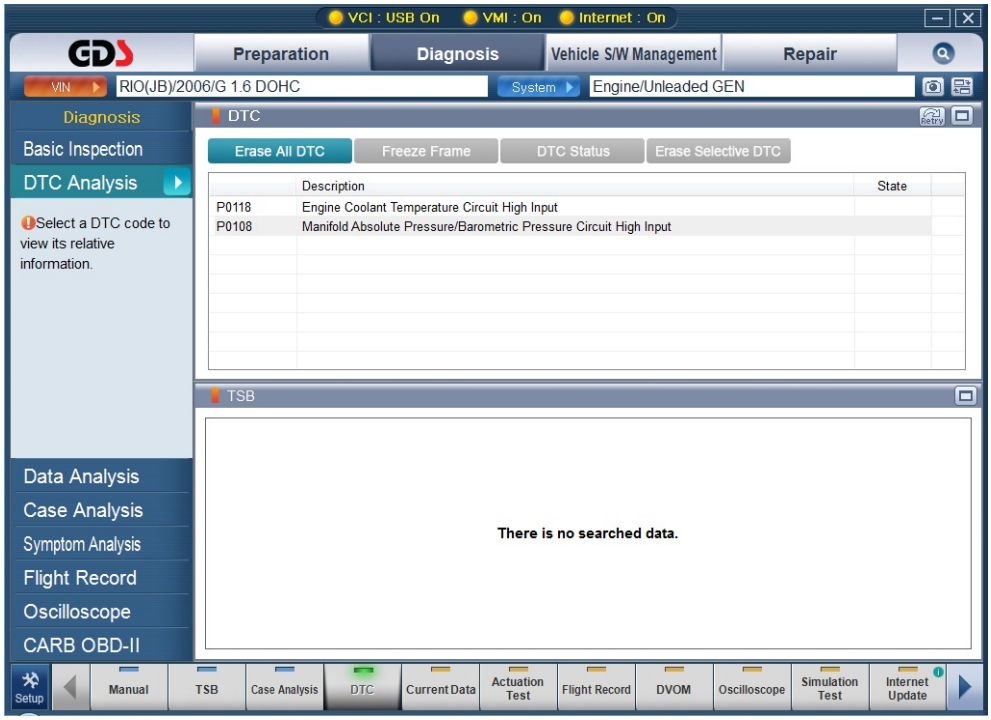


Figure 2. DTC Analysis – DTC Result

DTC Display

The state of a DTC is shown in the "State" field on the right-hand side of the screen. ("H" indicates a history code for supported systems; "P" indicates a pending code for supported systems.) In addition, the "DTC Status" function is available on supported systems to provide more information regarding a specific DTC.

The DTC display will update every 25 seconds; the display may be updated manually by selecting "DTC Analysis".

The screen configuration may be changed using the appropriate icons located at the upper-right portion of the display."

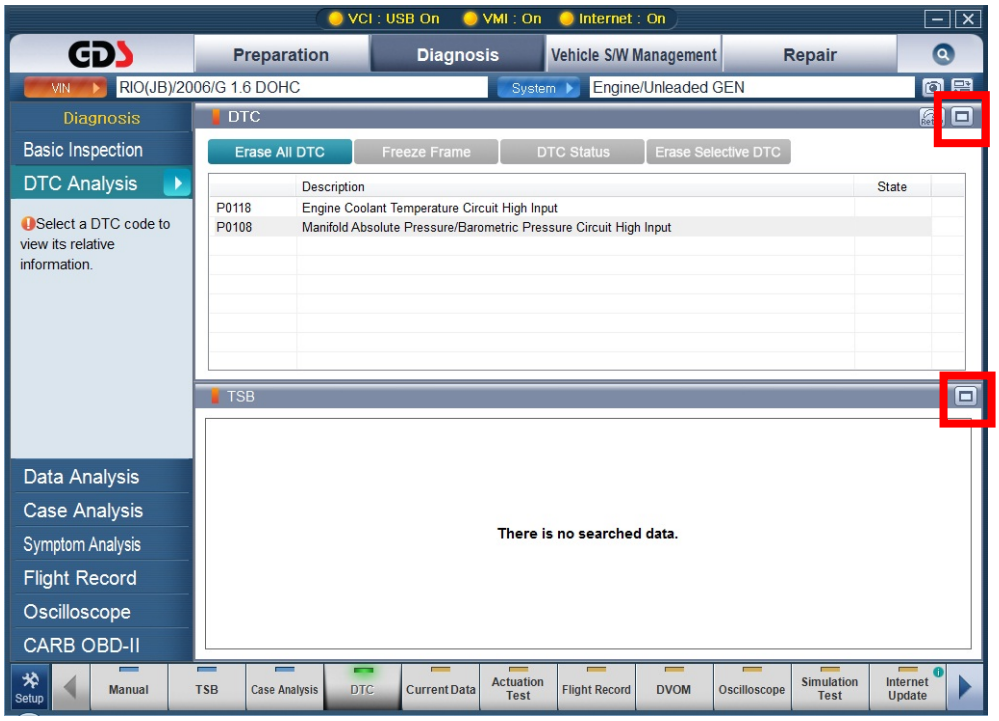


Figure 3. DTC Analysis - DTC Display-Split screen

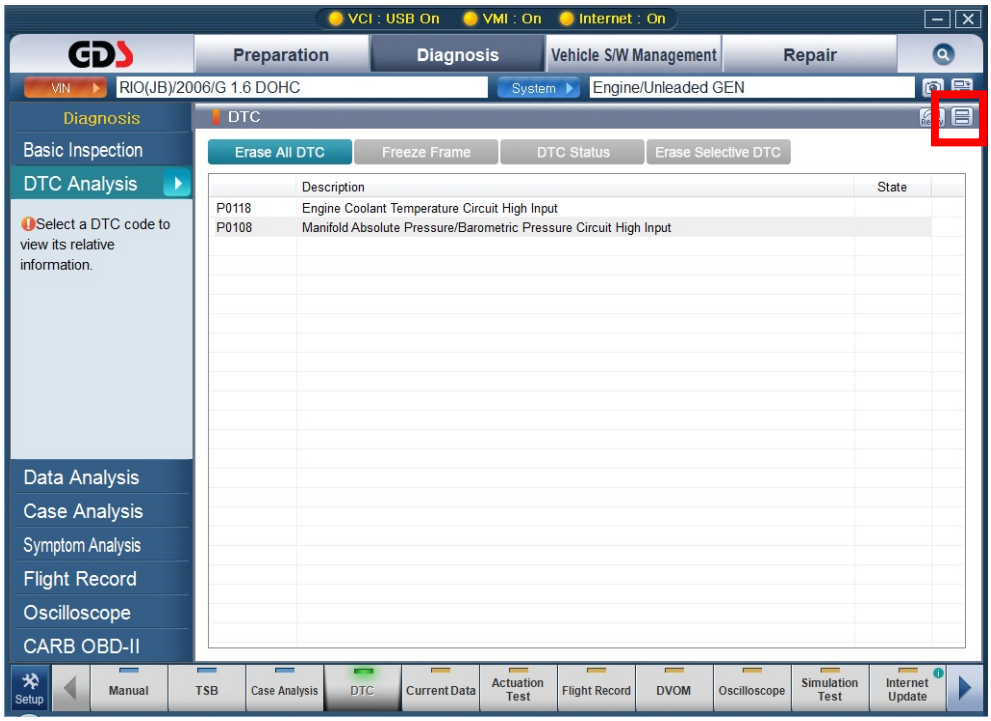


Figure 4. DTC Analysis - DTC Display-Full screen

DTC Erase

Erase All DTC

Selecting the "Erase All DTC" button will clear DTC data in the current ECU.

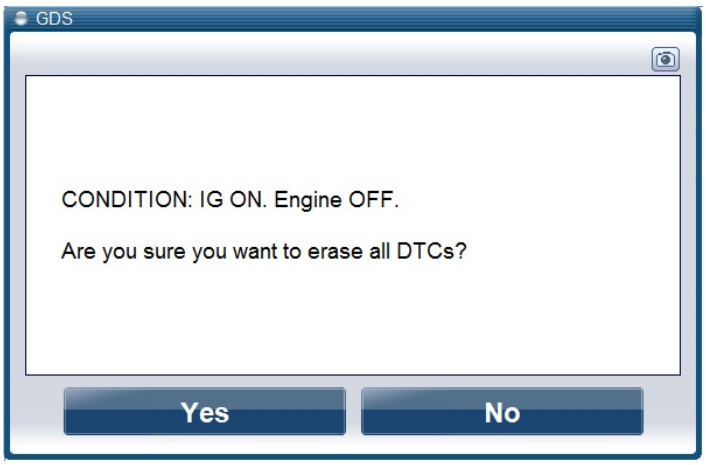


Figure 5. DTC Analysis - Erase All DTC

Erase Selective DTC

"Erase Selective DTC" button function is for erasing the selected DTC information form the assigned control module. "Erase Selective DTC" function is only for supported control modules. To erase DTC item, first choose the item and press "Erase Selective DTC" button.

Freeze Frame Display

The FREEZE FRAME DATA displays the data values stored in the Engine Control Module at the point when the first confirmed DTC (Engine ECU Only) is detected.

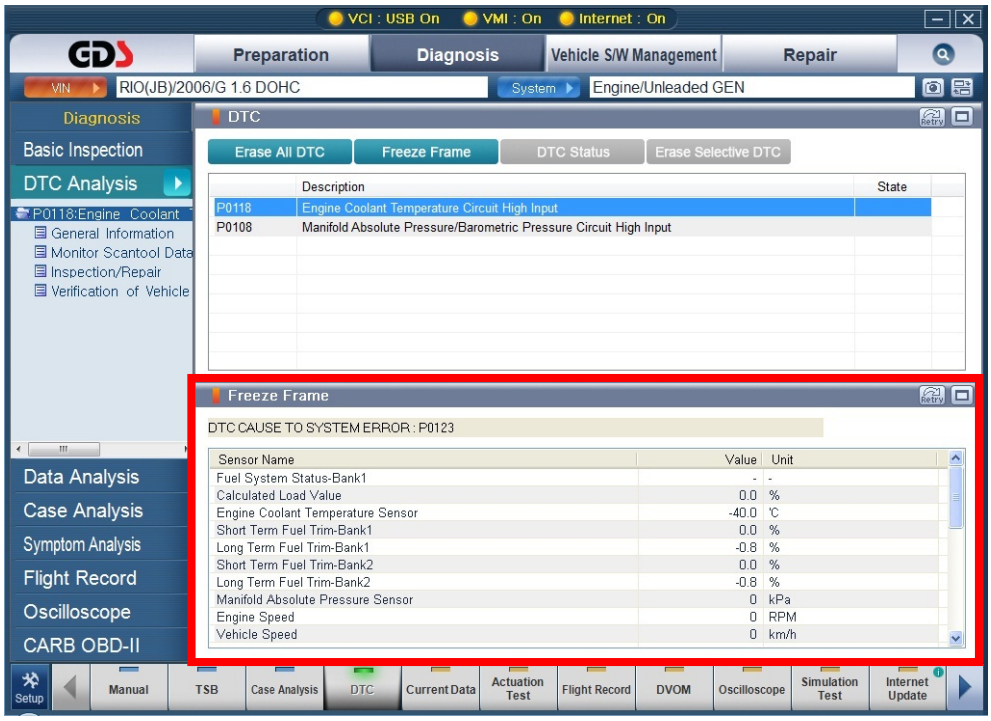
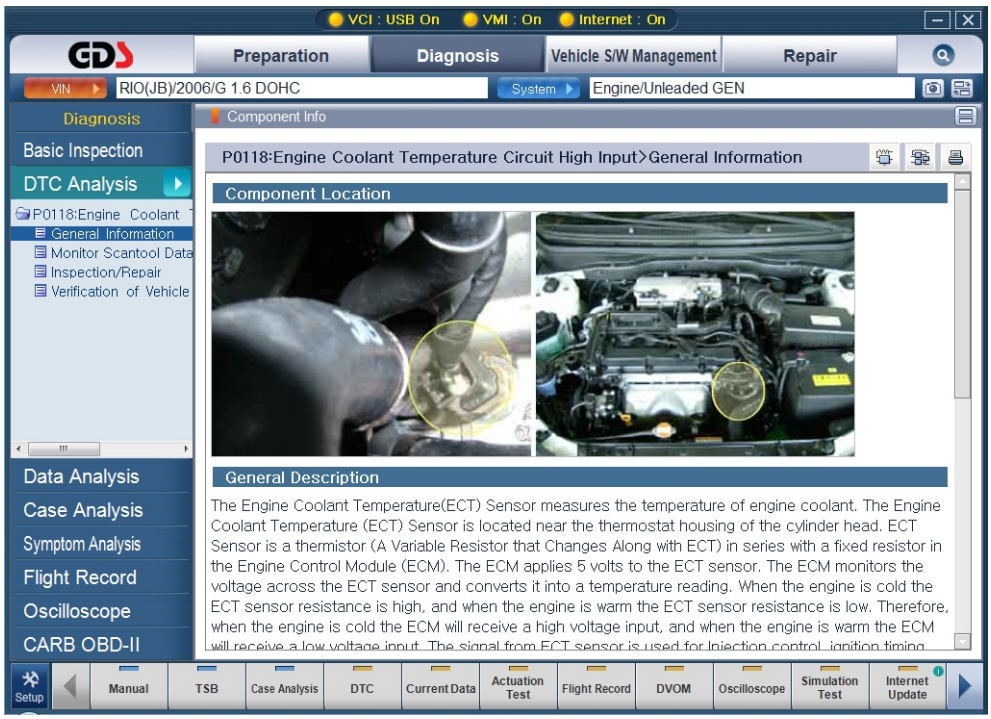


Figure 6. DTC Analysis – Freeze Frame

DTC Guide

After selecting a DTC procedure from the left-hand menu, the following options (dependent on specific DTC) will be displayed:" Component-level and system-level wiring diagrams (DTC dependent) are also available.

- **General Information**
- **Monitor Scantool Data**
- **Inspection/Repair**
- **Verification of Vehicle**
- **Full Circuit**
- **Component Circuit**



- **Figure 7. DTC Contents – General Information**

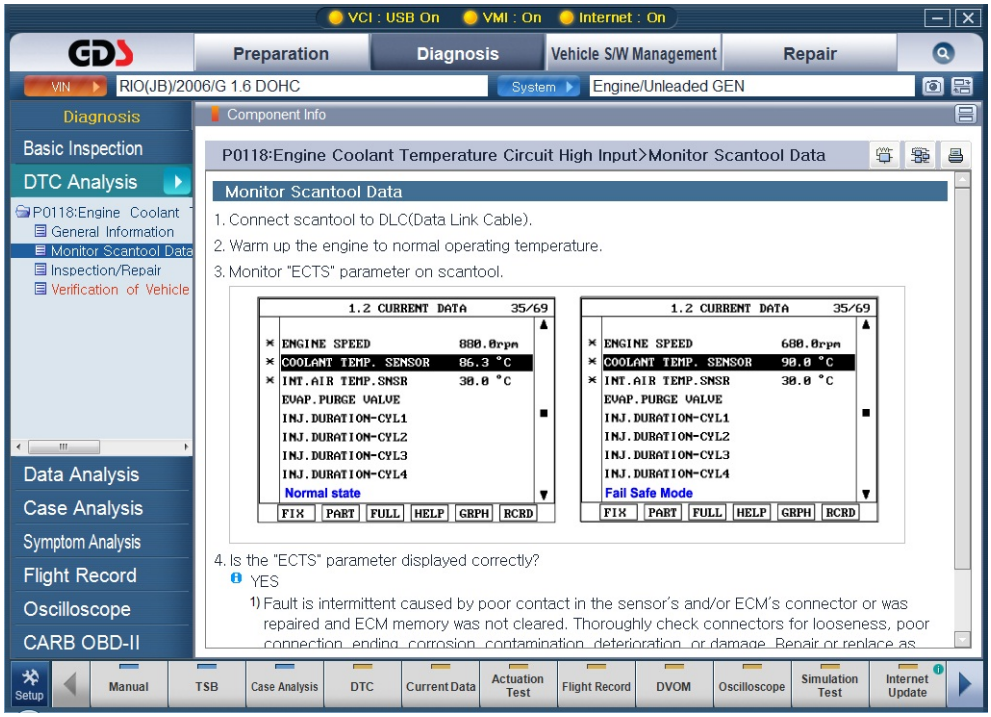


Figure 8. DTC Contents – Monitor Scantool Data

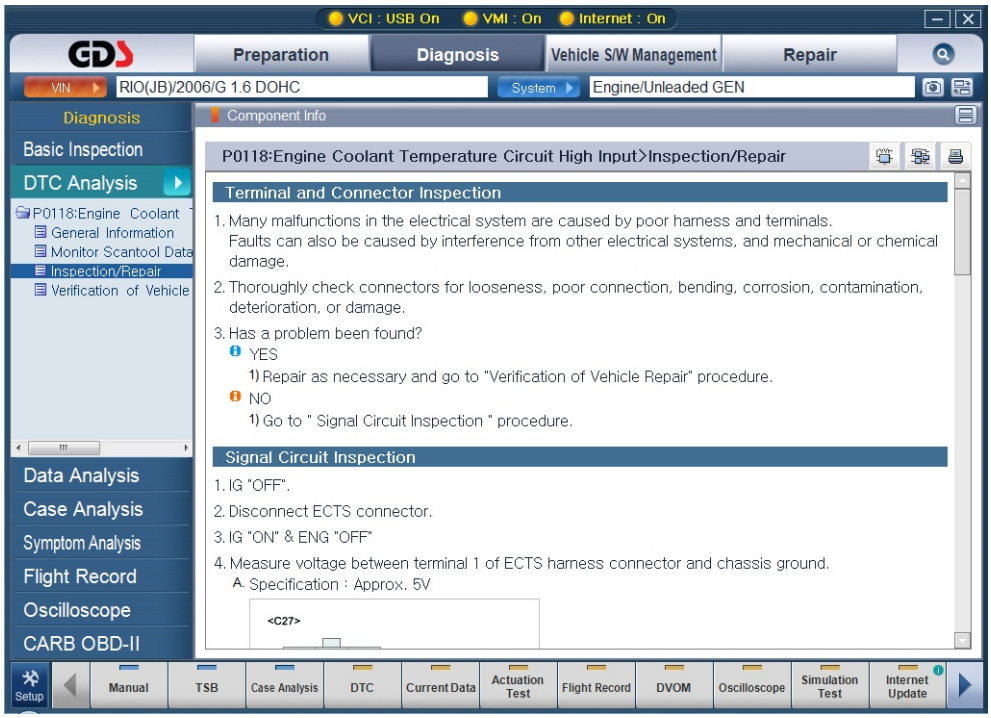


Figure 9. DTC Contents – Infpection/Repair

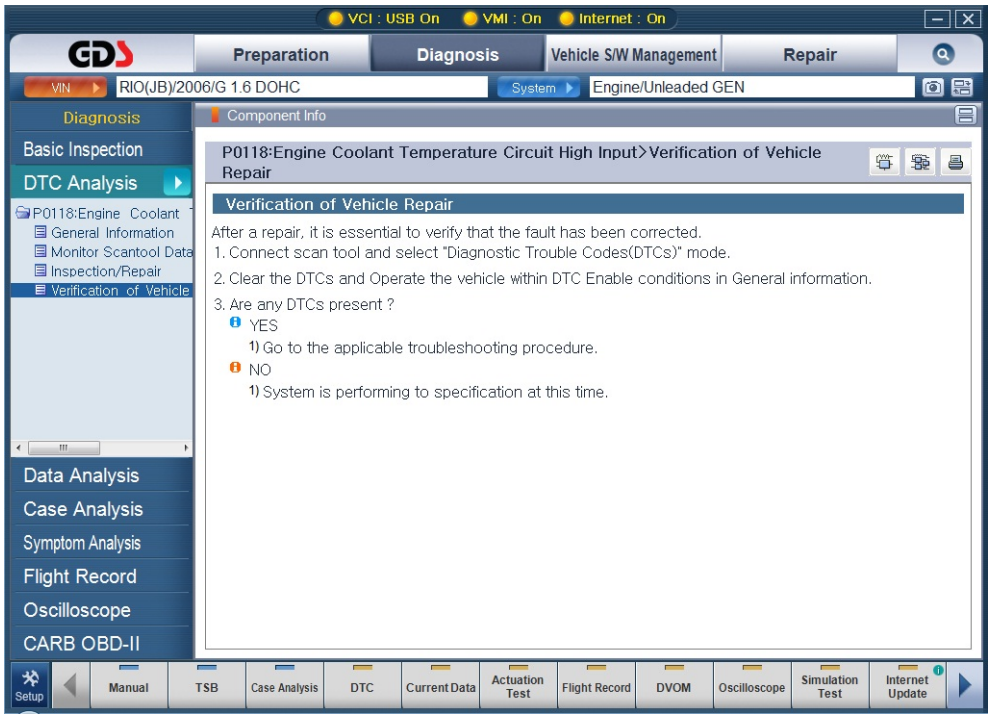


Figure 10. DTC Contents – Verification of Vehicle

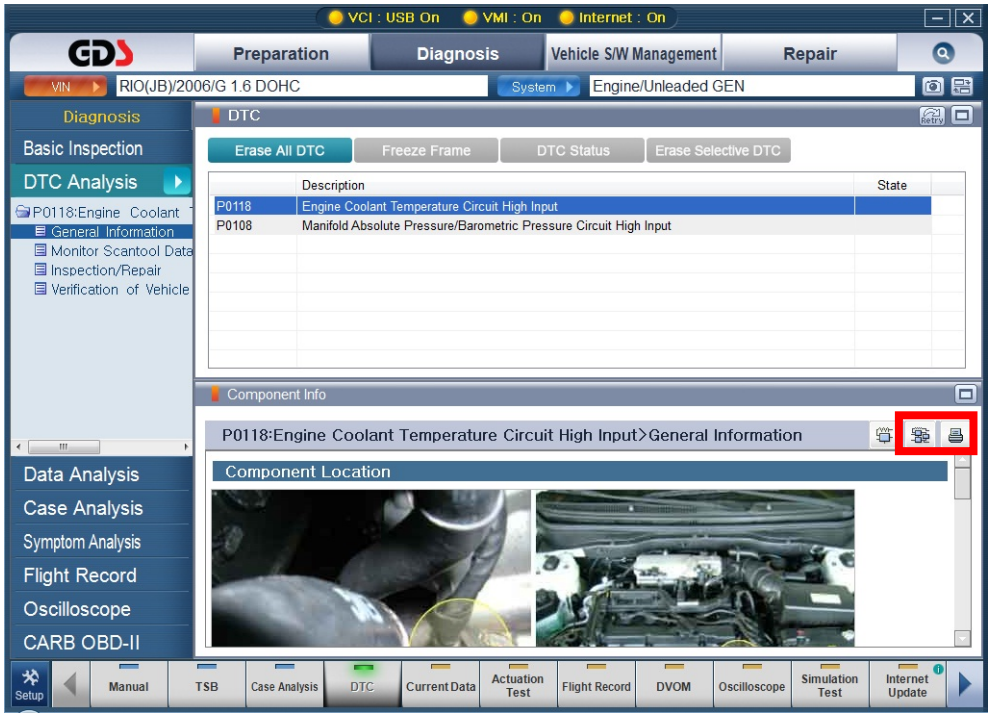


Figure 11. Circuit Diagram

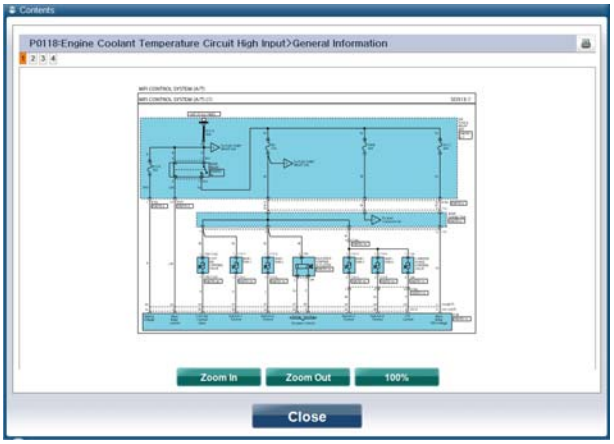


Figure 12. DTC Contents – Full Circuit

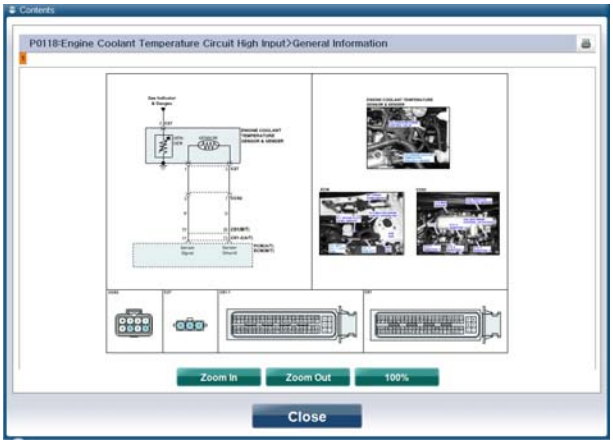


Figure 13. DTC Contents – Component Circuit

Data Analysis

To monitor ECU input/output information (Current Data), the user may select "Data Analysis" from the main page or "Current Data" from the bottom of the screen."

Communication open of current data

Configure setting for the diagnosis through the communication between a VCI and a vehicle control module. Run diagnosis through the communication between the VCI and vehicle control module as shown in [Figure 1].

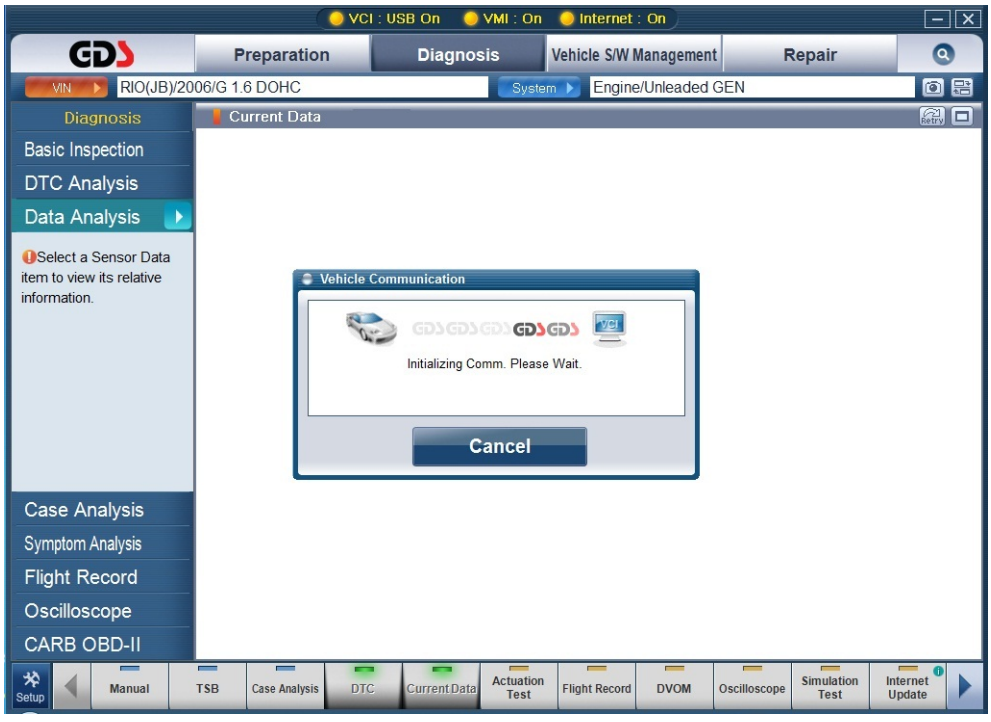


Figure 1. Data Analysis – Communication Open

Monitoring for Current Data

The screen will display Current Data and DTC data in a split-screen view as shown below. Expand the Current Data window by selecting the icon marked.

Note: The speed GDS updates data parameters (refresh rate) depends on the communication protocol used by the ECU for data transmission.

If you want to view Current Data on Full-screen, click the button marked as shown below.

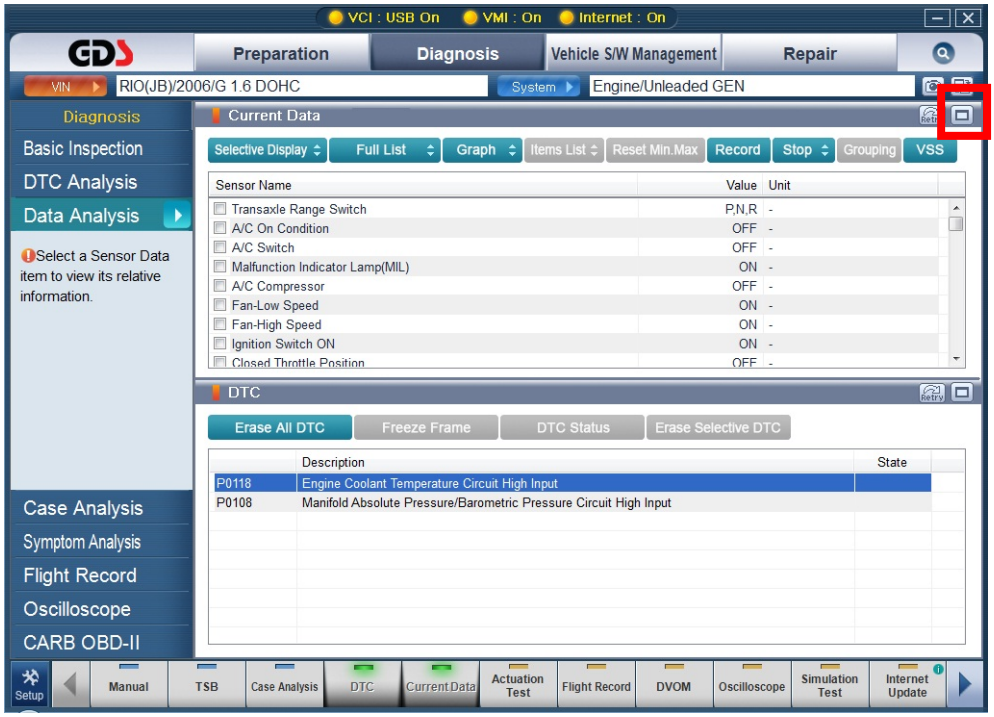


Figure 2. Data Analysis – Monitoring

The Functions buttons that are active in the Current Data page are shown below.

Icon	Description
	Function to renew data values for specific items. It toggles with "Normal Display"
	Functions to renew data values for all items. It toggles with "Selective Display"
	Function to show Current Data items in two division (right and left) to show more items. It toggles with "Standard List"
	Function to show Current Data items in one division. It toggles with "Full List"
	Function to show Current Data values in numbers. It toggles with "Graph"
	Function to show Current Data values in graph. It toggles with "Text"
	Function to change Current Data items in the Graph mode.
	Function to reset the Max. or min. value of Current Data in the Graph mode
	Function to save "Current Data" in Data File Form to the PC or VCI.
	Function to simulate by vehicle speed signal output. This function is not in service.

Normal / Selective Display

The "Selective Display" function updates selected data parameters (maximum of 8). The default mode is "Normal Display" (all data parameters are updated). Select data parameters by checking the box next to the parameter name; click "Selective Display" to enable the function. Click "Normal Display" to switch back to the default mode.

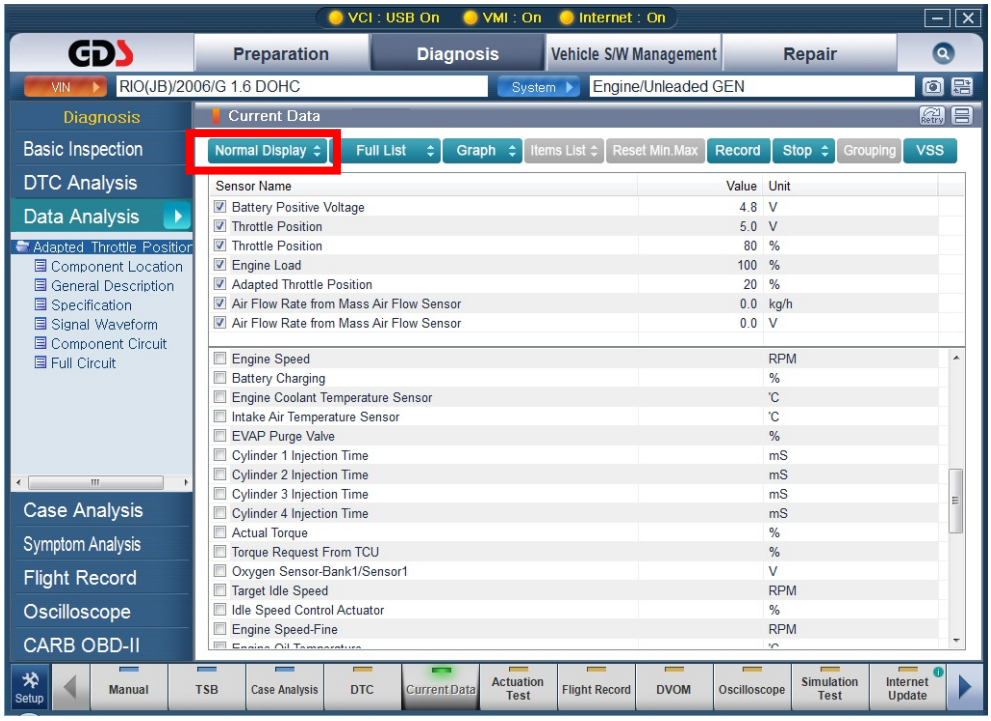


Figure 3. Data Analysis – Selective Display

Full List / Standard List

The difference between "Full List" and "Standard List" is the output method for the "Current Data" items.
"Standard List" shows items in one column and "Full List" shows in two divisions.
"Selective Display" and "Graph" functions are not available in "Full List" mode.

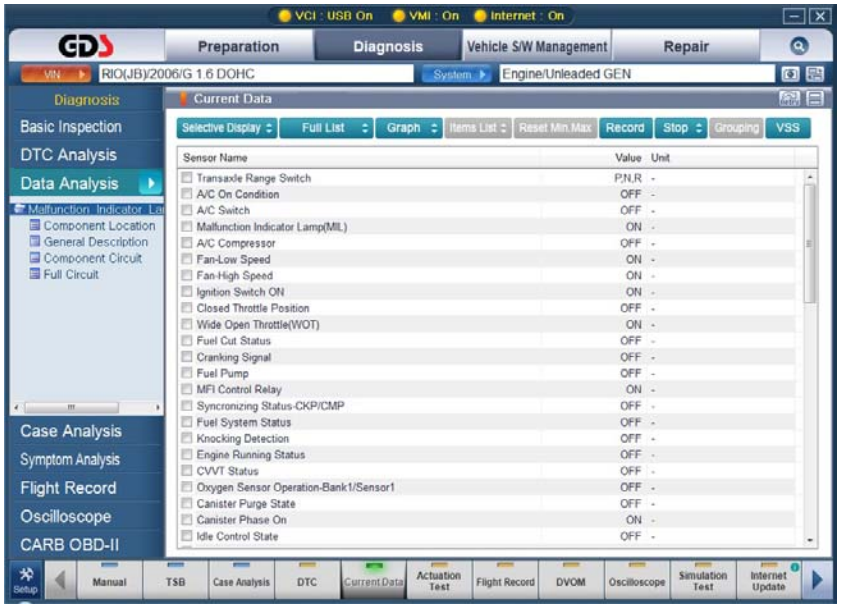


Figure 4. Data Analysis – Standard List

Figure 5. Data Analysis – Full List

Text / Graph

The default display format is "Text" mode. To switch to "Graph" mode, perform the following:

- Select up to 8 data parameters.
- Click the "Graph" button.

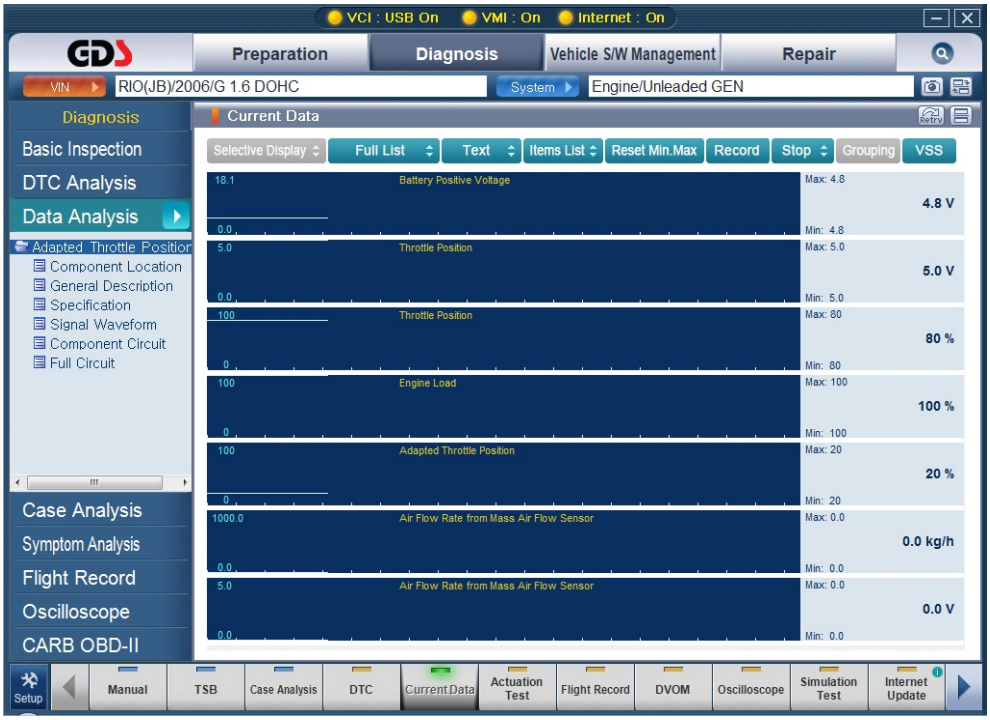


Figure 6. Data Analysis -Graph

In Graph mode, minimum and maximum values will display on the right-hand side of the screen; use the "Reset Min/Max" button to reset these values.

To add or remove items from the graph, select the "Item List" button. Currently selected items are marked with an asterisk (*). Click on an item to add or remove (8 items maximum). Click the "Item List" button to switch back to "Graph" mode.

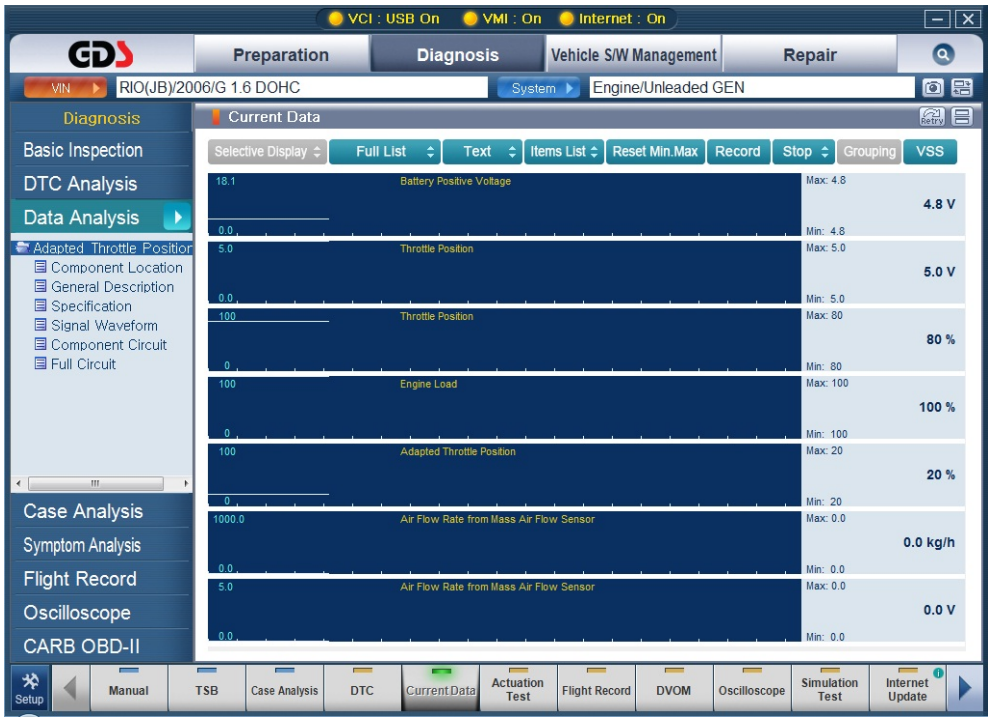


Figure 7. Data Analysis -Graph-Min & Max

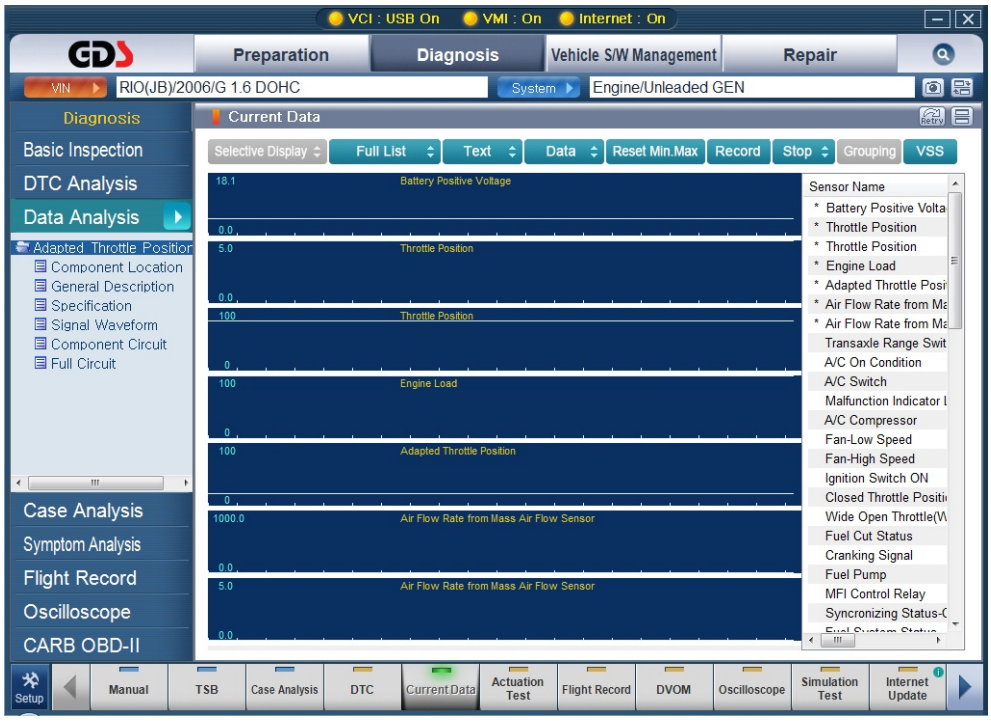


Figure 8. Data Analysis -Display item change

VSS

VSS is a function to run simulation by Vehicle Speed Signal output.

Record

Function to save "Current Data" to PC or VCI in "Data File" format.
This function will explain from 'Flight Record Review' section.

Current Data Analysis Functions

When using "Text" mode, additional information is available for supported Current Data items:

- Component Location - Shows the location of the selected component.
- General description - General information related to the selected component.
- Specification - Applicable specifications for the selected component.
- Signal Waveform – Standard waveform on selected item can be analyzed.
- Component Circuit - Wiring diagram showing only the selected component and related wiring.
- Full Circuit - Full wiring diagram for the system related to the selected component.

Click on a Current Data Parameter to access this information.

Sample screens are shown on the following pages.

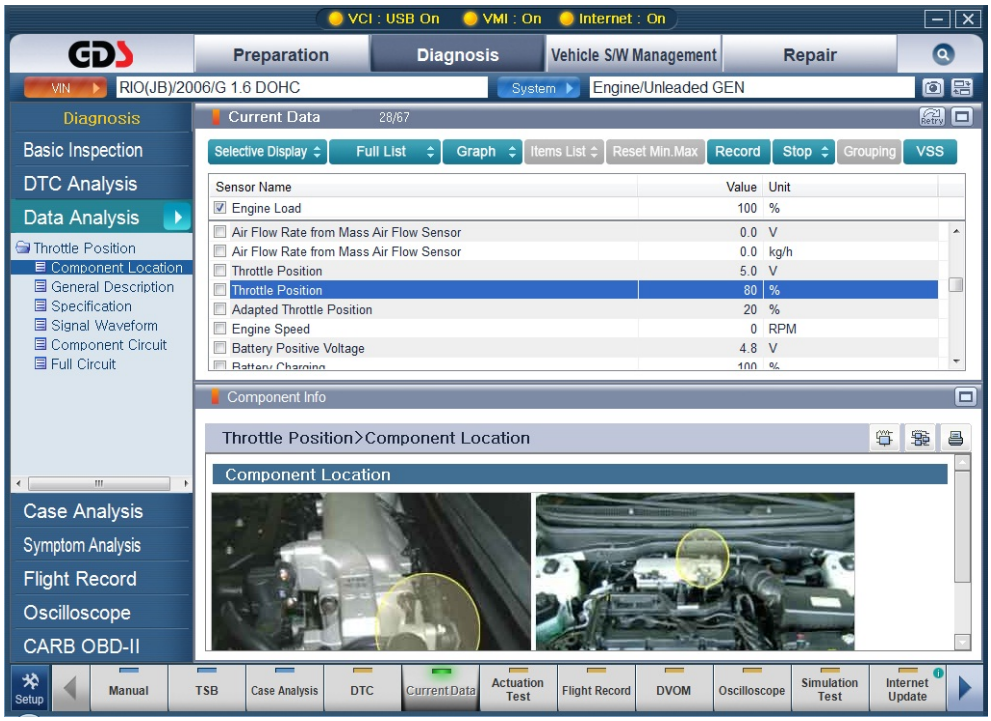


Figure 9. Data Analysis Contents– Component Location

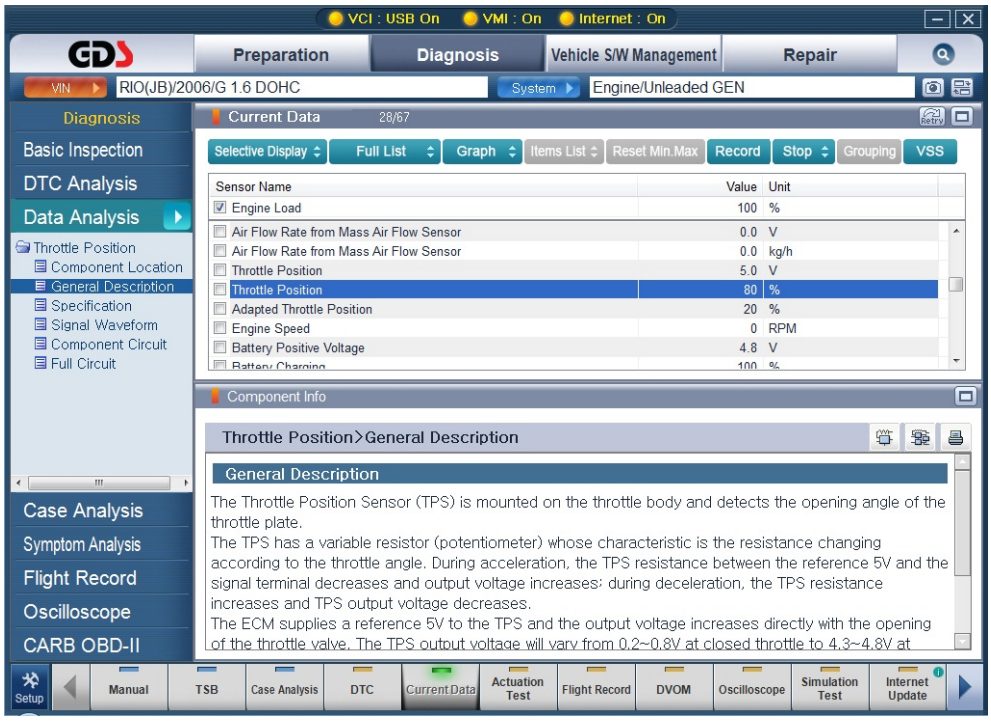


Figure 10. Data Analysis Contents– General Description

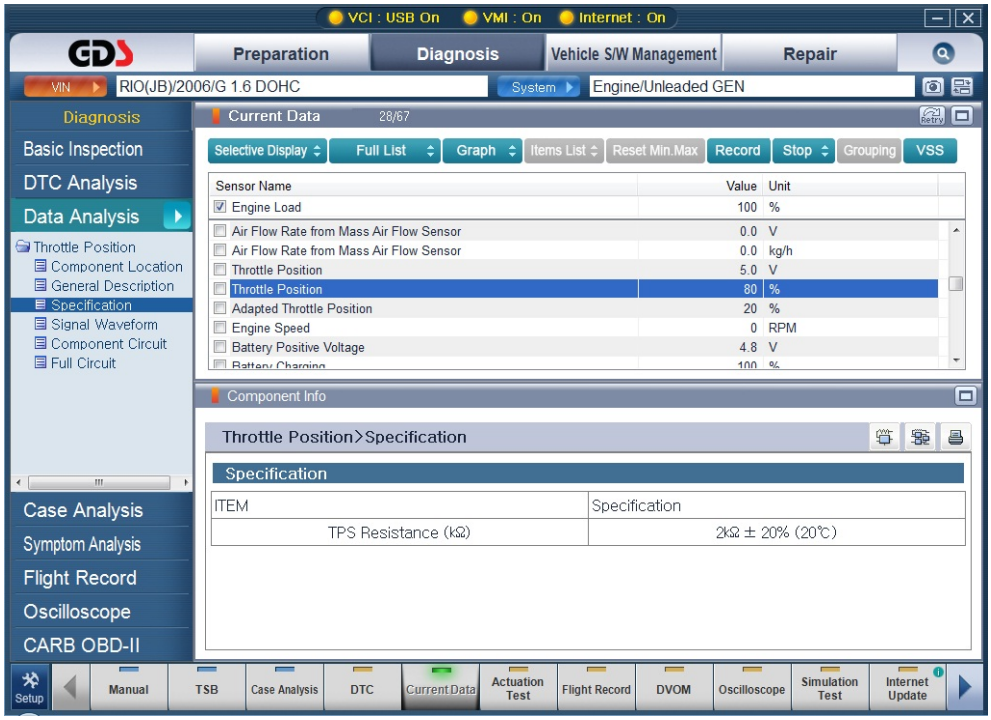


Figure 11. Data Analysis Contents– Specification

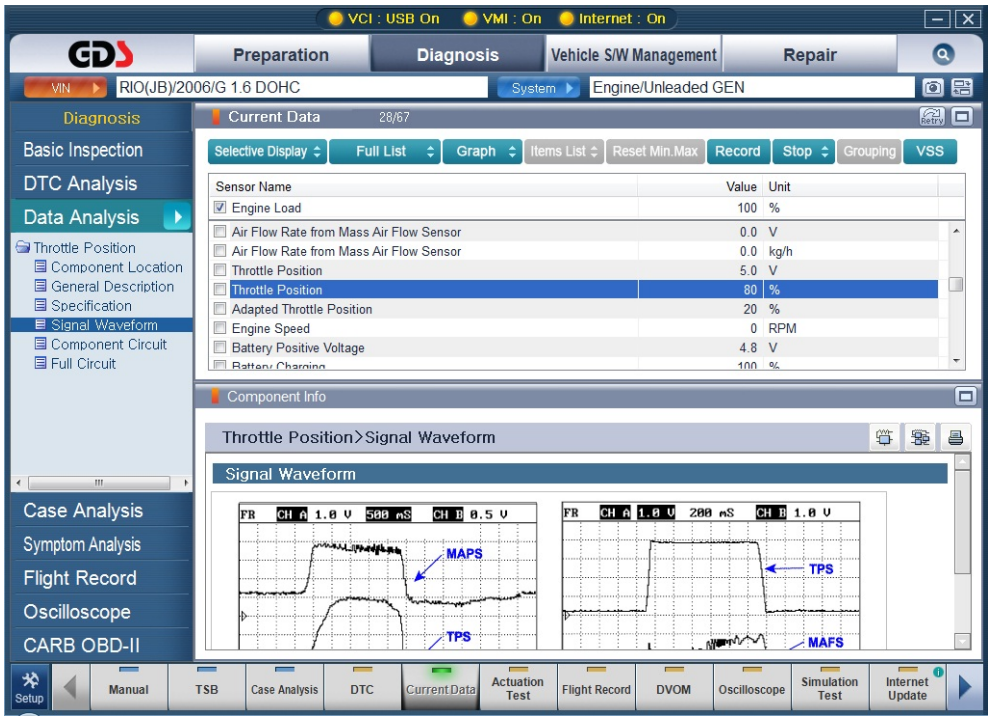


Figure 12. Data Analysis Contents– Signal Waveform

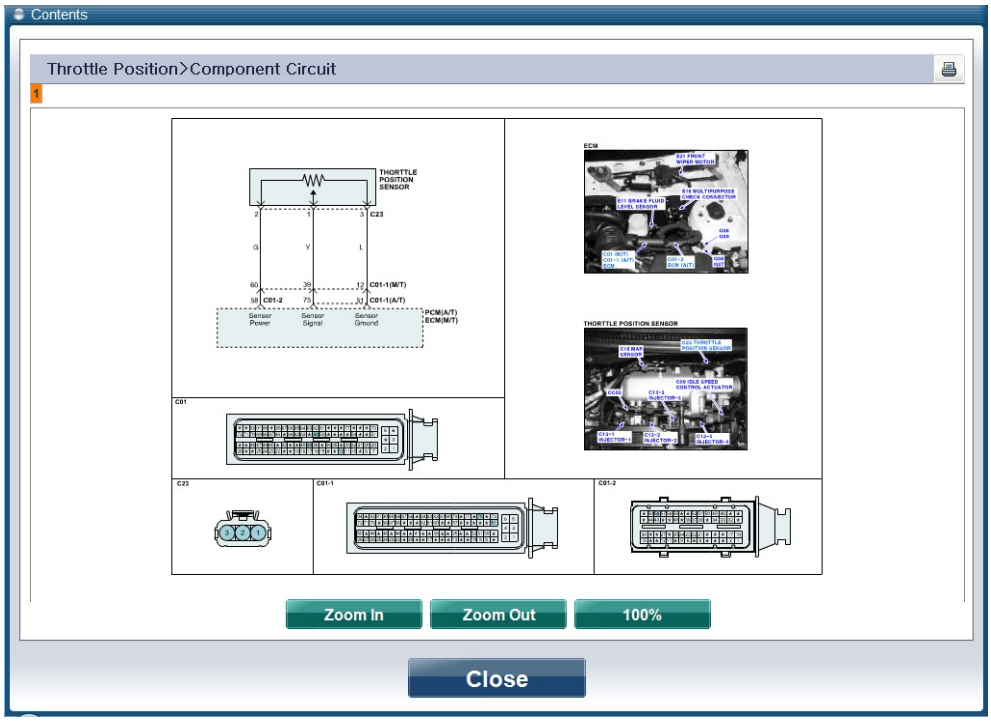


Figure 13. Data Analysis Contents– Component Circuit

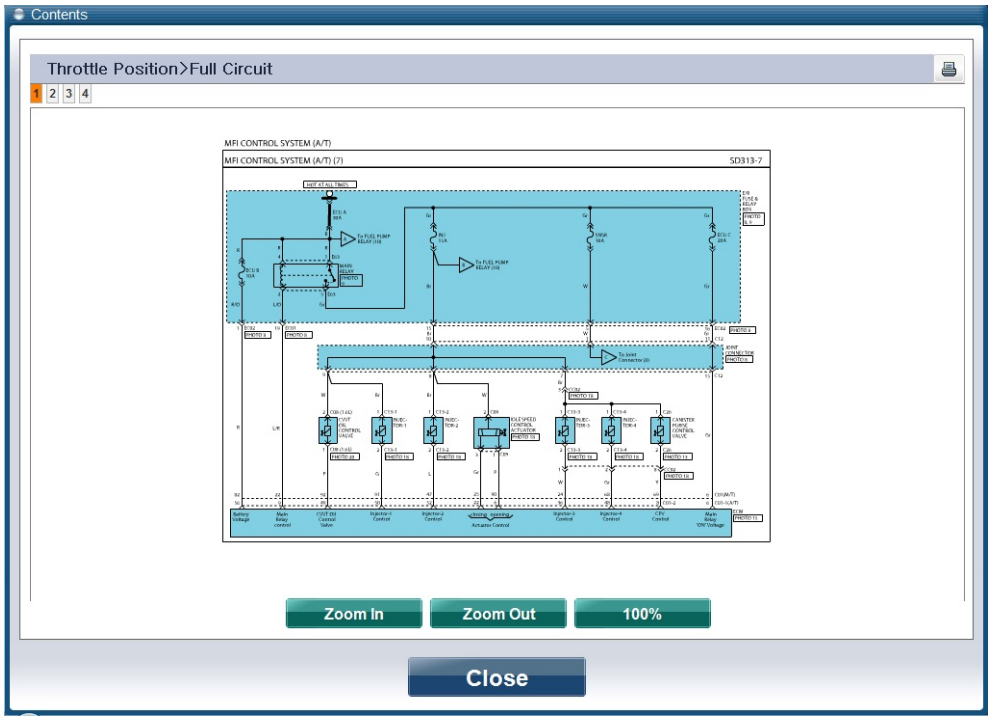


Figure 14. Data Analysis Contents– Full Circuit

Case Analysis

"Case Analysis" function in the "Diagnostic Guide" menu classifies diagnostic guide cases into module groups (Engine, Transmission, and brakes…). It also classifies specifically into symptoms and supports the most effective repair cases for each symptom.

In Case Analysis, the "Match" mode only checks the selected symptoms for the selected vehicle in "**Vehicle Selection**", and "All List" mode will access every diagnostic case for selected vehicle.

- Match : Function to access diagnostic cases only for the selected vehicle.
- All List: Function to access diagnostic cases for all symptoms for selected vehicle.

There are two ways to use "Case Analysis" function. The first way is to use "Case Analysis" menu in "Diagnosis" section at the initial main page. The second way is to use "Case Analysis" menu after the selection of "Diagnosis" button in the main menu of the sub screen as shown in [Figure 1].

Match

Case Match menu in the left column of Case Analysis displays the Sub-symptoms that user selected in the VIN selection. Cases related to the symptom can be found in right hand corner.

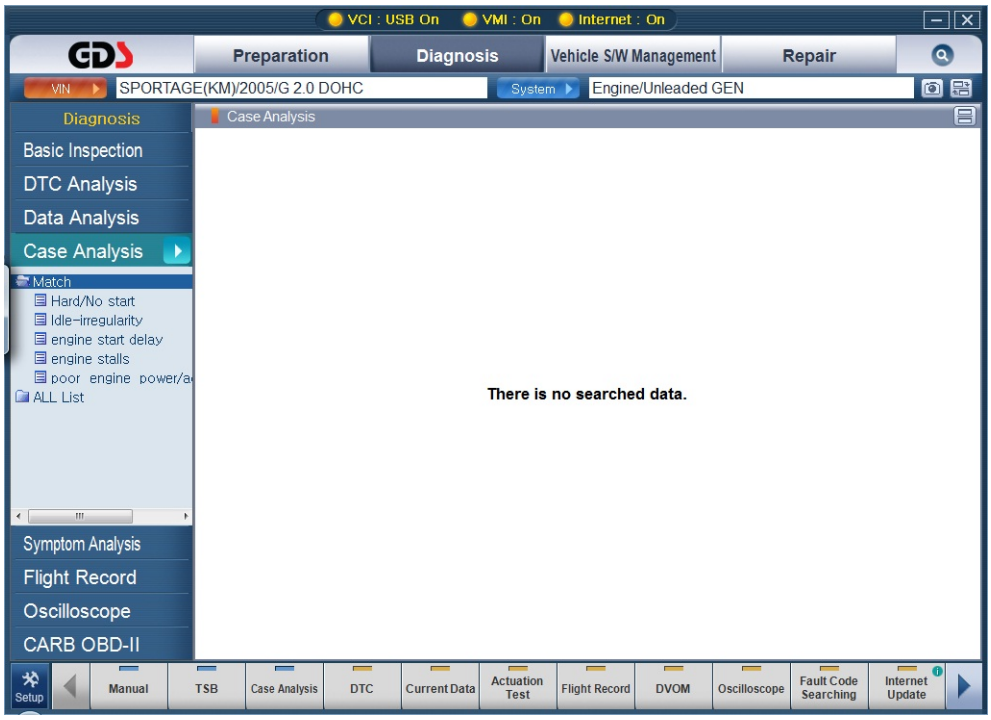


Figure 1. Case Analysis-Match

All List

With the "Case List" menu selected, all the module groups with symptoms for the selected vehicle appear on the left menu.

Selecting the each symptoms will show relevant case information in bulletin form.

If there is no relevant diagnostic case related to the symptom, the message "There is no searched data" will be displayed.

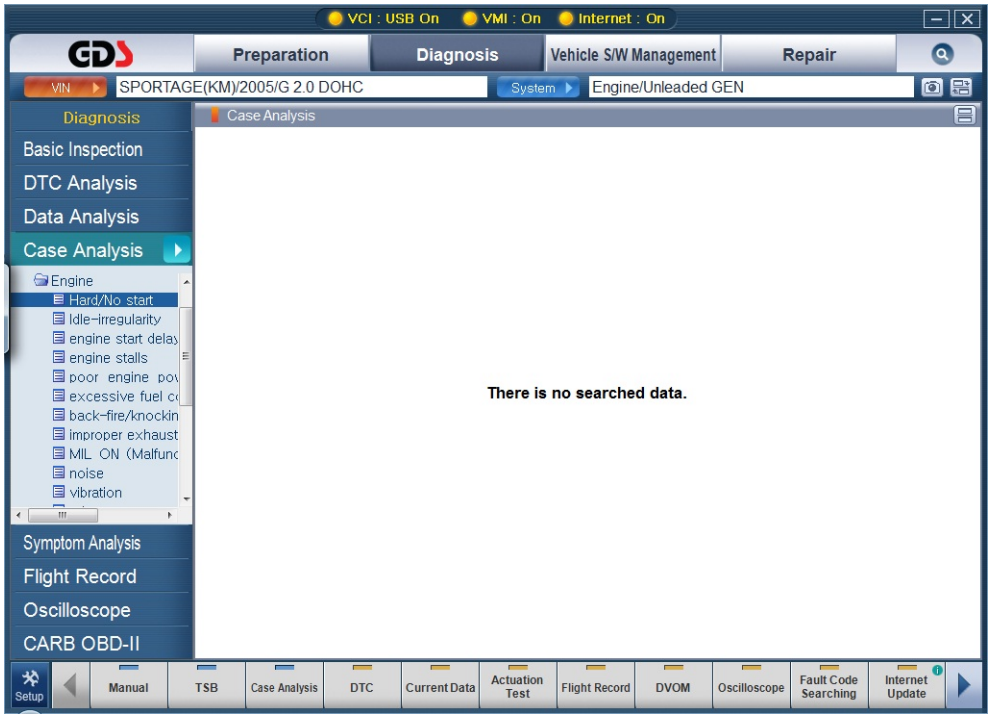


Figure 2. Case Analysis- All List

Case analysis open

When the user selects the subject name from the case list the Bulletin containing corresponding content for that case appears as a pop-up window.

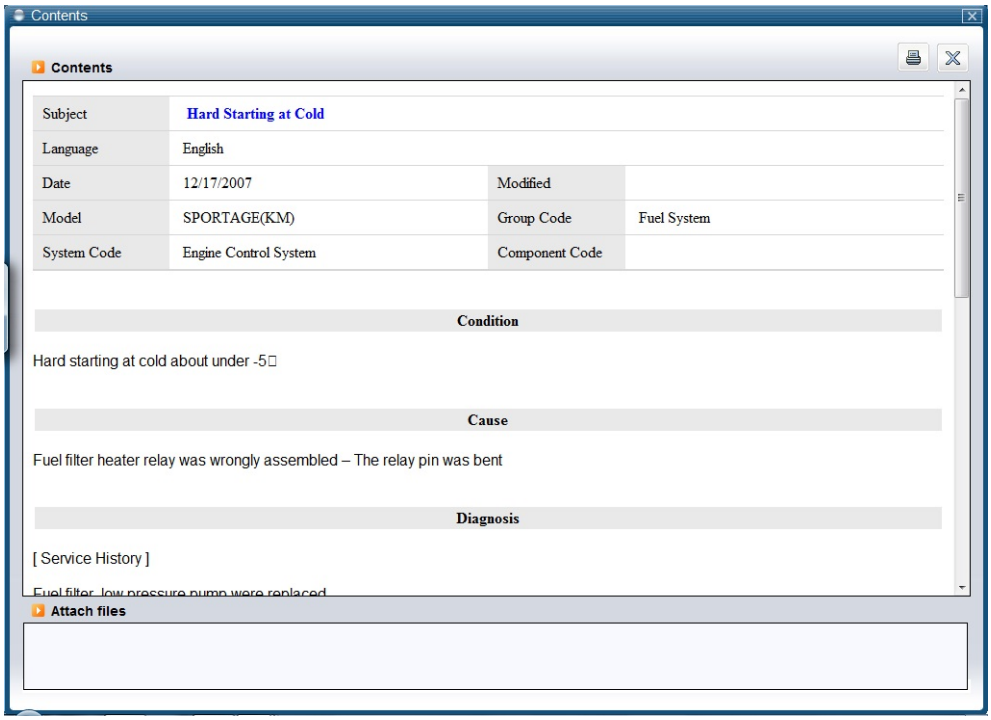


Figure 3. Case Analysis-Contents Open

Symptom Analysis

The "Symptom Analysis" function in the "Diagnostic Guide" menu allows the user to access symptom-based troubleshooting data.

The "Symptom Match" function retrieves symptom troubleshooting data based on the symptoms entered at the VIN screen.

The "Symptom List" function retrieves all available symptom troubleshooting data for the selected vehicle.

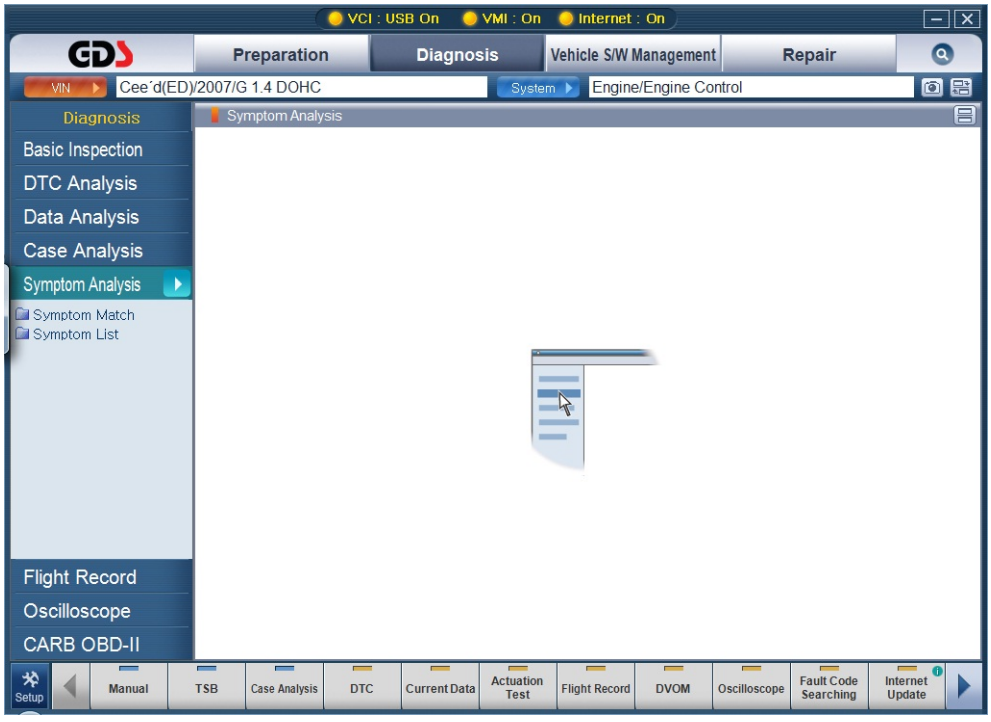


Figure 1. Symptom Analysis

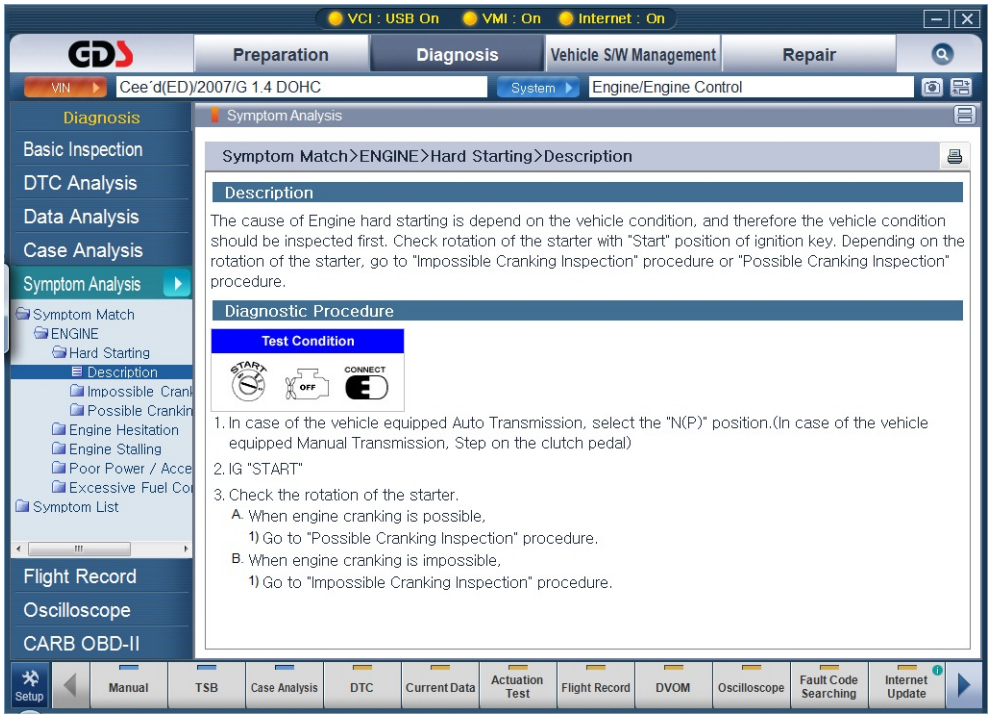


Figure 2. Symptom Analysis- Symptom Match

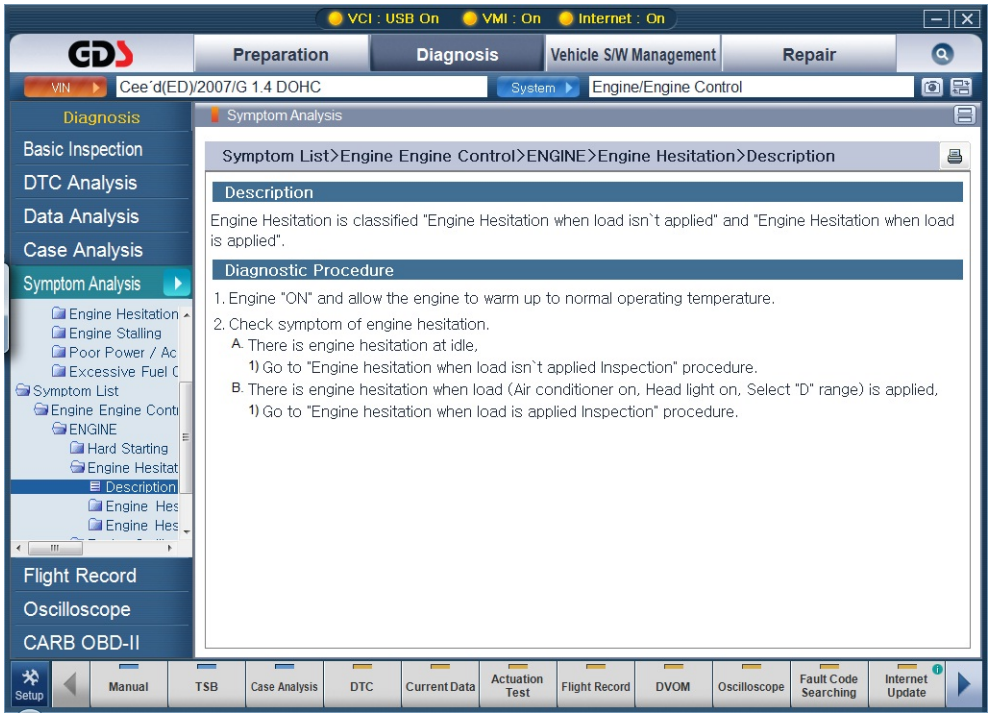


Figure 3. Symptom Analysis- Symptom List

Flight Record

"Flight Record" function enables the user to record systems data in PC or VCI, and to analyze the data in various ways and time settings. The data copied or saved on PC can be reviewed at any time.

Flight Record process can be triggered in two ways.

- Entering from Data Analysis page
- Entering "Flight Record" from the main page.

Recording Flight Record via Flight Record function

Select "Flight Record" button on the initial page. "Flight Record" menu tips page shown in figure 4. If the selection of vehicle and system is not yet completed, "GDS VIN Search" page will appear instead of "Flight Record" menu tips page.

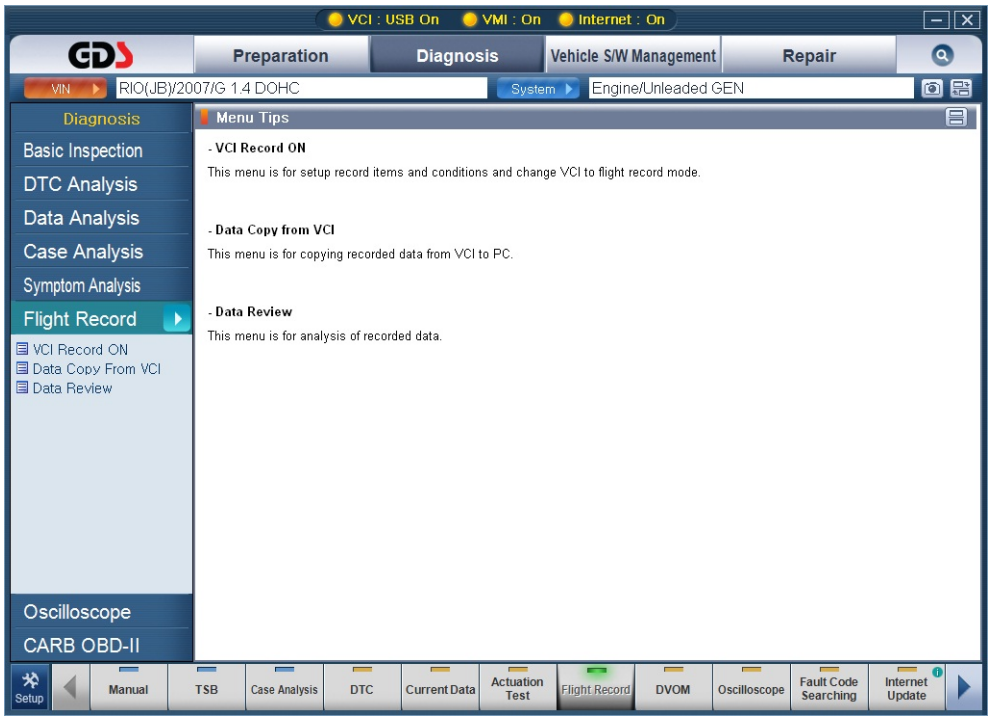


Figure 1. Flight Record initial screen

Click "VCI Record ON" from the list on the left to go to next step as shown in Figure 2.

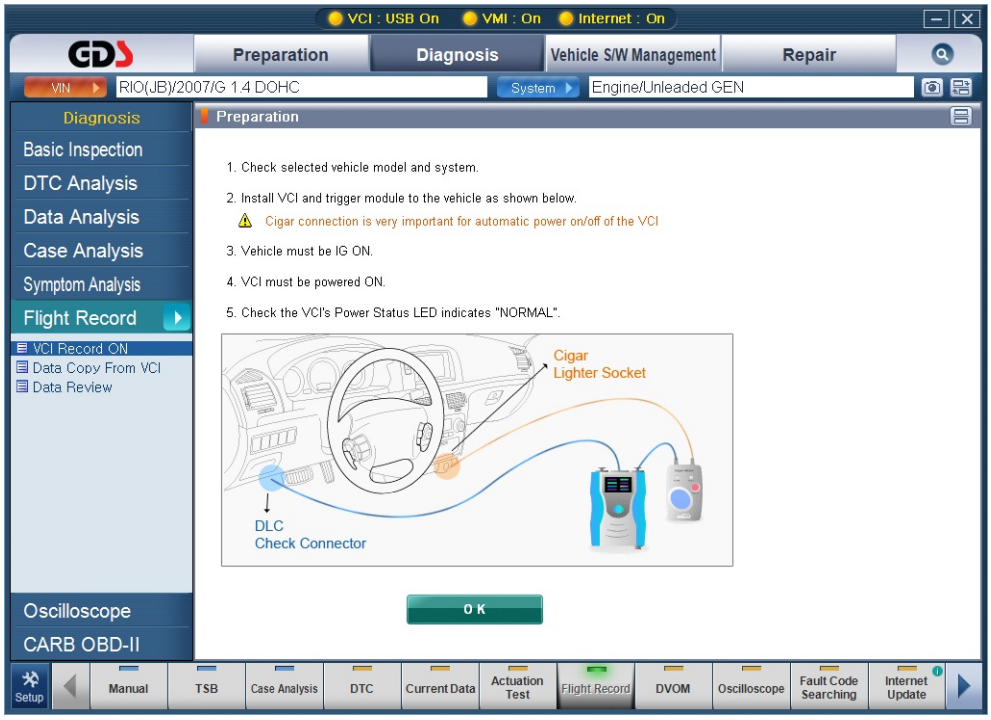


Figure 2. VCI Record ON screen

Refer to the 'Connection Guide' carefully, then click "OK". A list of sensor data will be displayed as shown in [Figure 3]. Select sensors to record, then click "Record Condition" button.

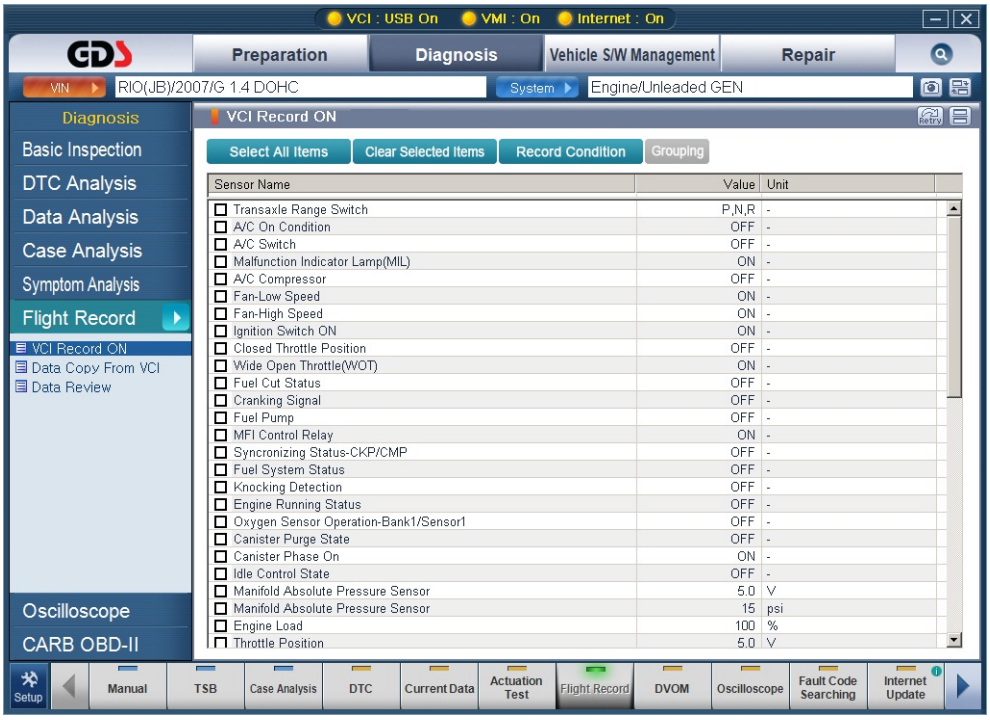


Figure 3. List of recordable data

Icon	Description
Select All Items	Selects all items for recording.
Clear Selected Items	Deselects all selected items.
Record Condition	Go to next step to customize Record mode after selecting items.

Click "VCI Record" button after setting configuration for Trigger Setting, Recording Item, Recording Time for one event.

If there are existing recorded files stored in the VCI, a pop up window as shown in Figure 5 will be displayed. And if "YES" is clicked, all the left recorded files will be erased and go into VCI Record Mode. But if "No" is clicked, Flight Record Mode will be canceled and go into next Mode, "Data Copy From VCI" .

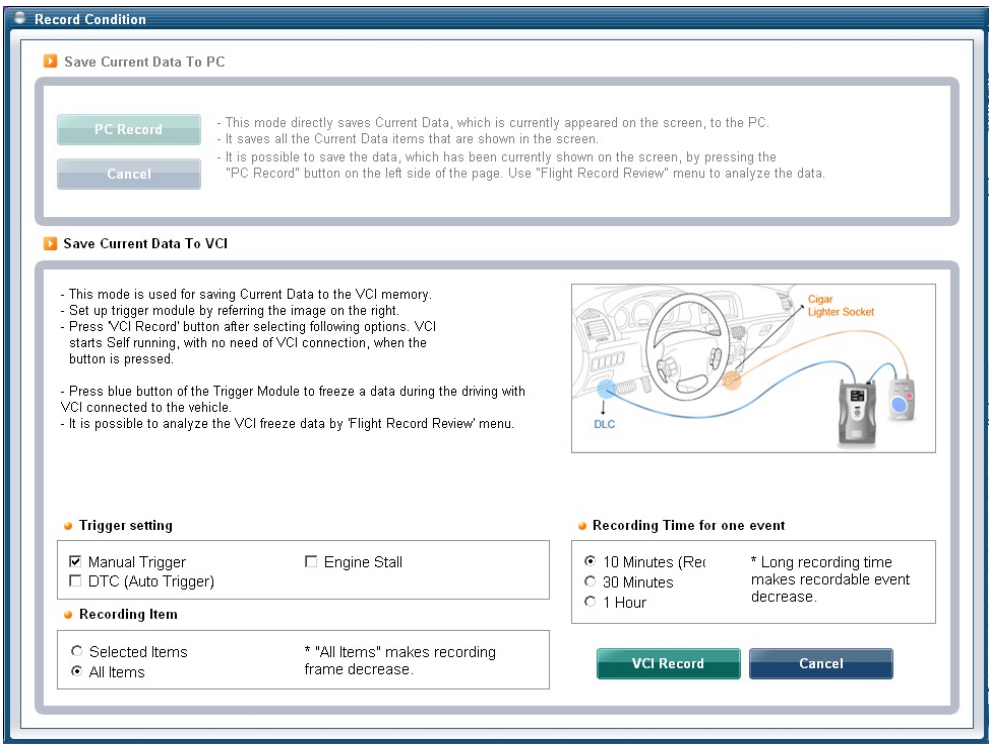


Figure 4. Record Condition

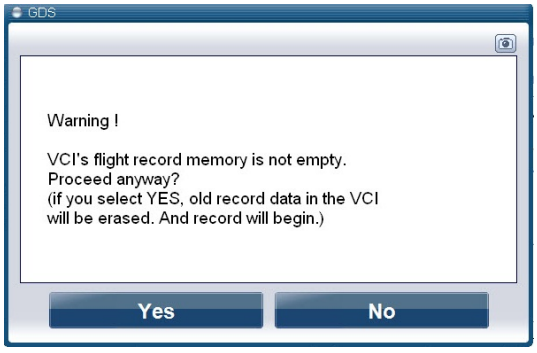


Figure 5. VCI with existing recorded files left.

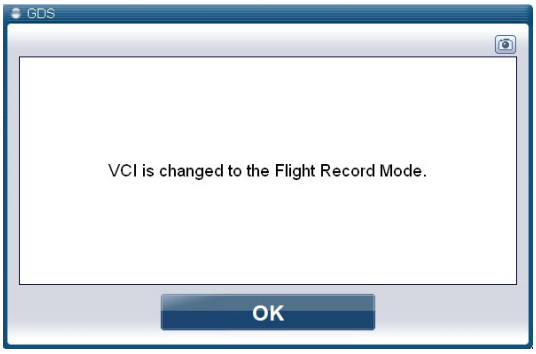


Figure 6. VCI save Mode

Recording Flight Record files from Data Analysis to PC

Click 'Data Analysis' button on the initial page of GDS program to access the Flight Record function. This opens the 'Data Analysis' page shown in figure 7. If the selection of vehicle and system has not been completed the **'Vehicle Selection'** page will appear instead. The 'Flight Record' function cannot be accessed without this information. Refer to manual page A-02-008 for **'Vehicle Selection'**.

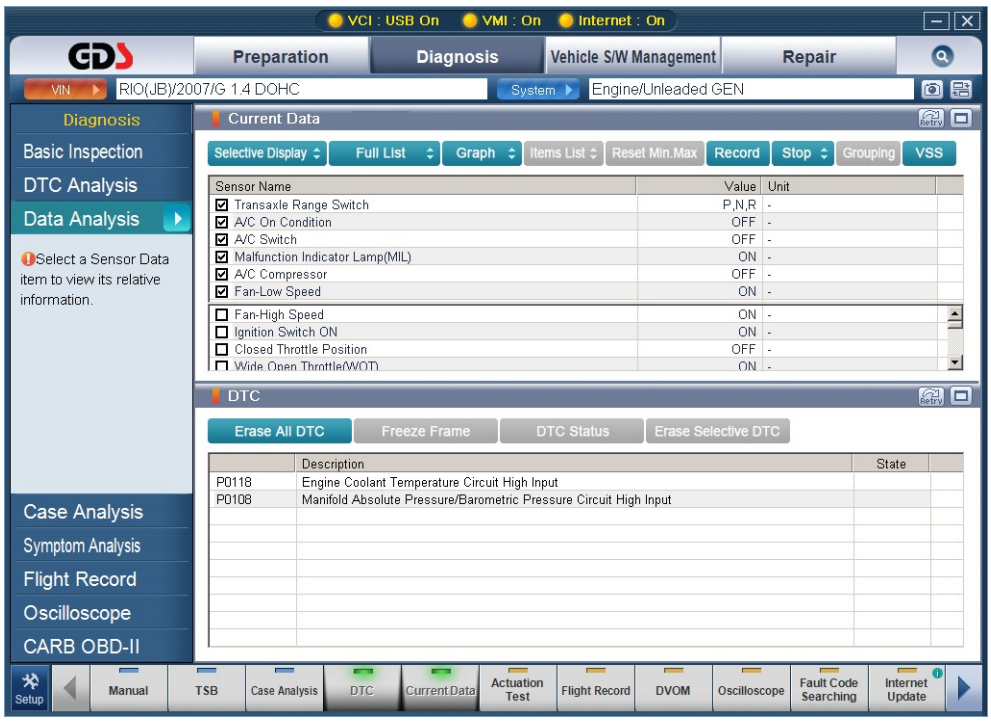


Figure 7. Select the item on Data Analysis page

This mode saves 'Current Data', which is currently shown on the screen, to PC by pressing 'Record' button on the right side of the 'Current Data'. It only saves the checked items, which appear in the 'Current Data' window. When an item on the list is changed, it starts a new store point from that time. It is possible to save the data, which has been currently shown on the screen, by pressing the 'PC Record' button on the right side of the 'Record Condition' page. Use 'Flight Record Review' menu to analyze the saved data.

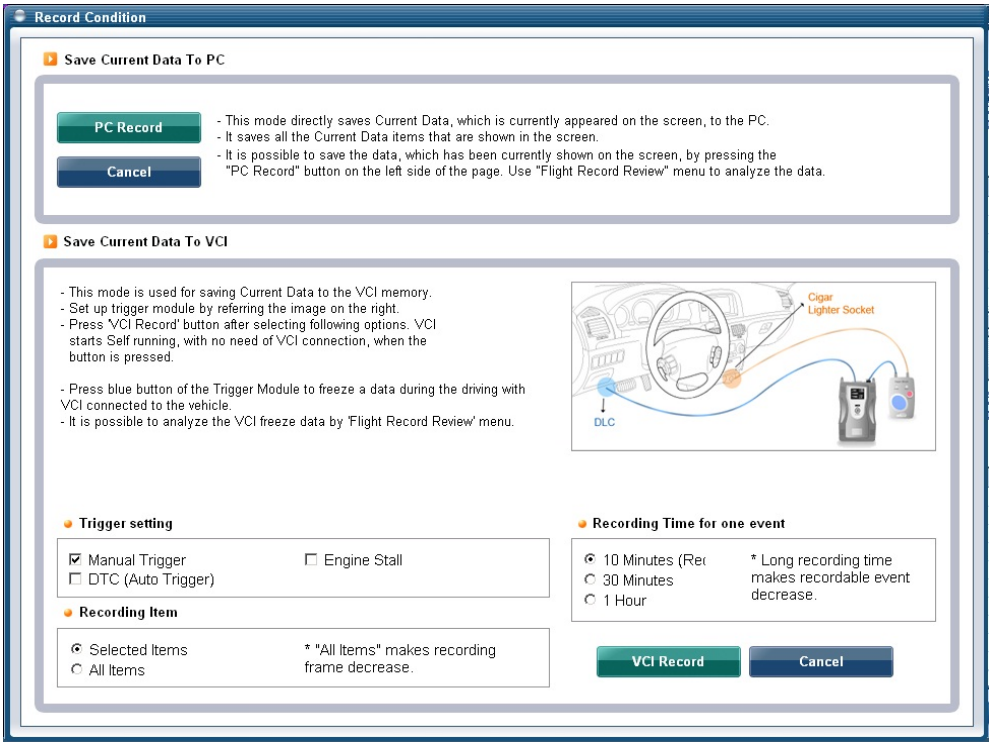


Figure 8. Record Condition window

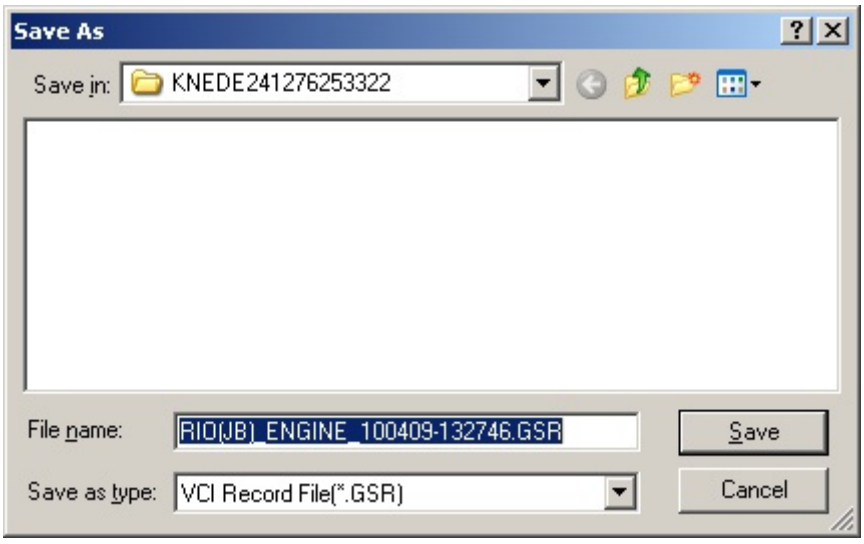


Figure 9. Save the Record File to PC

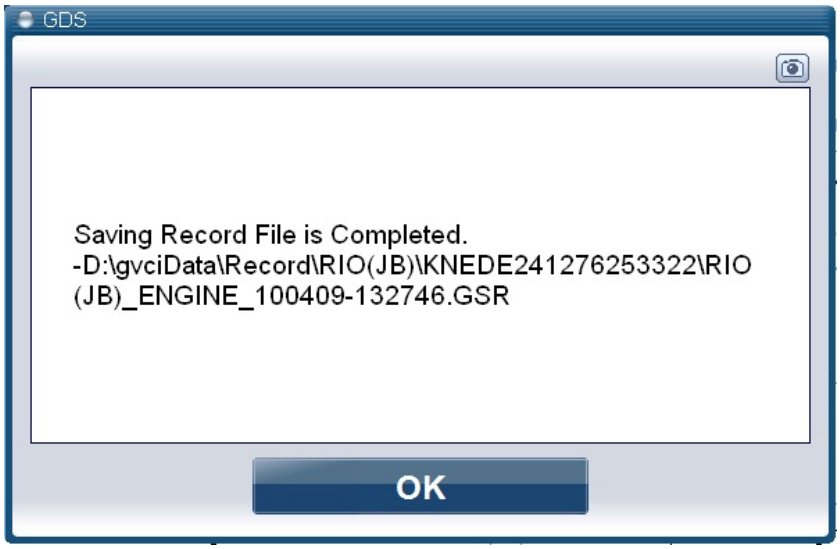


Figure 10. Complete the File saving

Recording Flight Record files from Data Analysis to VCI

Click "Data Analysis" button on the initial page of GDS program to start the Flight Record. Starting page of the 'Data Analysis' shown in figure 11 will appear as below. If the selection of vehicle and system is not yet completed, **'Vehicle Selection'** page will appear instead.

Refer to manual page A-02-008 for **'Vehicle Selection'**.

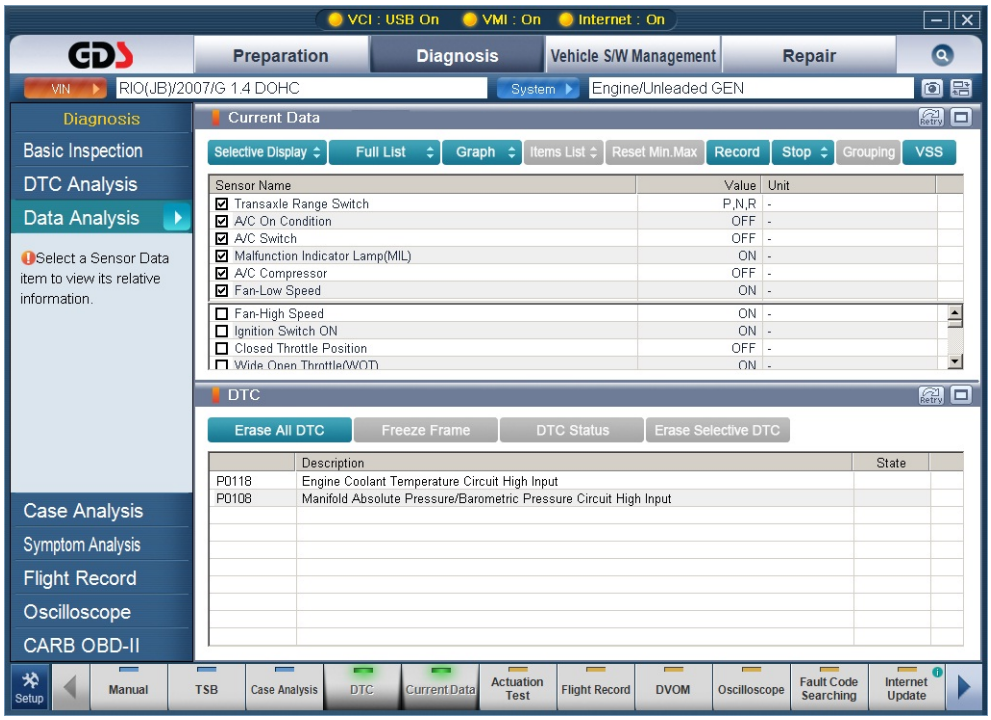


Figure 11. Select the item on Data Analysis page

After selecting, the items to record press the **'Record'** button on the right side of the 'Current Data' window.

This brings up the menu for configuring the VCI to flight record mode. To change the VCI module to Record mode you must connect the VCI module and Trigger module to the vehicle. (REFER TO SECTION A-01-005 'Installation of Trigger Module and Cigar Power Cable') by referring to Figure 7. Connect the trigger unit to the Cigar lighter socket this will provide a power On/Off signal to the VCI. The vehicle Ignition must be ON. VCI power must be ON and that the VCI Power Status LED indicates "NORMAL". Next, Select the Recording conditions on the lower section of the page.

When everything is ready, click 'VCI Record' button in the lower right side of the section.

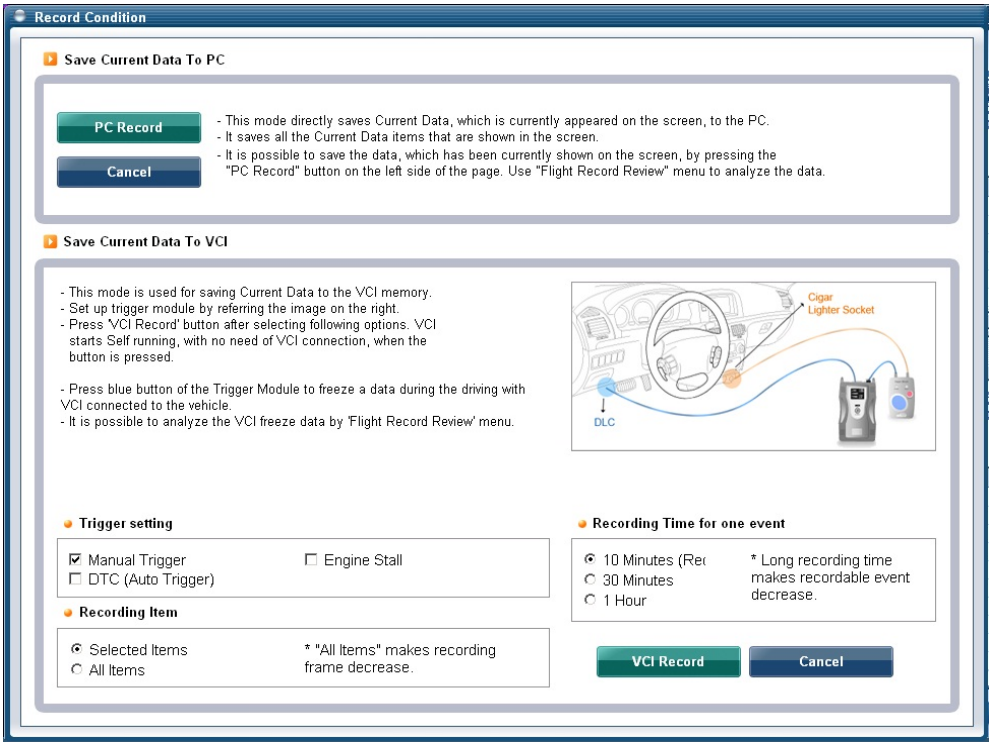


Figure 12. Record Condition

By clicking 'VCI Record' button a window will open that asks whether to change to Flight Record mode, **(Warning)** this window will delete any previous flight record data, will appear in order. Click YES and check that the VCI is in Flight Record mode. If there is unsaved, data in the VCI a **Warning** will display giving you a chance to save old data. Click **Yes** to continue with flight record setup

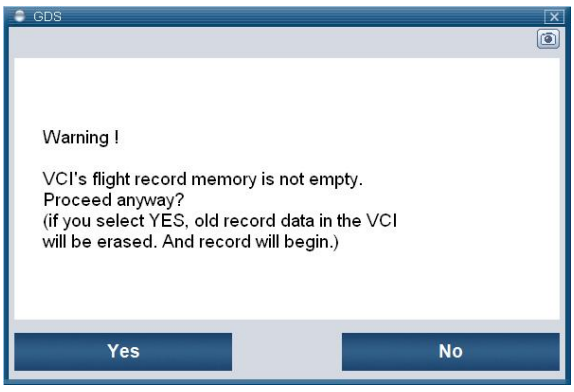


Figure 13. VCI Warning for deleting old record

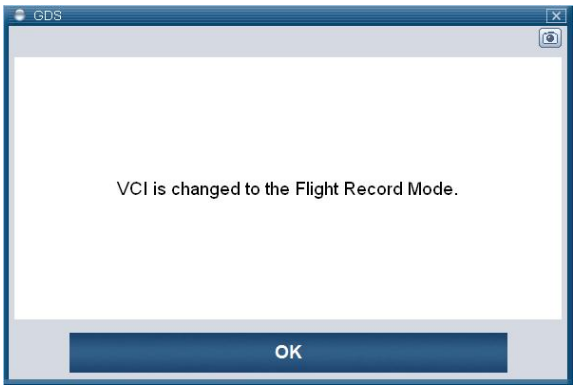


Figure 14. Completion of the mode change

Check VCI and Trigger module are in record mode. The VCI Power LED of will turn red, the Vehicle Communication LED will flash green. The Trigger module Power and Ready LED's will be on steady in the record mode.

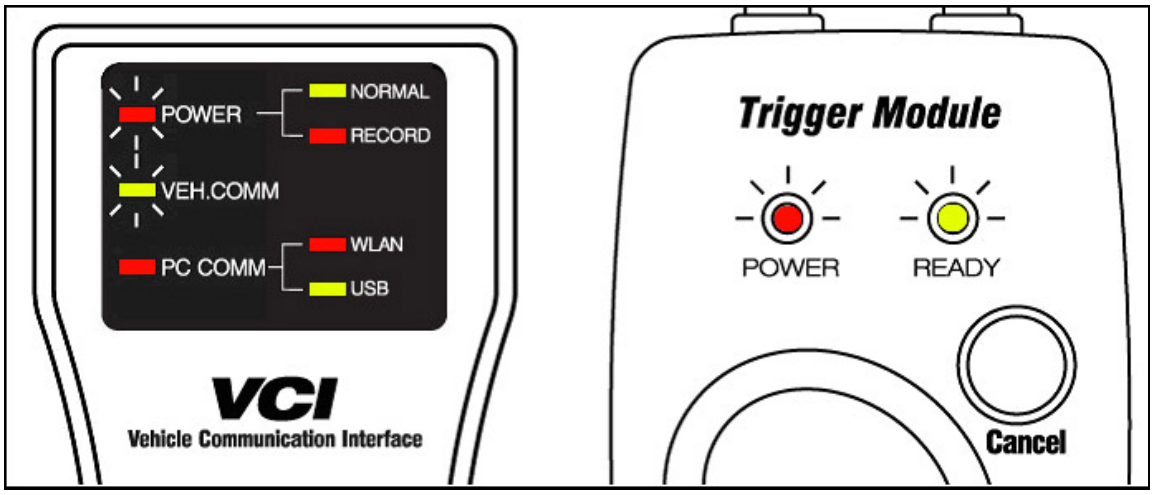


Figure 15. VCI Flight Record Mode

By pressing "Enter" button during the flight record process the VCI stops collecting data and starts saving the data the "Ready" Led will flicker for 10 seconds indicating the data is being saved in the VCI.

To exit the VCI Record mode, select the 'DTC Analysis' or 'Data Analysis' from the main menu. A popup window will appear as below.

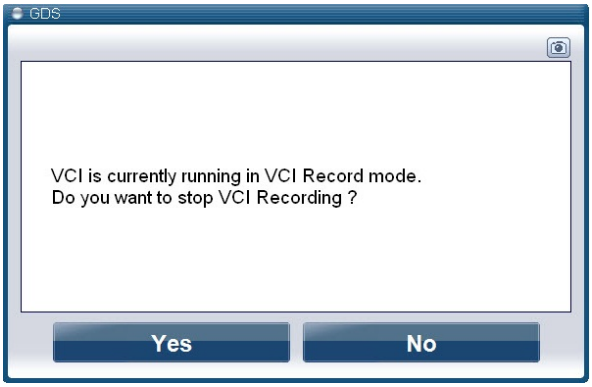


Figure 16. Confirm VCI Record OFF

When Flight Record mode is released, the VCI Power LED will change from red to green. This indicates that VCI has changed to Normal mode.

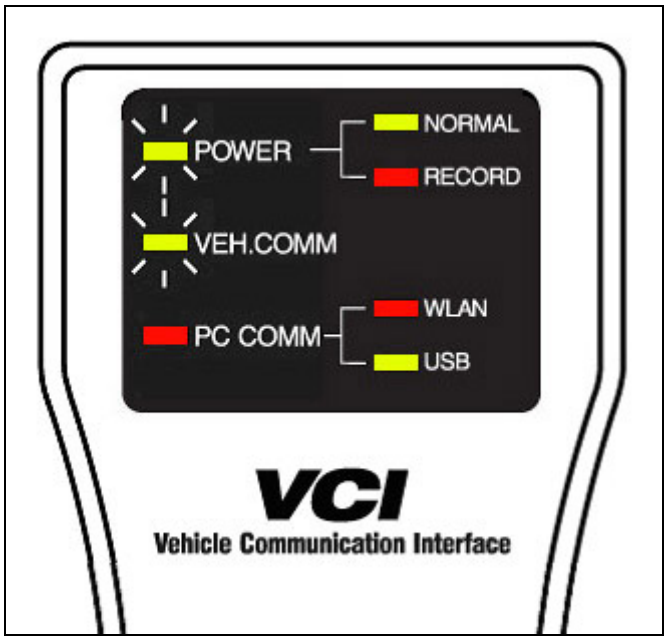


Figure 17. VCI Normal Mode

Data Copy From VCI

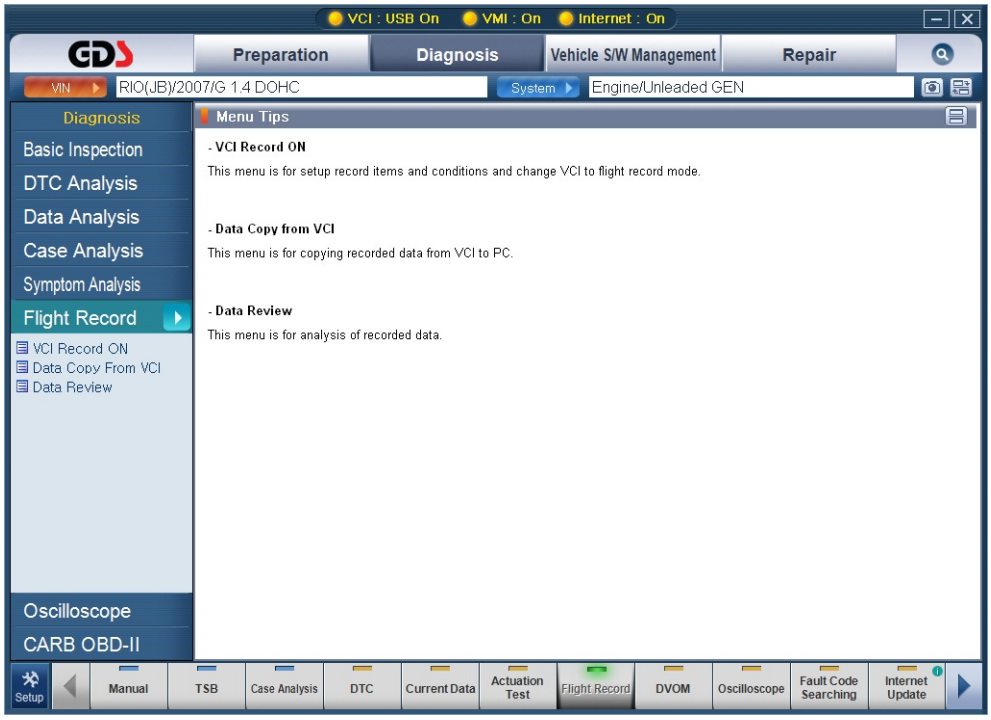


Figure 18. Flight Record Review Initial Page

Data Copy from VCI

This menu is for copying recorded/saved data from VCI to PC.
Select the needed data from the recorded data file on the left section of the screen and press the "Start Copy" button. Selected data will be copied and reprocessed in order.

If an "Error" message appears, it means that the data is incomplete.

The name of the data file is saved in a format of 'Vehicle name (Project Name) _yy/mm/dd-hour min sec. REC'.

If the data file copy is successfully completed, a window will open displaying completion of data copy. Data files that are copied will be shown on the right.

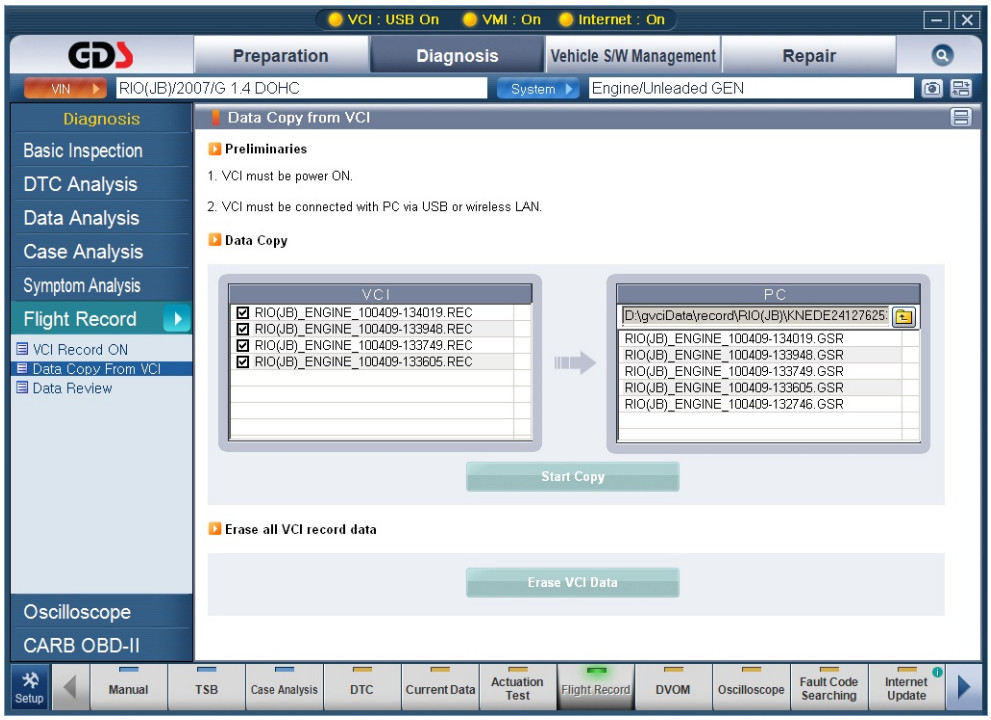


Figure 19. Data Copy from VCI

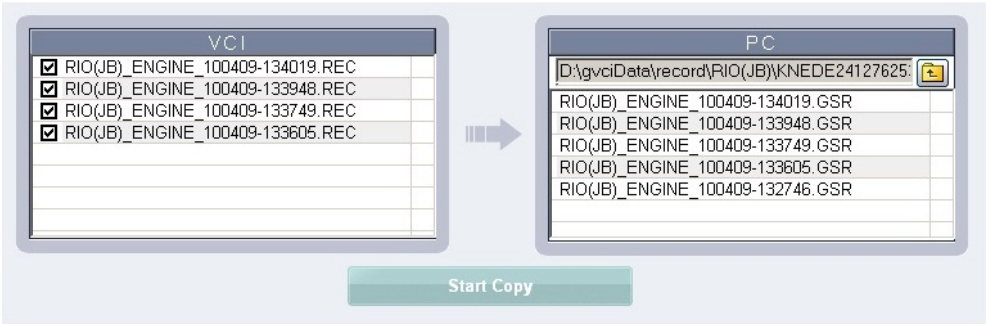


Figure 20. PC connecting to VCI

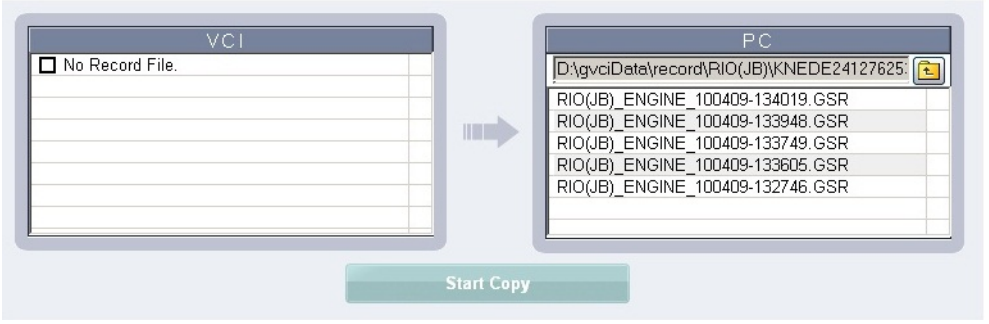


Figure 21. No Record File in VCI

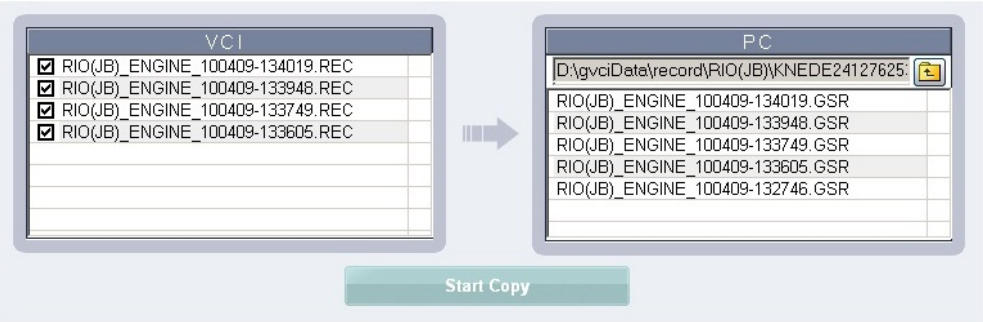


Figure 22. Copy the Record File from VCI to PC

Figure 23. Copying Record File from VCI Progress window

Figure 24. Complete the Data Copy from VCI

Figure 25. Erase VCI Data

"Erase VCI Data" button is used to deleting data in the VCI module.

Figure 26. Erase VCI Data Complete

Data Review

This menu is for analysis of recorded data. Press 'Data Review' button to analyze new or previously saved data. With the 'Data Review' window opened, it will ask you to select a record file. Highlight the file to displayed and Open the file. Select the data on the right of the screen to display. Maximum number of items that can be displayed on the screen as a graph is 8.

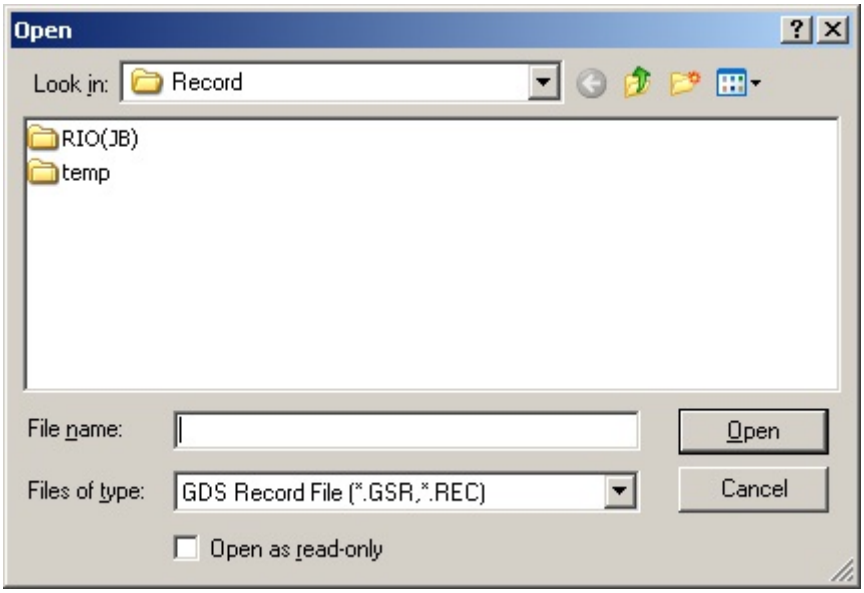


Figure 27. Data Open Window

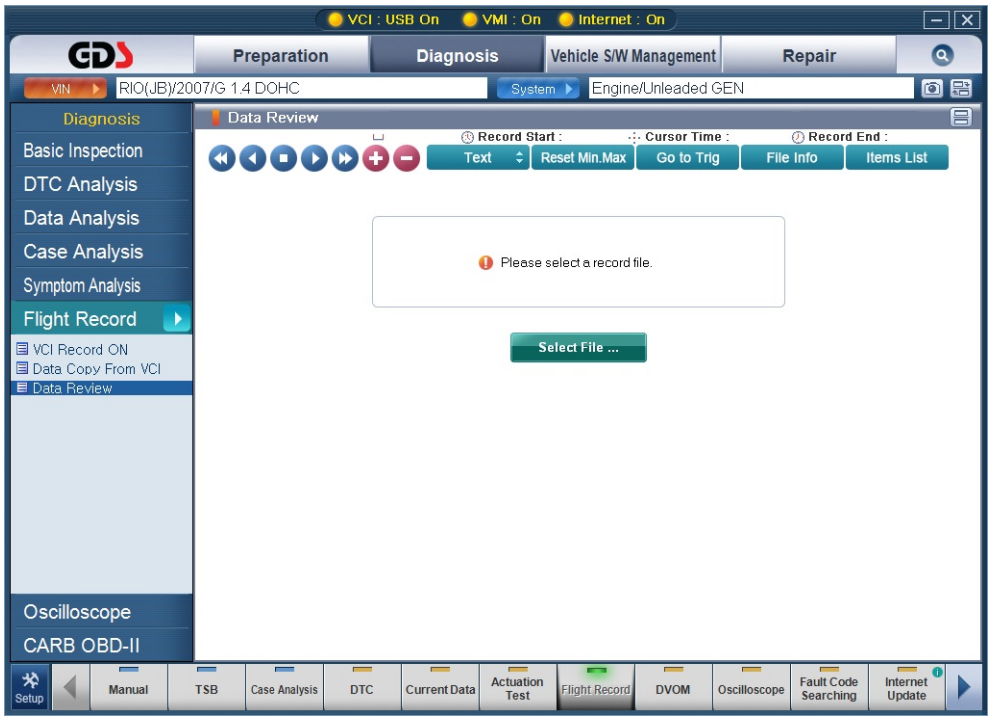


Figure 28. Data Review Initial Window

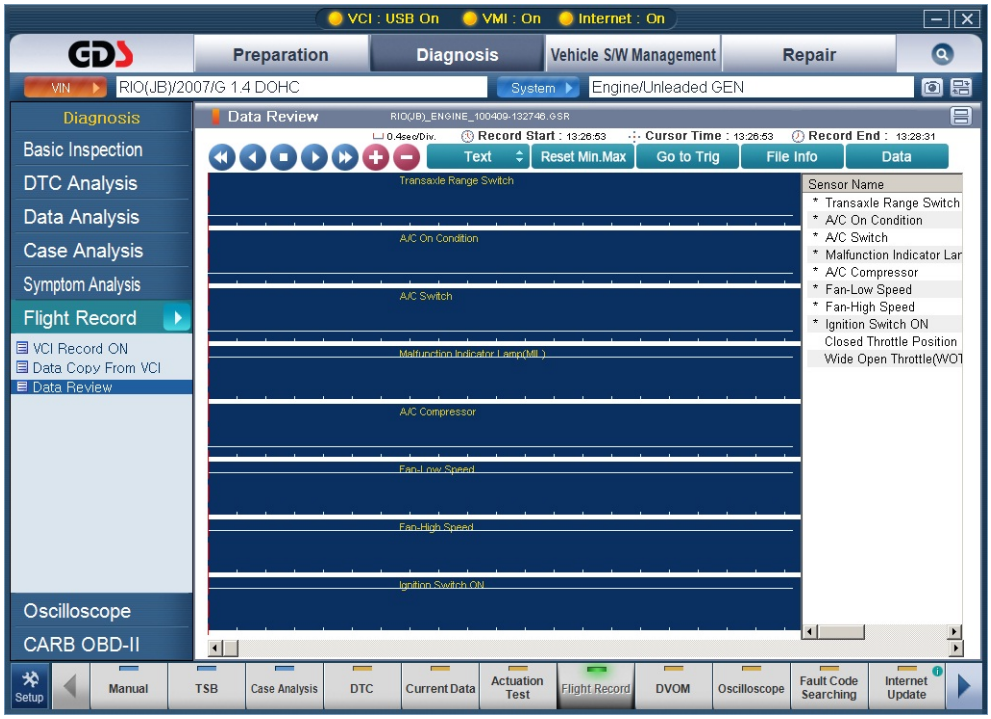


Figure 29. Data shown in graph (Items)

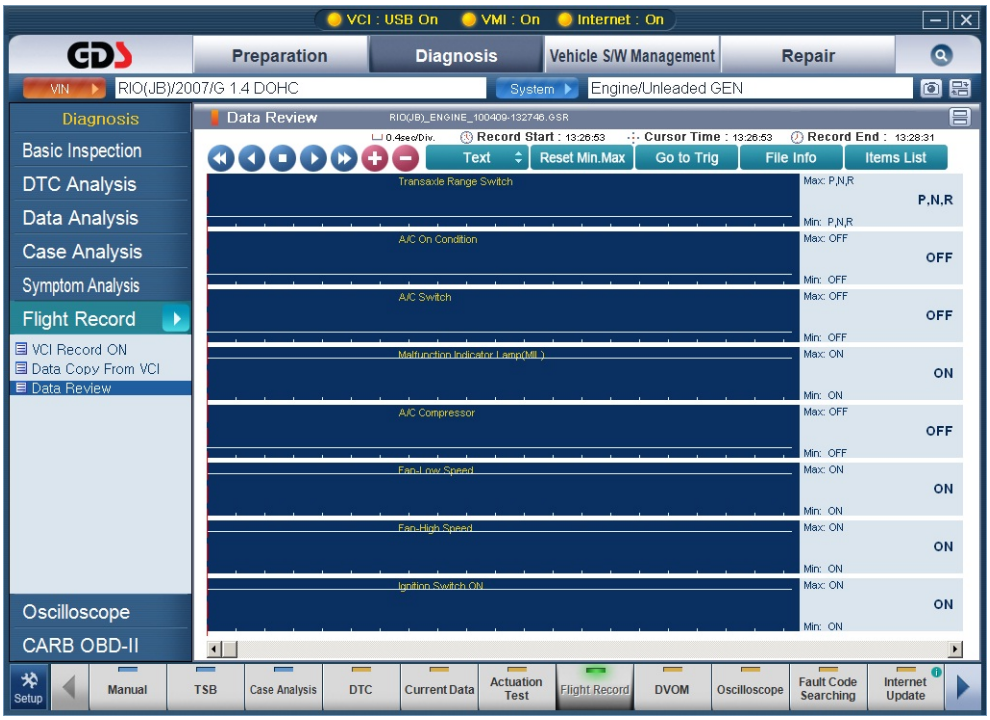


Figure 30. Data shown in graph (Value)

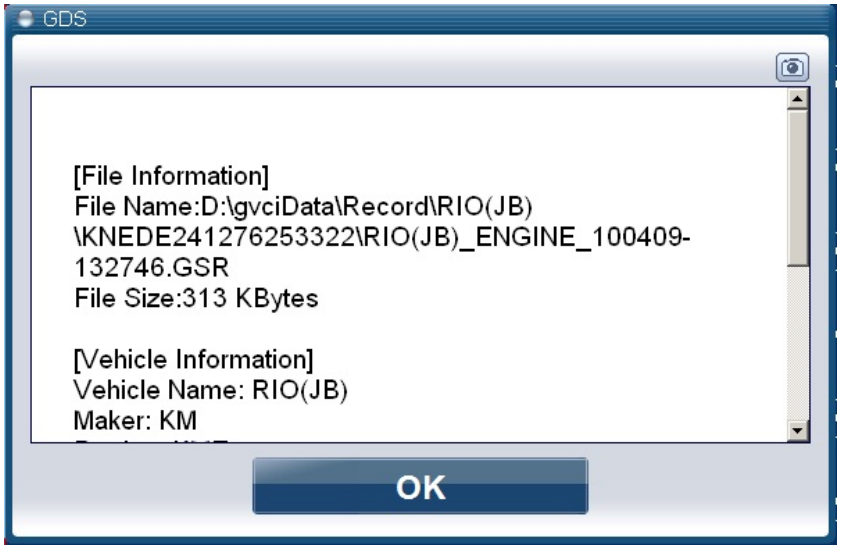


Figure 31. File Information Window

Icon	Description
	Used for loading saved data
	Used to move graph to the left or to the right
	Use to magnifies and abridges the data in Graph mode.
	Use to change the turn of phrase to 'Text'. It toggles with 'Graph'.
	Use to change the turn of phrase to 'Graph'. It toggles with 'Text'.
	Reset the Maximum, minimum of item value.
	Move to the position that fault code is appeared or move to the position when the enter button of the trigger module is pressed.
	Shows data information of the loaded record file.
	Shows item list of the data
	Show the time per division.
	Shows the time that the record was started
	Shows the trigger starting time
	Shows the time that the record was ended

CARB OBD Ⅱ

GDS – Diagnosis **Module: A–04-007 (p.01)**

CARB OBD Ⅱ mode is used to display generic vehicle powertrain diagnostic data. The vehicle communication protocol is automatically determined when CARB OBD II mode is selected.

Readiness Test

The type and result of the READINESS TESTS supported by more than one MODULE within the vehicle will be displayed. The number of DTCs present and the MIL status will also be displayed.

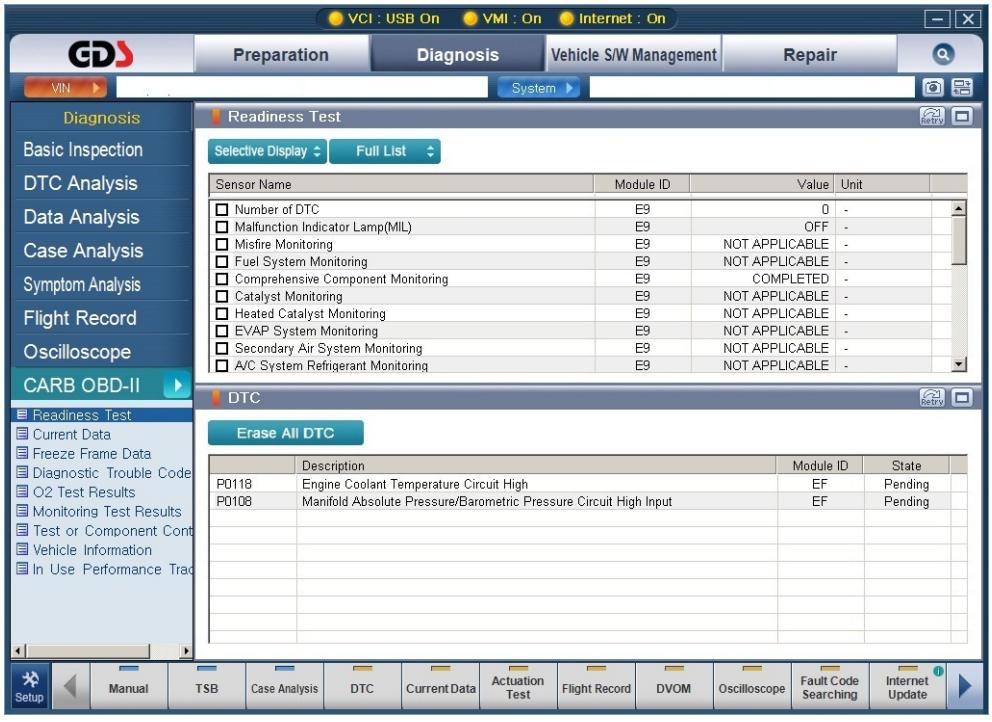


Figure 1. Readiness Test

Current Data

The CURRENT DATA MODE allows for sensor values and switch states to be displayed, based upon the concept that one item may be supported by several modules. Supporting module information is displayed in this mode.

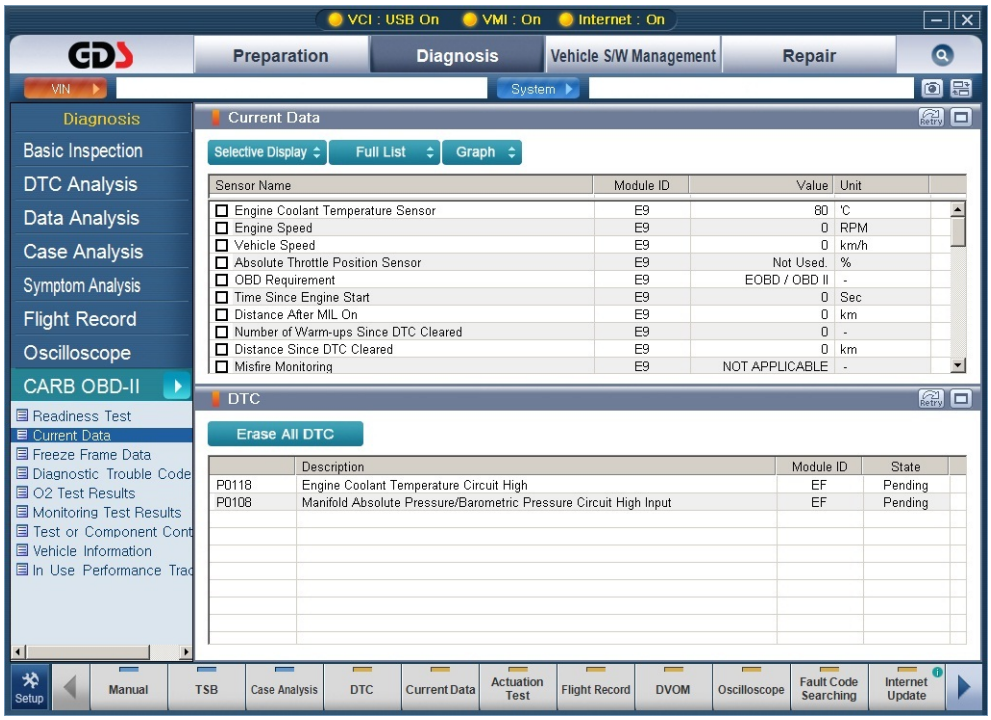


Figure 2. Current Data

Freeze Frame Data

The FREEZE FRAME DATA displays the data values stored in the Engine Control Module at the point when the first conformed DTC is detected.

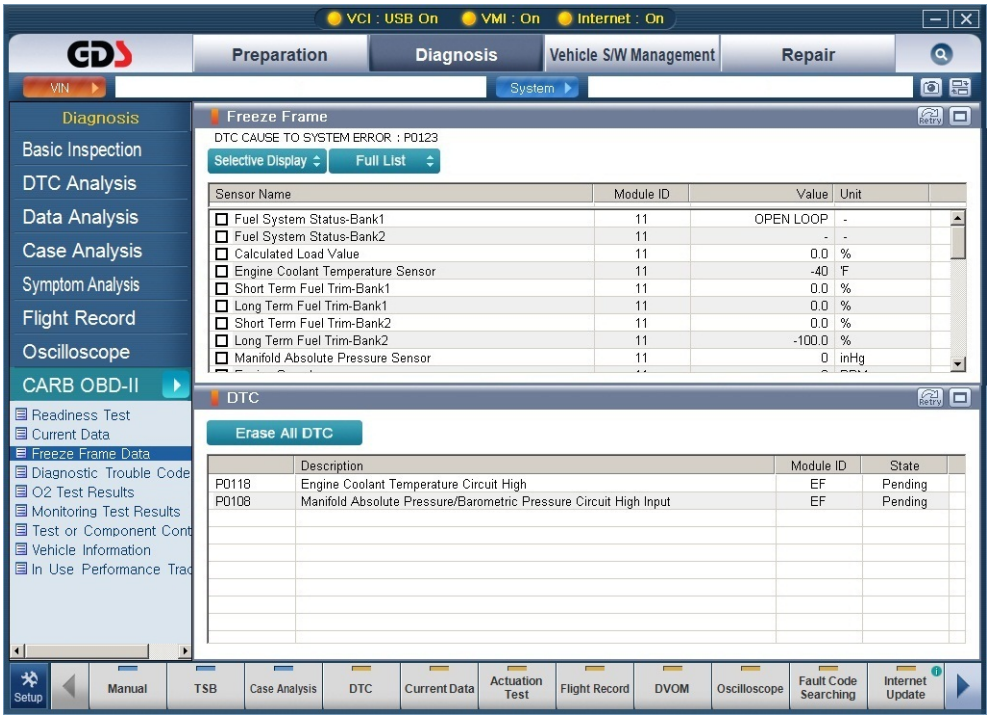


Figure 3. Freeze Frame Data

Diagnostic Trouble Code

At this level, DIAGNOSTIC TROUBLE CODES (DTC) are Displayed based upon the concept that several modules may support one DTC. Supporting module information is displayed in this mode.

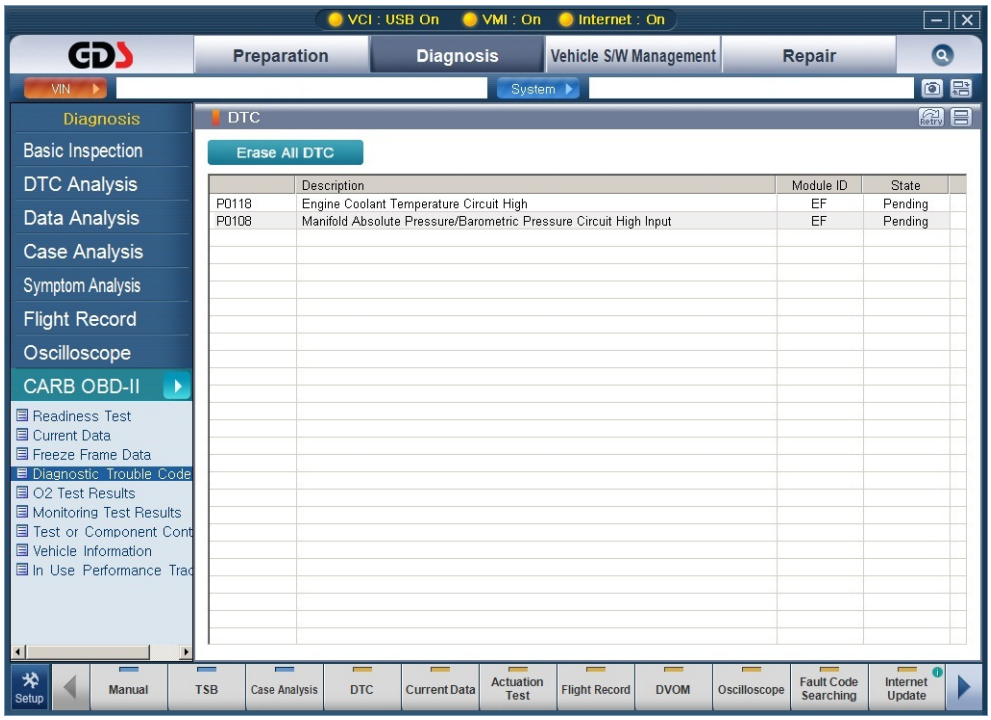


Figure 4. Diagnostic Trouble Code

O2 Test Result

The results of the on board oxygen sensor monitoring test can be displayed in this mode. Note that only items related to the oxygen sensor will be displayed.

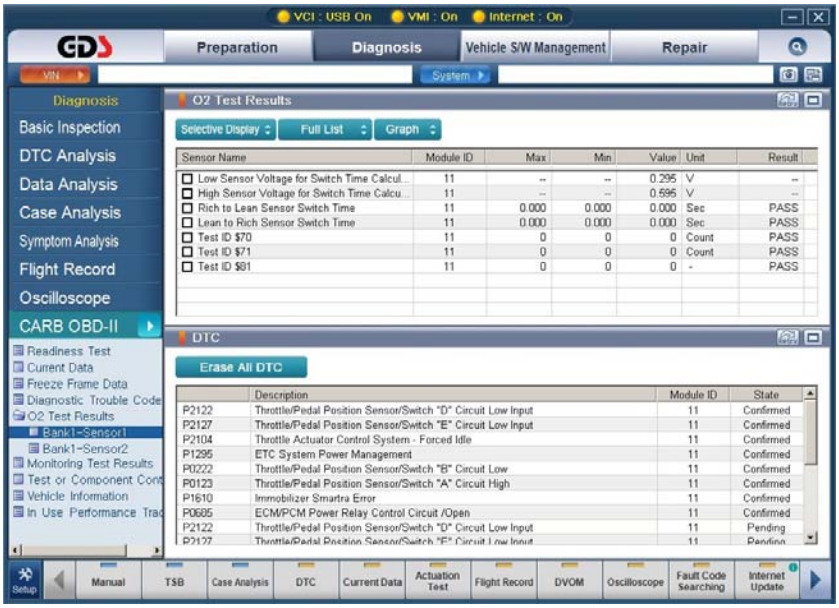


Figure 5. O2 Test Result (B1/S1)

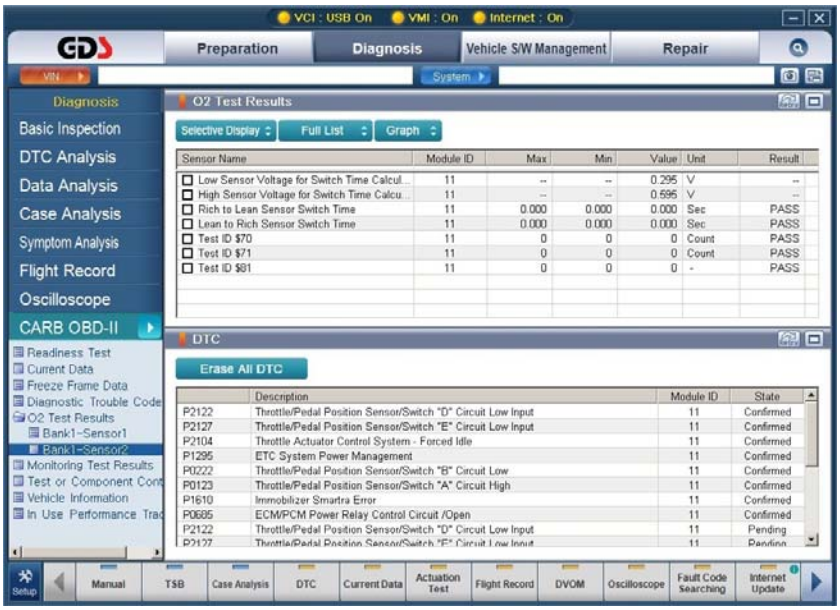


Figure 6. O2 Test Result (B1/S2)

Monitoring Test Result

The results of on board monitoring tests conducted during normal driving are displayed this mode.

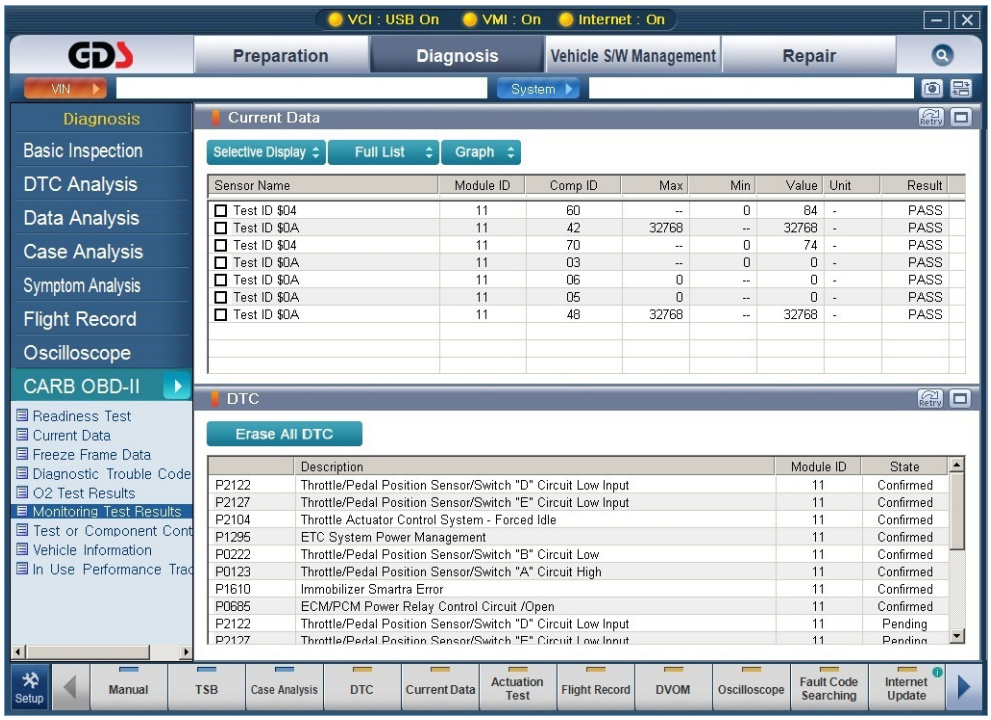


Figure 7. Monitoring Test Result

Test or Component Control

Figure 8. Test or Component Control

Vehicle Information

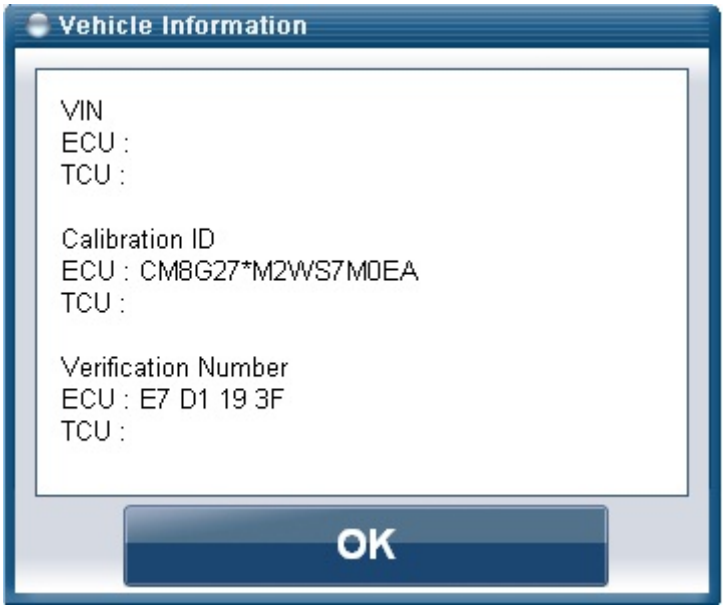


Figure 9. Vehicle Information

In-USE Performance Tracking

This data is used to support possible regulatory requirements for In-use Performance Tracking. Manufacturers are required to implement software algorithms that track in-use performance for each of the flowing component:

- Catalyst bank 1
- Catalyst bank 2
- Primary oxygen sensor bank 1
- Primary oxygen sensor bank 2
- Evaporative 0.020" leak detecting system
- EGR system
- Secondary air system

The numerator for each component or system shall track the number of time that all conditions necessary for a specific monitor to detect a malfunction have been encountered. The denominator for each component or system shall track the number of times that the vehicle has been operated in the specified conditions. These conditions are specified for each monitored component or system.

The ignition counter shall track the number of times that the engine has been started. All data items of the In-use Performance Tracking record have to be reported in the order as shown.

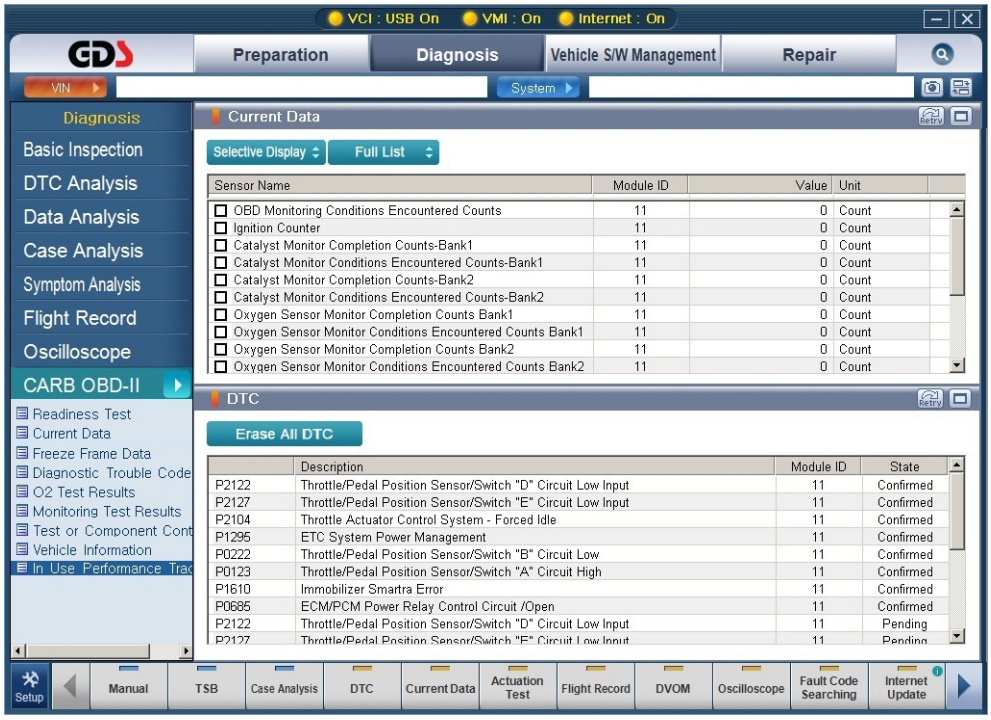


Figure 10. In-Use Performance Track

Actuation test

Selection of Actuation Test Item

The "Actuation Test" mode allows supported outputs to be activated by the user to verify proper ECU and component operation.

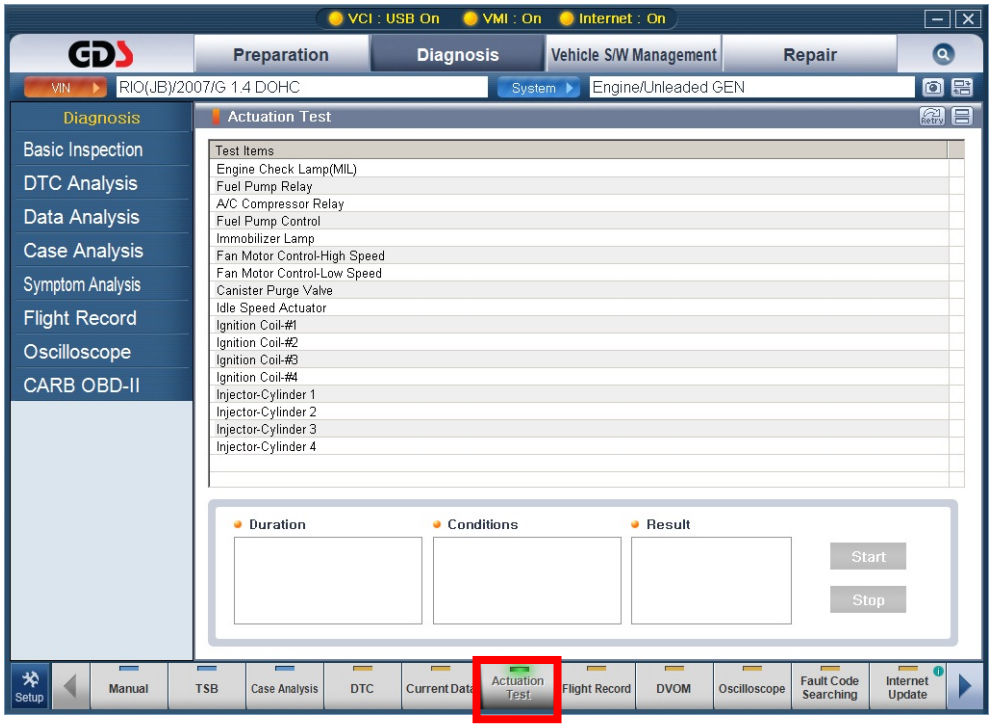


Figure 1. Selection of Test Item

Preparation of Actuation Test

Each supported actuator test will have specific test duration and ignition key conditions.

Click the "Start" button after selecting the desired test. Note that some tests will continue until the "Stop" button is clicked."

Results (variable based on ECU) may be viewed in the "Result" field, by audible or visible output, by viewing the appropriate data parameter, or by a combination of the previously listed methods.

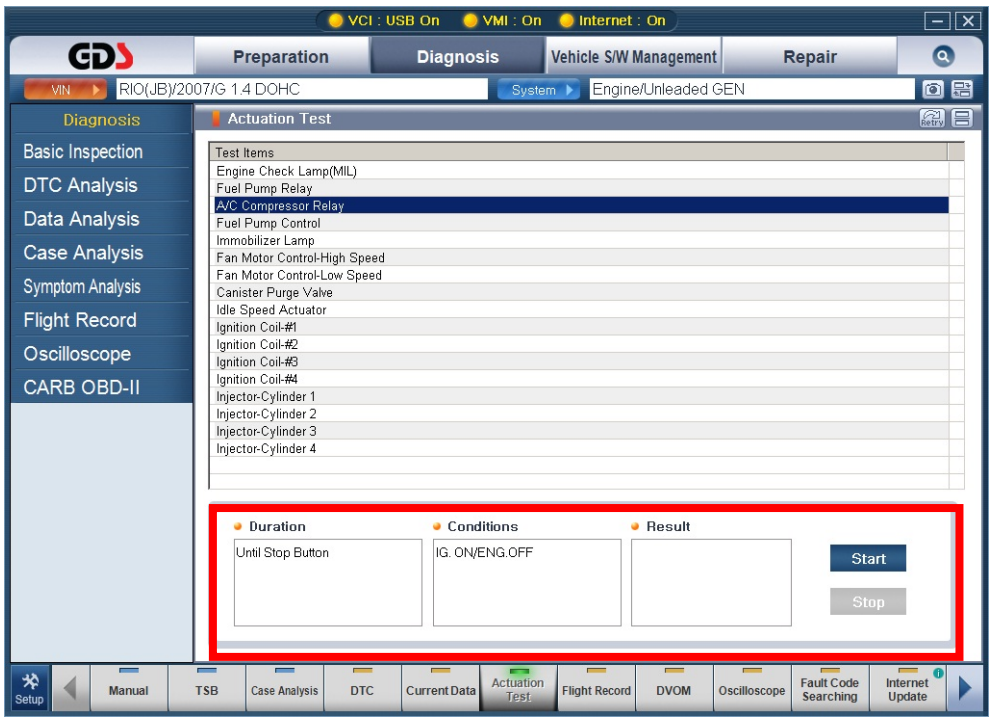


Figure 2. Operation of Actuation Test

Duration

Duration represent a time period that Actuator tests after the "Start" button is clicked. Duration can be different for each Actuator items.

Condition

"Condition" represents conditions for actuators to test normally. Configure vehicle setting under the actuation condition before the test. The Conditions can be different for each control module and actuator item.