

Brake tests with CAN wheel speed data

Introduction

The objective of this test is to perform brake tests to examine trigger to 0Kph and 100 to 0Kph data using the Report Generator software. In this example, wheel speed information is also recorded from the vehicle CAN Bus.

Equipment used

- 1 x VBOXIII
- 1 x RLVBCAB019 5way Lemo to 9 way D-sub
- 1 x Cigar lighter adapter, RLVBCAB10
- 1 x GPS Magnetic Aerial, RLVBACS001
- 1 x Brake pedal trigger, RLVBACS004
- 1 x 32Mb Compact Flash Card, RLVBACS005.
- 1 x PC running latest VBOX software and Report Generator

Setup Procedure

Place the magnetic GPS Aerial on the roof of the test vehicle and run the cable into the vehicle through the door seal. Connect the aerial cable to the VBOXIII, ensuring the connection is free from dirt. Connect power to the VBOXIII using the cigar lighter adapter or a battery pack.

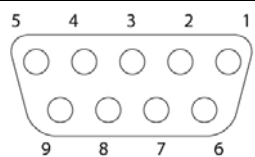
Insert an empty compact flash card into the compact flash card slot in the VBOXIII.

The brake trigger should be connected to the digital input socket and fixed to the brake pedal using a cable tie or elastic band.

For the test, the VBOX should be left until the green 'ST' light on the VBOX indicates that at least 6 satellites are in lock.

The CAB019 cable is used to connect the vehicle CAN bus to the VBOXIII. In this example the vehicle is already fitted with a CAN bus connection. Contact Racelogic for information on locating CAN bus in other vehicles. CAN Bus Connections for the CAB019 cable are as follows.

9 way Sub D Female	Signal	Description
2	CAN_L	CAN bus line, low
7	CAN_H	CAN bus line, high

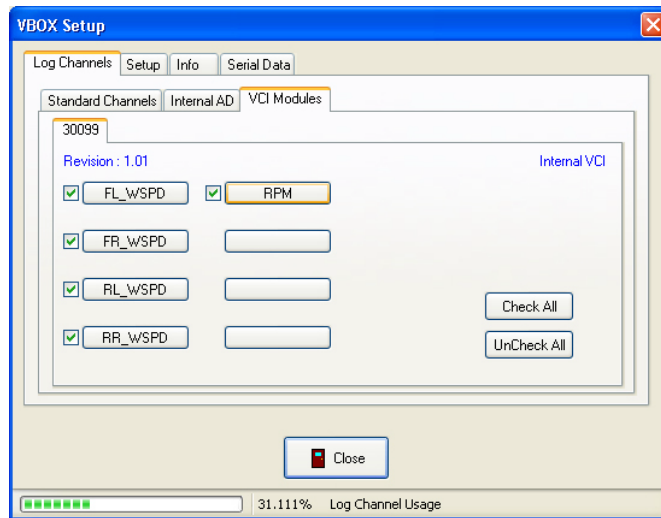


To configure the VBOX III to collect the required data from the CAN Bus, a Racelogic database file is used. Using this file, it is possible to select from a list, the parameters that are required for the test.

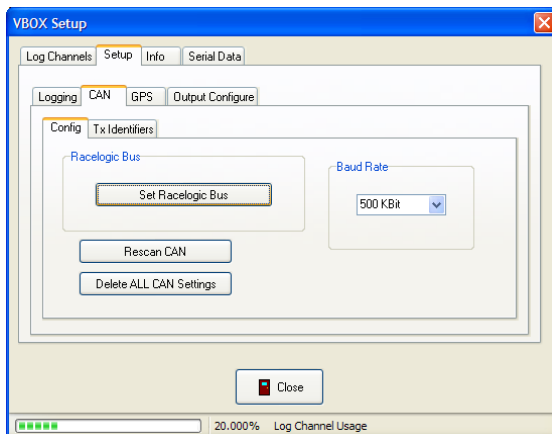
The procedure to configure a CAN Bus channel from a database file is as follows:-

- ⇒ Select VBOX Setup
- ⇒ Select Log Channels tab
- ⇒ Select VCI Modules tab
- ⇒ Click one of the VCI channel buttons to configure a channel
- ⇒ Select Load database file (.REF) to load and list the contents of the database
- ⇒ From the list, select the parameter for that channel.

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After the CAN channels are configured the VBOX III is set to allow logging of external CAN bus data on the connector marked "CAN". This is accomplished in the CAN tab of the Setup screen as shown below.



With the settings as shown below the following setup is in place
 "RS232" Connector = Racelogic external modules (using splitter box)
 "CAN" Connector = External CAN bus eg; Vehicle CAN bus defined by VCI settings



Test Procedure

With all the channels configured correctly the vehicle is ready to perform the test. For the test, the vehicle is driven in a straight line to approximately 65mph and then a braked hard until stopped.

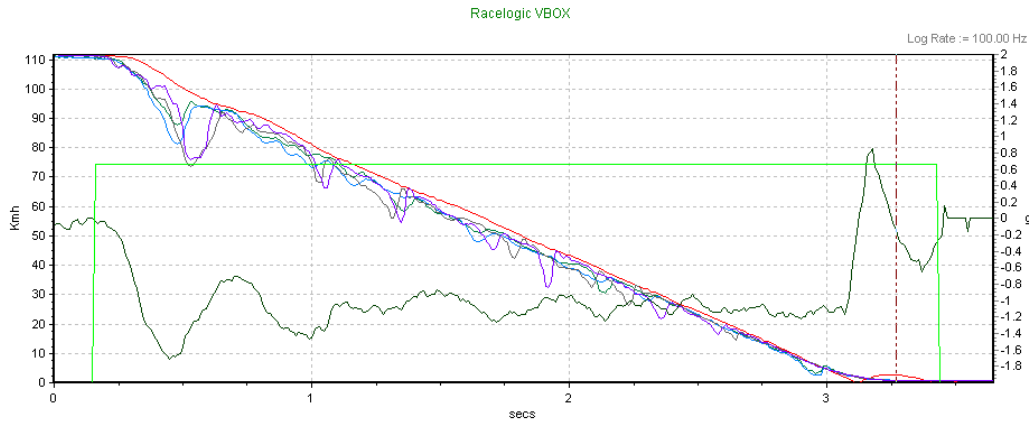
Remove the compact flash card from the VBOX and insert into the PCMCIA card reader in the Laptop.

Viewing the Data

In the VBOX software, load the VBOX file from the compact flash card. Click 'Graph' in order to view the data in a velocity versus time window. The graph data below shows expected test data. Notice also that the graph below shows longitudinal acceleration in black and the brake trigger in green.

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Graph

The graph is a chart export from the graph window of VBOX software showing the brake stop from the logged data.



In the graph window the locking up of the wheels can be seen by the dips in the wheels speeds. This is also reflected in the reduction of the deceleration g after the wheels slip.

Producing a table of results

Using the Report Generator software load the log file using the 'Load' option from the drop down 'File' menu.

The column heads are then set to the following: **Run Num**, **Time**, **Dist**, **Time(Delta)**, **Dist (Delta)**, **Speed**, **LongACC(g)** - average between test lines, **MFDD (g)**, **Corrected distance** and **Description**.

Open the test setup page. In the options page set the units to **KPH**, **meters** and **g**. The 'continuous testing' and 'hide test resets on over/under speed' options should also be enabled.

Other settings are:-

The MFDD start and end percentages set to 80 and 10%.

Corrected distance enabled for calculation from the nearest 10 km/h.

Brake trigger selected in start conditions. Option 'either' selected.

End Conditions, speed set to 0. Option 'either' selected.

In the Line conditions, value under 'Additional lines will be added at the following speeds' should be set to 100 Kph.

Closed the Test Setup menu and click the 'Scan' button. The report generator will now scan the data file to produce a table of results.

Results / Conclusion

The screen shot below shows the results from the brake stops. The total brake stop distance and time is shown in columns 2 and 3. The time and distance from 100-0Kph is shown in columns 3 and 4, this is done by showing the delta values of time and distance. Long acc, MFDD and corrected distance have also been added to the table of results.

