

Store data on the USB-stick

First time Vibratool® stores data on the USB stick, data will be stored in a folder named '1'.

Second time data are stored in a folder named '2', etc.

Maximum numbers of folders are 99.

It is recommended to delete datafiles on the USB-stick after each session, to avoid mixing data from two different vehicles.



Read more about the USB stick on page 4.

The sensors are measuring G-forces, and therefore at least one of the axis will be influenced by gravity from the earth. During power-up Vibratool® compensates for this, and will not display this force in the bargraph. The influence of earth gravity is visible in stored data, and by that you can tell which axis is measuring the up/down movement in the vehicle.

Analyse data

Start the program and insert the USB stick with data, into a USB port on the PC. The program will automatically display data from the first data-folder on the USB stick. Typically folder '1'.

Functions:

Annotations for the Vibratool interface:

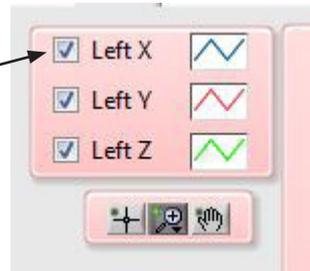
- Display data from 2 sensors in one frame
- Display data from 2 sensors in separate frames
- Spectrum analysis of frequencies, 2 sensors
- Display data from 4 sensors in separate frames
- Spectrum analysis of frequencies, 4 sensors
- Calculator
- Selects the first data folder on the USB stick by default
- Select another datafile
- Select filter
- Zoom reset
- Print screen
- Make a note before print
- Select Hub to be displayed

Scaling and display of the measurement result

Immediately the result may look confusing, or at worst incomprehensible. But with options to zoom in and out, and suppressing the display of one or more axes, the result will be useful and can thus help in troubleshooting.

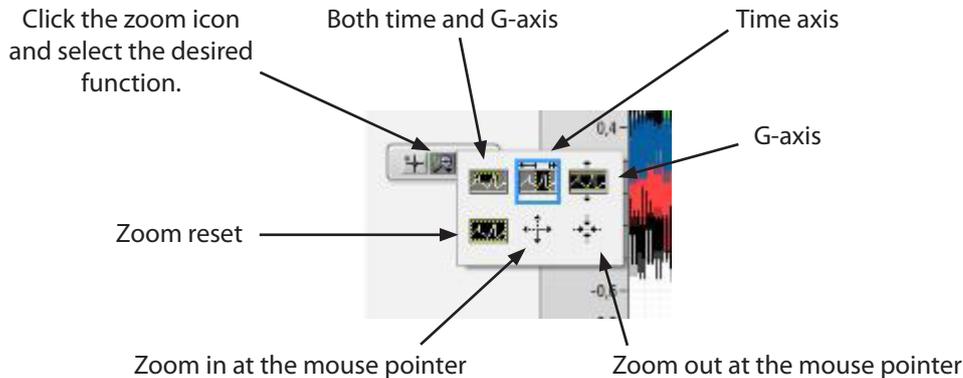
Turn each axis on or off

Click on the little white square, to set or remove the tick.



Zoom functions

First select a zoom function, then select the desired area of the image. Hold down the left mouse button, delimit the desired area and release the button.

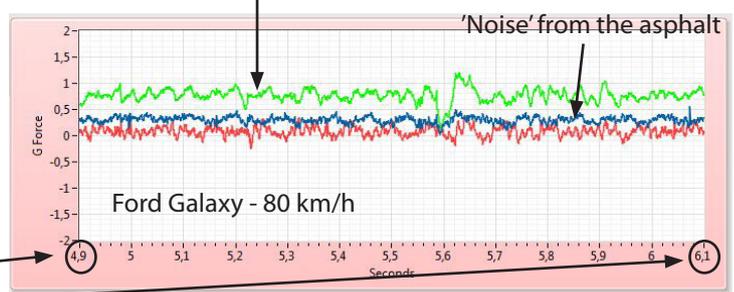


Display in the Split 1 window

Measured data come from a Ford Galaxy with vibrations in the steering wheel around 80 km/h. The sensors were placed on the two front supporting arms, as close to the wheels as possible

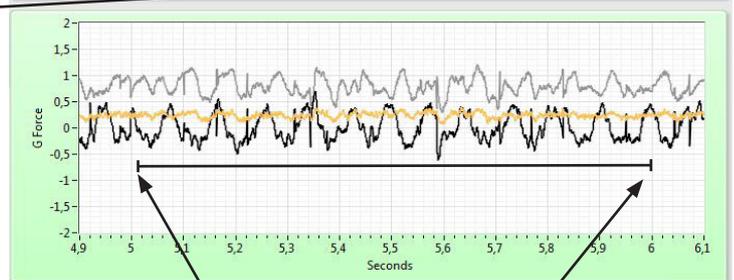
The time axis is zoomed in to about 1 sec. If a specific period of time is needed, double-click the start value and type in e.g. 5 and then the end value and type in e.g. 6

Z-axis is lifted from the two other axes, due to earth's gravity



It is clearly seen that the cause must be found to the right.

The vibration frequency can be read to about 14 cycles per second (14Hz), which fits with the wheels revolutions per second at 80 km/h.

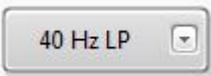


Approximately 14 cycles per second

Use of frequency filters

The data shown are the same as shown in

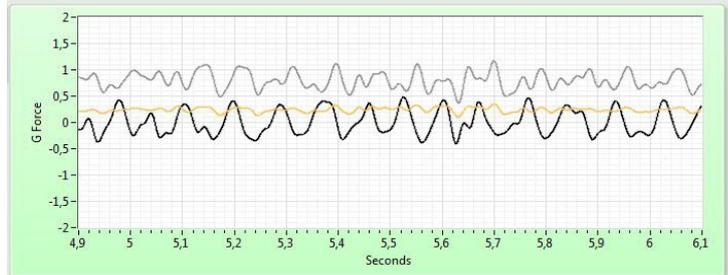
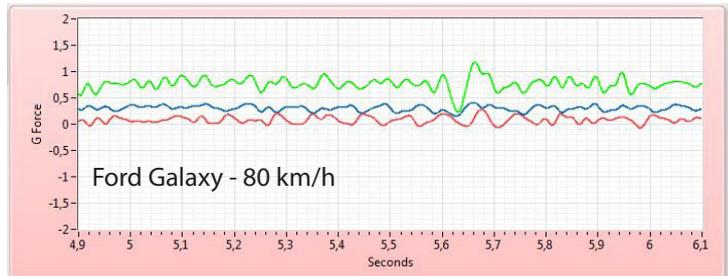
Display in the Split window, only is the filter '40 Hz LP' activated.



LP means low-pass, which means that the filter filters out frequencies above 40Hz.

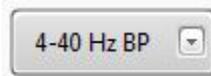
It therefore removes 'noise' from among other engine, gearbox and road surface.

This highlights the vibrations that are related to the wheels revolutions per seconds .



The data shown are the same as shown in

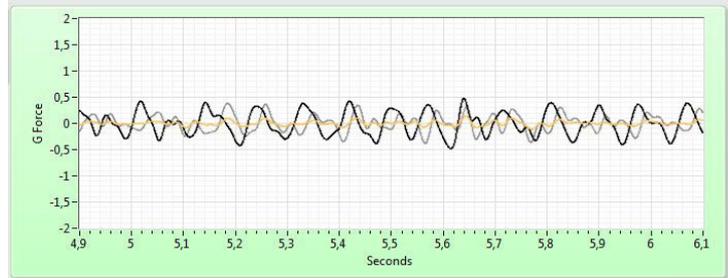
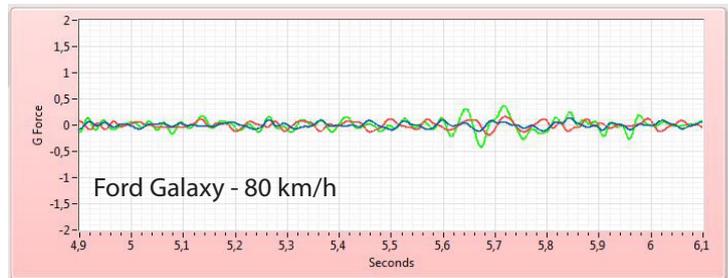
Display in the Split window, only is the filter '4-40 Hz BP' activated



BP means bandpass, which means that the filter allows frequencies between 4Hz and 40Hz. Lower and higher frequencies removed.

The main difference from the '40 Hz LP' filter is that this filter removes the influence of the earth's gravity , so all axes is around zero G.

Still no question of the fault to be found in the right side.



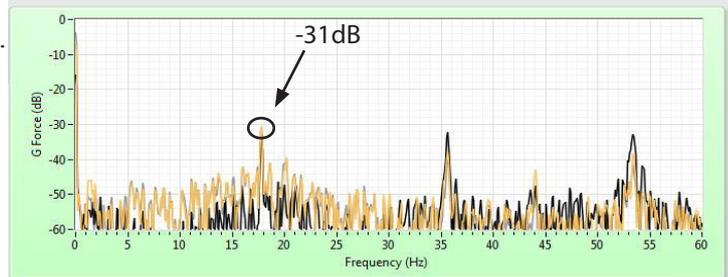
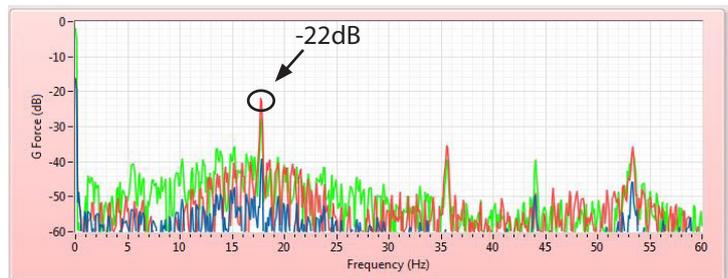
Using Spectrum Analysis

Spectrum analysis is used to see which frequencies are measured and how powerful they are each. Here one needs to know the wheel revolutions per second , at the particular speed.

This measurement is from a BMW 530D where the wheels where rotating at 18 rev/sec . (18Hz)

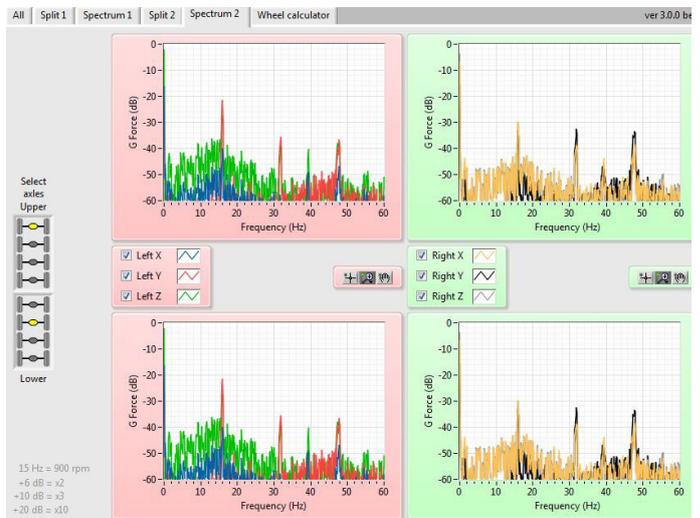
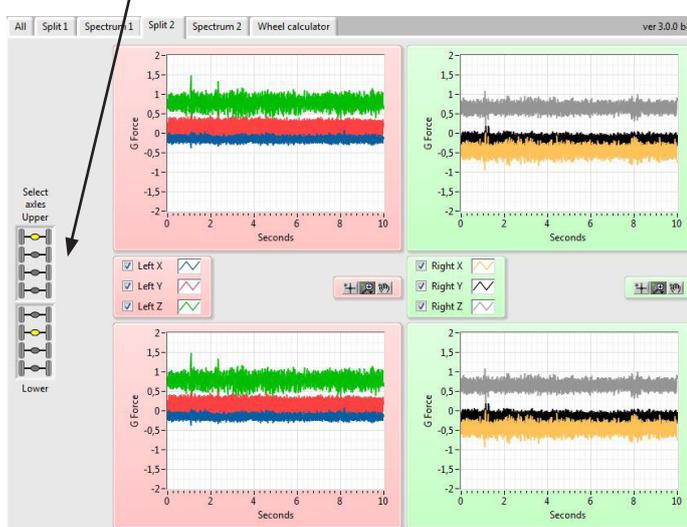
dB scale is logarithmic and goes from 0dB to -60dB. 6dB = x2, 10dB = x3, 20dB = x10 0dB corresponds to a force of 2G.

The measured difference of 9 dB , corresponding to the vibration of the left-hand side is almost 3 times stronger than on the right.



Compare data from 2 different Hubs

Use the tabs "Split 2" and "Spectrum 2" to compare data from two different Hubs. Select which Hubs to be compared.

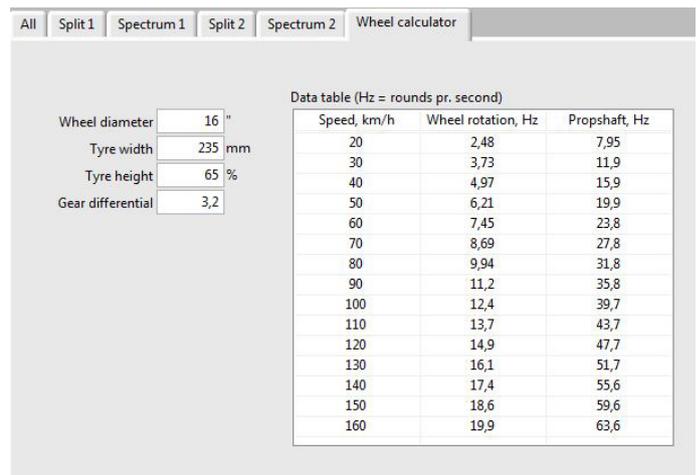


Wheel Calculator

Type in data from the tires, and if possible gear ratio of the differential.

Readout the wheels revolutions per seconds, at the actual speed of the vehicle.

Vibrations per second is measured in Hertz (Hz).



USB stick

The USB key contains in addition to the PC program, installation and user guides, a file named *SETUP.txt*

The file contains a number that determines how many seconds each data collection stores to the USB stick. Max. value is 50, corresponding to 50 seconds. If the file is missing, 10sec. will be stored as default. We recommend 5 seconds.

Change the value using *notepad.exe*

Any USB stick can be used, but they must be formatted to FAT32/512 byte and named VIBRATOOL

The PC software only recognize the name 'VIBRATOOL'.

