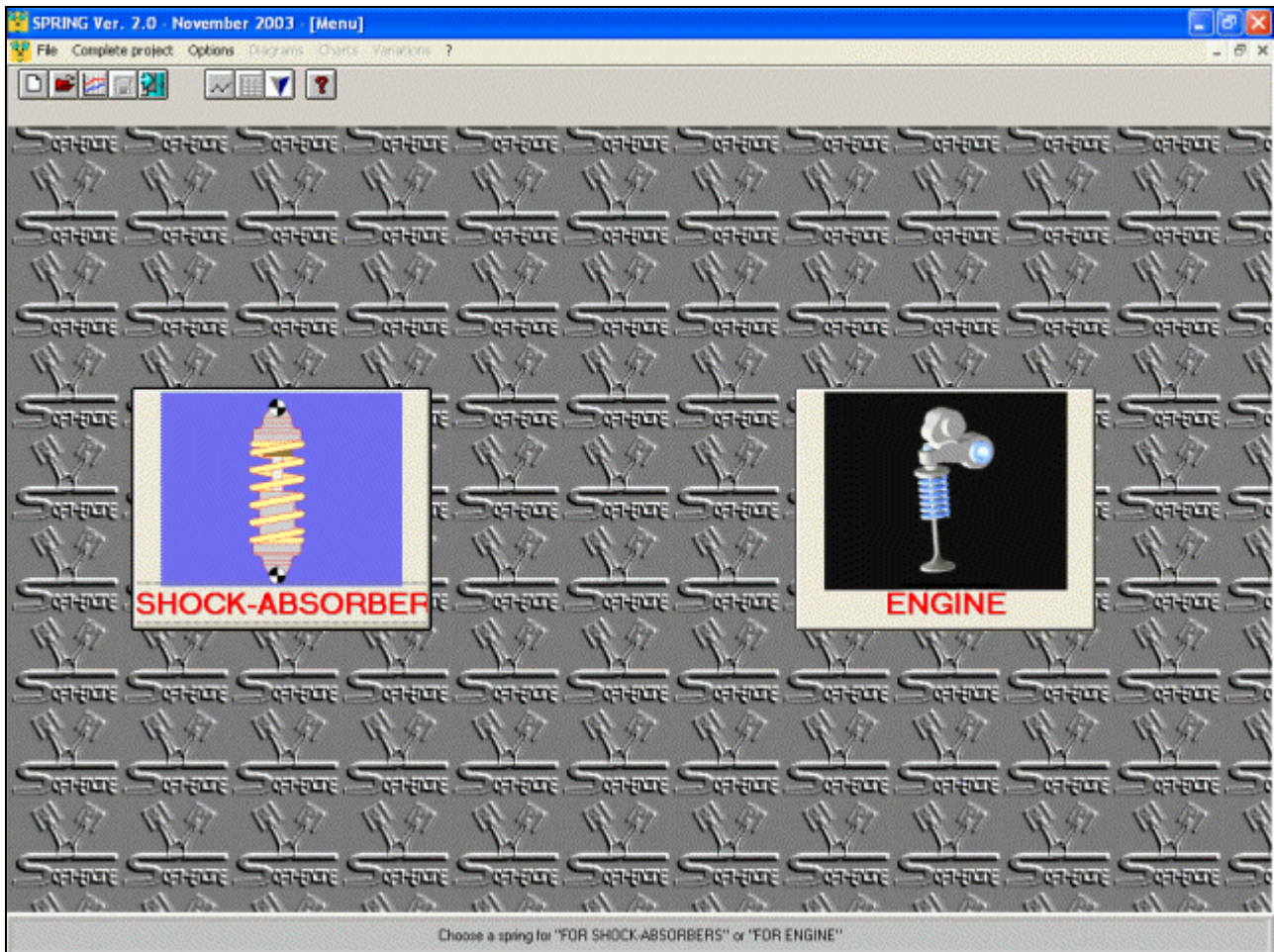


Soft-Engine - Software Spring 2.0

Main features

SPRING 2.0 is a very professional **software** by **Soft-Engine**, WINDOWS® environment, having a friendly graphic interface.

This software is about the project and analysis both **shock-absorbers** and **valves springs**. Obviously, for valve springs it's possible to choice **single spring** or **double spring** computing.



The main window

Data input

Typically, software data input are:

- ☞ **Free spring lenght**
 - ☞ **Max. compression force**
 - ☞ **Pre-loaded spring froce** (shock-absorber)
 - ☞ **Stress** (closed valve, for engine valves)
 - ☞ **Stress** (of work material, for shock-absorbers).
-

Shock-absorber spring data input

Initial mean diameter / wire diameter spring ratio : 7.272

Preload spring length [mm]: 250.0

Spring outside diameter [mm]: 80.0

Spring max. compression [mm]: 100.0

BASIC DATA

FORCES AND STRESSES DATA INPUT

Max. force at max. compression [N]:	3000.0
Preload force [N]:	800.0
Mean spring stiffness [N/mm]:	22.0
Material working max. stress [N/mm²]:	700.0

OK Close

Data input window (shock-absorbers spring)

Ellicoidal double spring data input

External spring outside diameter [mm]: 33.0

Outside spring length at closed valve [mm]: 40.0

Inside spring length at closed valve [mm]: 39.0

Initial mean diameter/wire diameter spring ratio : 6.33

Outside/inside spring distance ratio : 0.929

Valve max. lift [mm]: 3.0

Max. engine RPM [RPM]: 3000

BASIC DATA

FORCES AND STRESSES DATA INPUT DOUBLE SPRING

Max. total force at opened valve [N]	1109.0
MMin. outside spring force at closed valve [N]	265.0
Outside spring material working max. stress [N/mm²]	700.0

FORCES AND STRESSES DATA INPUT INSIDE SPRING

Inside/Outside spring force distribution ratio	0.717
Min. force inside spring at closed valve [N]	98.0
Inside spring material working max. stress [N/mm²]	710.0

OK Close

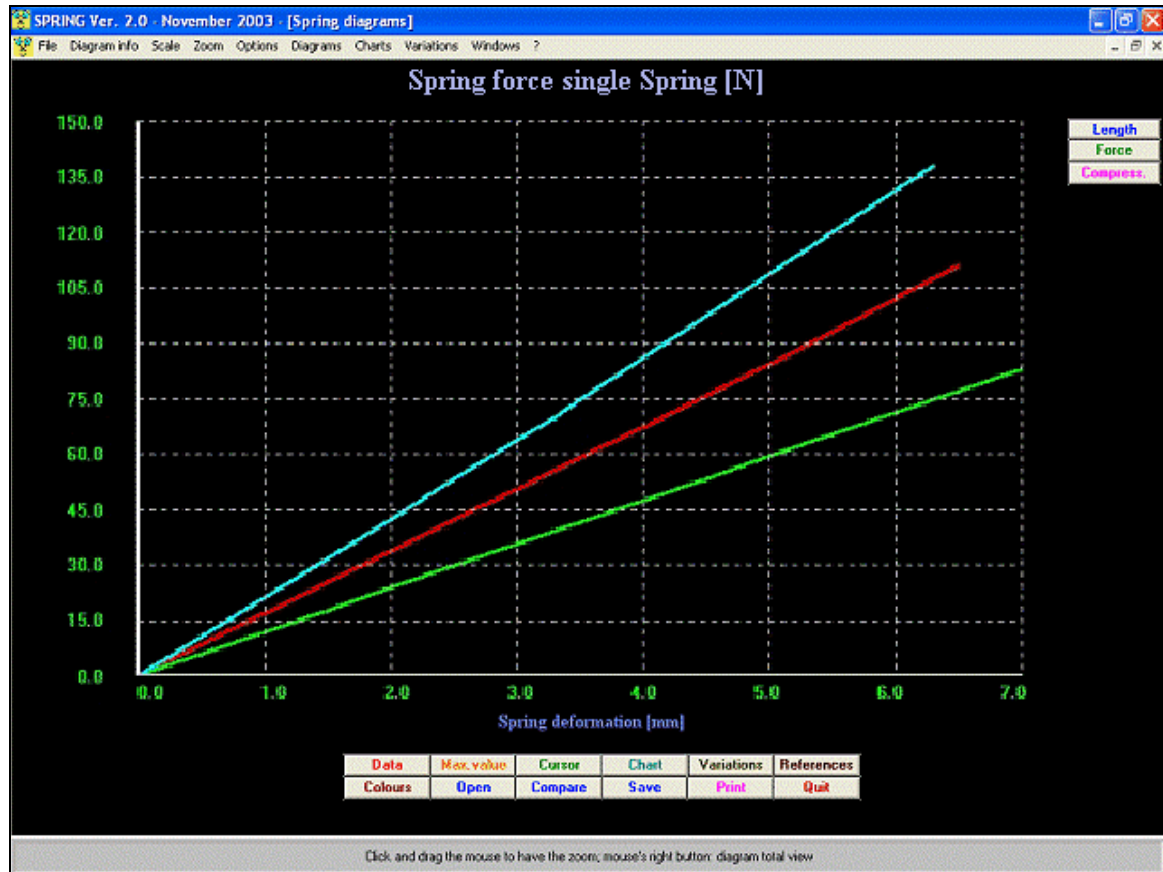
Data input window (engine spring)

Results

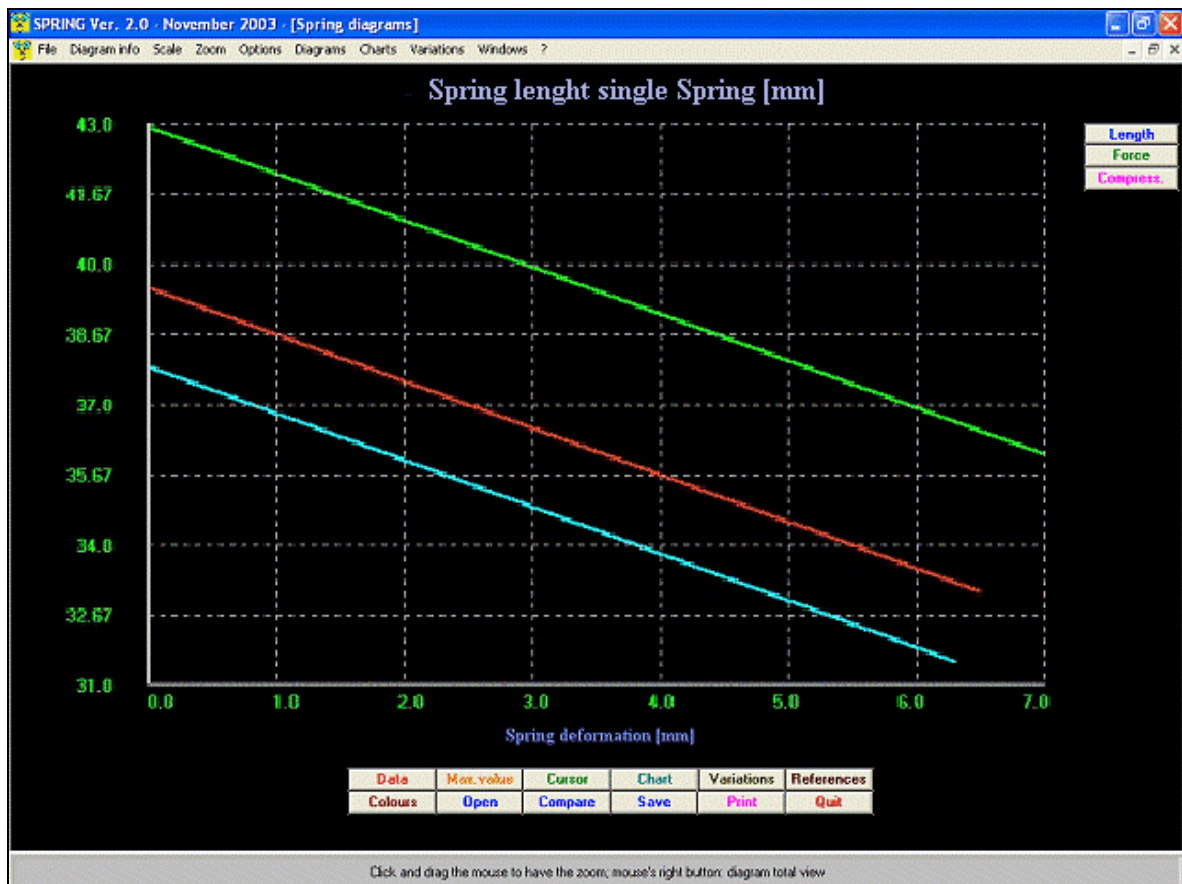
Software give some diagrams and charts about these results:

- ☞ Spring lenght
- ☞ Spring force
- ☞ Valve lift (for engine springs)
- ☞ Spring compression (For shock absorbers).

Soft-Engine engine simulation software – software “Spring”



Single spring force diagram



Single spring length diagram

Results analysis

Suitable query reports show some interest data, like **block forces and stresses**, **Whal factor**, **number of coils** or **harmonics of excitation**. You can vary input data in these query reports to study how projected spring change its features (option: variations). The input data modifications can be saved in another "data configuration", so you can compare the results about different swet of data, corresponding to different springs.

SPRING 2.0 has got a powerful form for diagram visualization. Options are:

☞ **diagram cursor** to read all diagram value step by step;

☞ **max values** visualization

☞ **zoom**

☞ **printings**

☞ all software options are available by this form

☞ diagram and backgrounds management

☞ X and Y axis management

Finally, this software allows a complete save-open file management, and a **link** with the most recent versions of software [SUSPENSION](#) and [CAMS](#).

Double spring results query chart

Configuration: Basic data

BASIC DATA	
Outside/Inside spring distance ratio:	0.929
Valve max. lift [mm]:	3.0
Max. engine RPM [RPM]:	3000
Max. total force at opened valve [N]:	1109.0
Inside/Outside spring force distribution ratio:	0.717

OUTSIDE SPRING	
External spring outside diameter [mm]:	33.0
Initial mean diameter/wire diameter spring ratio [mm]:	6.33
Outside spring length at closed valve [mm]:	40.0
MMin. outside spring force at closed valve:	265.0
Outside spring material working max. stress [N/mm²]:	700.0

INSIDE SPRING	
Inside spring length at closed valve [mm]:	39.0
Min. force inside spring at closed valve [N]:	98.0
Inside spring material working max. stress [N/mm²]:	710.0

Watch Basic data restore New configuration

BASIC DATA RESULTS	
FMin/FMax spring ratio:	0.333
Spring frequency obsccillation [Cycles/m]:	127160.2
Harmonics excitation spring:	40.0
Spring frequency / cams shaft frequency ratio:	84.773

OUTS. SPRING DIMENSIONS AND FEATURES	
Spring mean diameter [mm]:	28.32
Spring wire diameter [mm]:	4.68
Mean diameter / wire diameter spring final ratio:	6.053
Free length [mm]:	41.32
Length at opened valve [mm]:	37.0
Block length [mm]:	12.87
Used turns number:	1.0
Total turns number:	2.75
Distance between turns [mm]:	24.13
Max. force at opened valve [N]	795.15
Block force [N]:	5284.46
Stress at closed valve [N/mm²]:	233.27
Stress at opened valve [N/mm²]:	699.93
Block stress [N/mm²]:	4651.62
Mean spring flexibility [mm/N]:	0.0057
Mean spring stiffness [N/mm]:	176.72
Spring's Wahl factors:	1.25

Inside spring

Print Close

Results query chart

Soft-Engine engine simulation software – software “Spring”

Versions

Version
Spring 2.0 W

PC mininum configuration

Feature	Description
Processor:	Any personal computer IBM compatible.
System:	Windows ME, NT, Xp, Vista, Seven, Eight, Ten - 32 or 64 bit systems.
Memory RAM and Hard Disk:	At least 512 MB RAM and 2 GB free in the hard disk (for best Windows performances).
CDrom or Dvdrom device:	Speed at least 52X.
Graphic card:	VGA, SVGA and compatible cards, set at least 32 bit, Min. resolution: 1024x768.
Miscellaneous:	Keyboard, mouse, at least 1 USB port free (to connect the printer).
Printer:	Any ink-jet printer. Total compatibility with laser printers.
Total compatibility with notebooks and cases minitower PC.	