

SET-UP TWO STROKE - *presentation*



The software SET-UP TWO STROKE at opening is in this way

SET-UP TWO STROKE - *data entry*

The first data to be entered are those related to the engine. The majority of the data is easily detectable, while for what concerns Trapping Ratio, Turbulence and Volumetric Efficiency, the software has already pre-set the values most usual and in any case will be to you recommended by NT-Project in relation to your engine and his level of preparation.



Among the parameters on which it intervenes in the fine tuning there are certainly the squish, the compression ratio and the opening angle of the exhaust ports, and these are changed by adjusting the thickness of the cylinder and head gaskets, for this in the software over the standard configuration, you can enter other combinations of these parameters (yellow rectangle).

Compr. Ratio	/	12	13.0	11.6
Exh. opening	deg	82	83.65	81.18
Squish Height [mm]		1	0.6	1.2
Squish Band [mm]		7		
Head Gasket [mm]		0.4	0.8	0.2
Cylinder Gasket [mm]		1	0.2	1.4

The software immediately shows you how change the relative values to vary the thicknesses used for the gaskets (yellow circles)

SET-UP TWO STROKE - *data entry*

In addition to the functionality of the automatic calculation of the compression ratio, the height of squish and the exhaust opening to vary of the thickness of the gaskets, **the software SET-UP TWO STROKE both for compression ratio and for opening of the exhaust port, will immediately calculate the value in different units available**, this can be useful to know the compression ratio of knowing the volume of the combustion chamber and vice versa, or to know the angle of the exhaust note its distance from PMS and vice versa.

Compr.Ratio	/	11.5	11.8 cc
Exh.Opening	mm	26.6	81.99 deg

Compr.Ratio	cc	11.5	11.75
Exh.Opening	de	80	25.64 mm

If you have a thermocouple for detecting the temperature of the exhaust gases is possible to enter the value that you've in maximum power, otherwise the software can work equally.

vehicle	
Max Speed [Km/hr]	<input type="text"/>
Front Sprocket	<input type="text"/>
Rear Sprocket	<input type="text"/>



In addition to the engine data, in the software you can enter the data for the final drive ratio and the maximum speed that you have on the track where you want to optimize the setup. Since the changes in the weather varies significantly the engine performance, thanks to these data, the software will calculate how to change the gear ratio to have the best use of the engine under the new conditions.

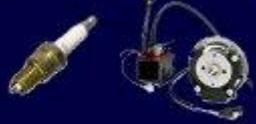
SET-UP TWO STROKE - *data entry*

carburation	
Carburetor [mm]	<input type="text"/>
Air / Fuel	/ <input type="text"/>
Main Jet	<input type="text"/>



After you must enter the information about the carburation, the diameter of the carburetor which is applied to the engine, the state of the carburation in the initial conditions (you must enter a value of Air / Fuel Ratio detected by the oxygen sensor or that identify the state of carburation, lean , optimal or rich). Finally, the main jet which is mounted in the initial conditions. Since the carburation is fundamental, the software allows you to enter other values (yellow rectangle) in order to assess the effects that give other calibration on reliability and performance of the engine.

ignition	
Timing	mm <input type="text"/>
Ecu Timing	<input type="text"/>
Heat Range	<input type="text"/>
Spark Gap [mm]	<input type="text"/>



Then you enter the informations about ignition, first of all the ignition timing mechanically applied to the engine, then the eventual advance imposed by the ECU. In addition to these data should be entered the heat range and the gap of the spark plug that you are using.

Like for the opening of the exhaust port, **also for advance of ignition the software will automatically calculate the value in the other unit** and this can be useful during stage of setting.

Ignition Adv	mm	2
	deg	-19.9

SET-UP TWO STROKE - *data entry*

weather	
Pressure [mbar]	<input type="text"/>
Temperature [°C]	<input type="text"/>
Humidity [%]	<input type="text"/>



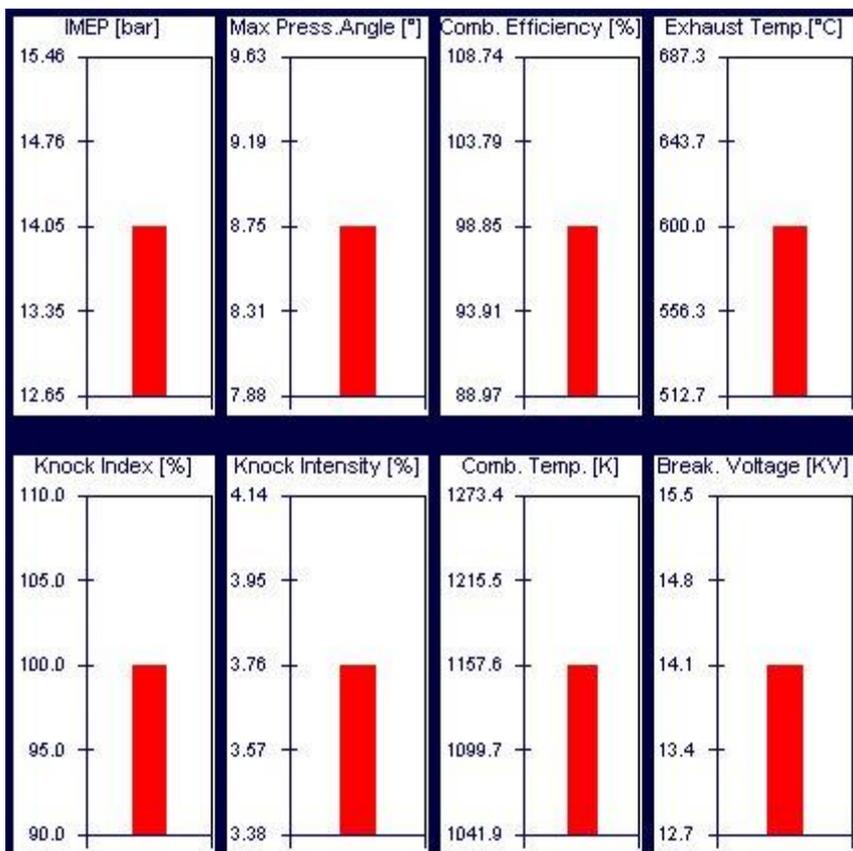
The latest data entries are related to weather conditions that occur in the standard configuration and those for which you want to calculate the new optimal fine tuning (yellow rectangle).

fuel	
Octane Number	<input type="text"/>
% Oxygen	<input type="text"/>
% Oil	<input type="text"/>
Density [Kg/m ³]	<input type="text"/>



In addition to the weather conditions the software also gives the possibility to insert the information on the fuel used, it often happens that a second of the championships is imposed upon the use of various gasolines and these alter significantly the carburation and combustion, therefore it becomes fundamental take account of this to obtain the correct setup and to have quickly the optimal fine tuning.

SET-UP TWO STROKE - *results*



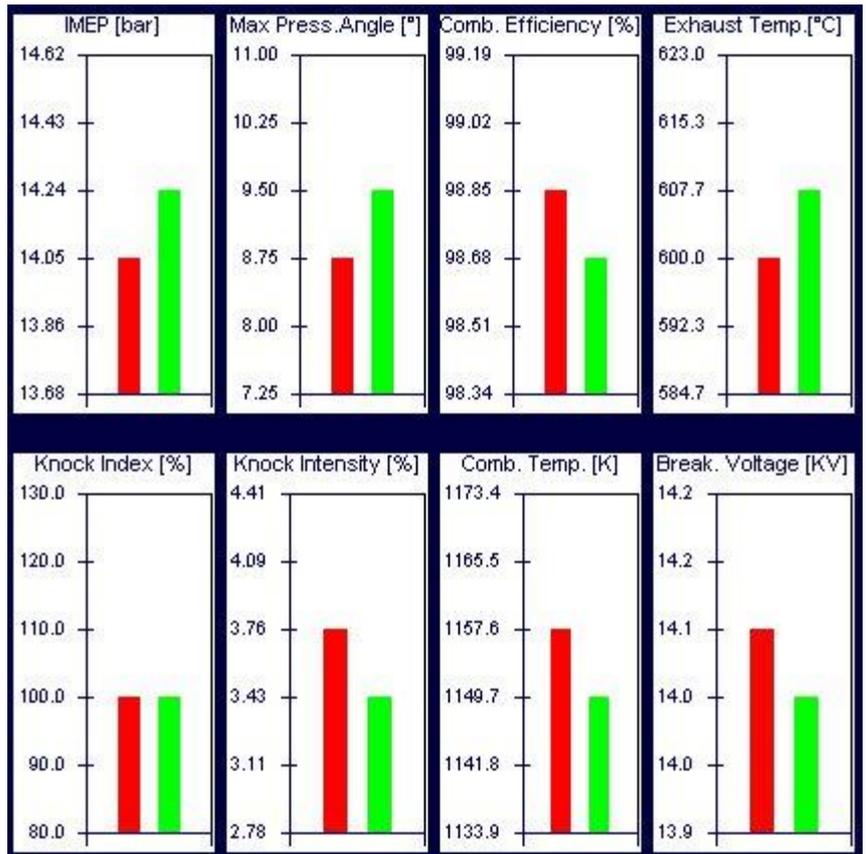
After entering the motor data, those of carburetion and ignition and atmospheric the software **SET-UP TWO STROKE** calculates the variables that allow you to evaluate the performance and reliability of the engine.

As we'll see in detail later, the analysis of each of these variables can provide **important information on the state of fine tuning which you've initially**, but especially these quantities will be the reference for when you'll enter new atmospheric conditions, because you'll have the opportunity to see immediately how they change, and **how you should intervene to return at the same optimal conditions.**

SET-UP TWO STROKE - *new atmospheric conditions*

At this point, inserting the new atmospheric conditions the software SET-UP TWO STROKE calculate how to change the performance and reliability of the engine.

weather		
Pressure [mbar]	1013	1002
Temperature [°C]	20	13
Humidity [%]	40	67

SET-UP TWO STROKE - *optimal fine tuning*

From comparison of the variables calculated in the new atmospheric conditions the software SET-UP TWO STROKE determines how to change the performance of the engine and the operating conditions of the engine and spark plug.

At this point SET-UP TWO STROKE recommend actions to have the fine tuning to improve the performance and reliability engine in the new conditions

results	
Power Max Speed	13558 rpm
Power Max	+1.78 %
Torque Average	+1.35 %
Head Temperature	-7.68 °C
Cylinder Temperature	-7.28 °C
Detonation	-0.33 %burn
Spark Temperature	-7.9 °C
Breakdown Voltage	-0.072 KV
Exhaust Temperature	+7.7 °C
Max Pressure Angle	+0.75 °m

advised interventions	
Heat Range	10
Spark Gap	0.81 mm
Front Sprocket	19
Rear Sprocket	26
Ignition Timing	1.74 mm
advised set-up	
Main Jet	161

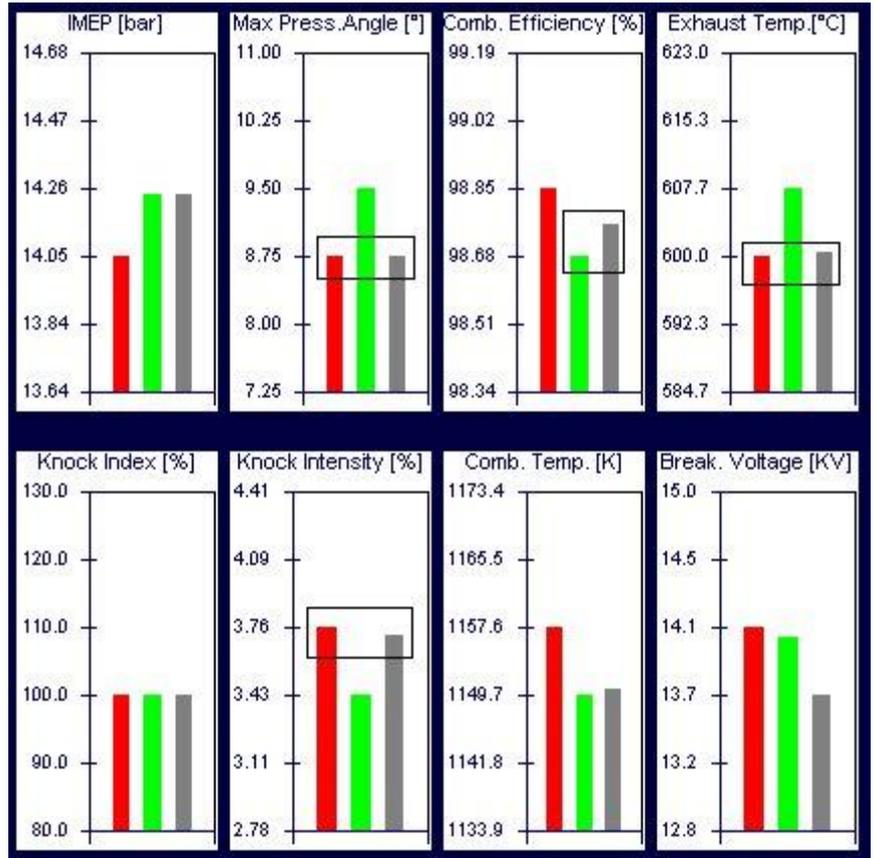
First of all shows you how to change the main jet to adjust the carburetion to the new conditions, then shows you how further to maximize the performance by intervening on the advance ignition and spark plug. Also advises you how to modify the final transmission ratio because the engine power can vary greatly in different atmospheric conditions.

SET-UP TWO STROKE - *optimal fine tuning*

Addition to advising you changes to carburetion, ignition timing and spark plug, the software SET-UP TWO STROKE gives you the possibility to enter into a separate column "TEST" these new settings to see if they meet your needs in full or if you want to sharpen again the fine tuning.

In the example shown the new settings allow you to move back at the same angle of maximum pressure, at the same exhaust gas temperatures and at the same level of detonation, of the initial conditions. Further it allows an increase of combustion efficiency.

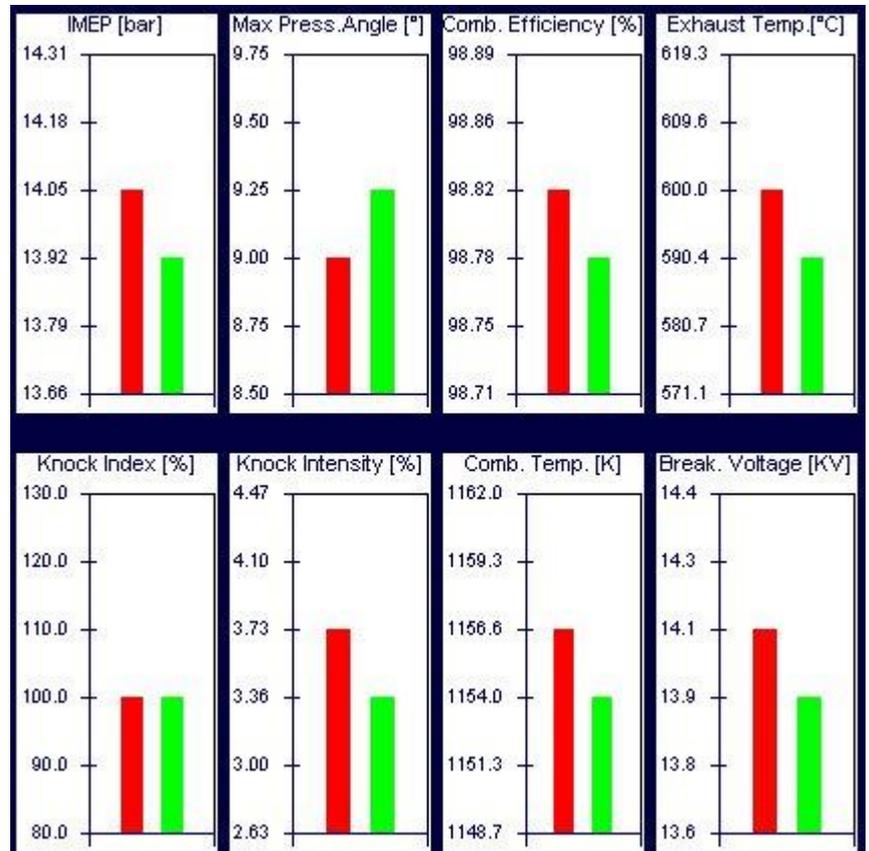
If, however, you need for example to increase the exhaust gas temperature or to have a lower combustion temperature, etc.. you can try other combinations of carburetion and ignition timing until you get what satisfies you.



SET-UP TWO STROKE - *new engine configuration*

The software SET-UP TWO STROKE in addition to allow you to find the optimal fine tuning when changes the weather conditions, allows you to do this also when you make changes to the engine, for example by acting on the head and the cylinder gaskets to alter the compression ratio, the height of squish and the exhaust opening angle.

Compr. Ratio	/	12	11.8
Exh. opening	deg	82	82.62
Squish Height [mm]		1	1.1
Squish Band [mm]		7	
Head Gasket [mm]		0.5	0.9
Cylinder Gasket [mm]		1	0.7



SET-UP TWO STROKE - *optimal fine tuning*

From comparison of the variables calculated in the new engine configuration the software **SET-UP TWO STROKE** determines how to change the performance of the engine and the operating conditions of the engine and spark plug.

results	
Power Max Speed	13427 rpm
Power Max	-1.46 %
Torque Average	-0.92 %
Head Temperature	-1.12 °C
Cylinder Temperature	-0.47 °C
Detonation	-0.37 %burn
Spark Temperature	-2.7 °C
Breakdown Voltage	-0.169 KV
Exhaust Temperature	-9.6 °C
Max Pressure Angle	+0.25 °m

As was seen for the weather conditions also for new engine configurations the software **SET-UP TWO STROKE** recommend actions to have the fine tuning to improve the performance and reliability engine in the new conditions

advised interventions	
Heat Range	OK
Spark Gap	0.81 mm
Front Sprocket	19
Rear Sprocket	26
Ignition Timing	1.64 mm
advised set-up	
Main Jet	160

Thanks to the software **SET-UP TWO STROKE** in addition that for new atmospheric conditions, or engine configurations, it can quickly search the **optimal fine tuning** also in case you need to change the type of gasoline used or the percentage of oil that you put in the mixture.

SET-UP TWO STROKE

How could you see in this brief presentation, the weather **conditions** have a **global influence** on the operation of the 2-stroke engine, in fact, change: speed and efficiency of combustion, engine and exhaust temperatures, and detonation conditions, etc..

With the software **SET-UP TWO STROKE** you can control all the variables influential **PERFORMANCE** and **RELIABILITY** and to have rapidly the indications for an optimal fine tuning of:



SET-UP TWO STROKE

CARBURETION

IGNITION ADVANCE

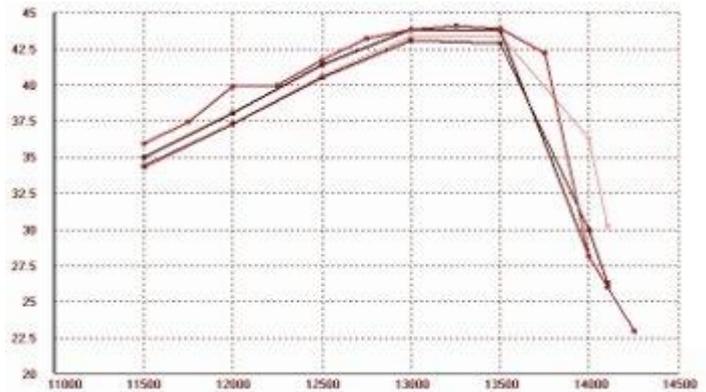
HEAT RANGE SPARK PLUG

SPRAK PLUG GAP

In addition to different weather conditions, you can have the indications to have an optimal fine tuning also for new engine configuration (**SQUISH**, **COMPRESSION RATIO** e **APERTURA SCARICO**), or for different **FUEL** or different **MIXTURE**

Thanks to **SET-UP TWO STROKE** you can have certainly an **weapon** winning to make the difference!

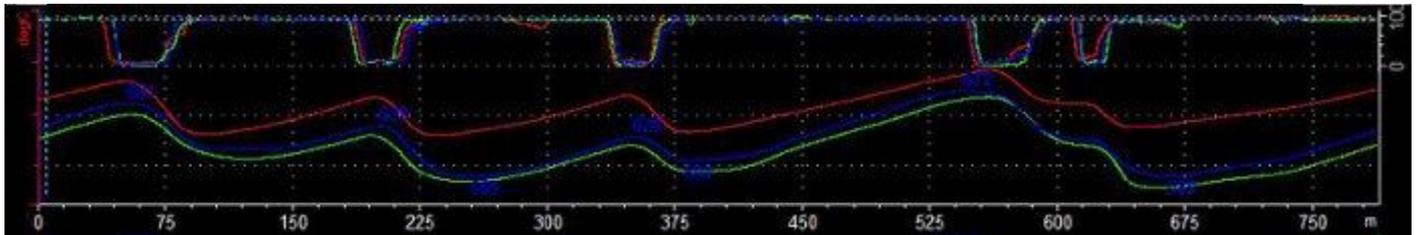
SET-UP TWO STROKE



Tempo	Metri	Ex Temp			RPM		
		Min	Max	Media	Min	Max	Media
43.10 sec	976	410	645	556	7532	14998	12148
42.90 sec	967	390	644	544	7702	14987	11947
41.99 sec	972	439	647	573	7511	14981	12312
42.30 sec	971	423	643	560	7543	14994	12219
41.50 sec	965	431	647	573	7462	14999	12303
41.90 sec	974	401	643	574	7348	14996	12318
42.50 sec	978	442	648	572	7535	14996	12288

Many dyno tests and data acquisitions measurement on track, have confirmed the fundamental importance of the information provided by the software for fine tuning both for performance and for temperatures and detonation.

Valori misurazione			
Stro	3	9	13
Time tot	0:49.70	0:44.88	0:44.60
m. total	1:47.64	6:12.78	9:39.63
m. total	1624	6363	9494
Time Lap	0:00.25	0:00.18	0:00.23
m. Lap	5	5	5
Ex Temp [°C]	665	639	628
RPM [rpm]	12574	13220	13453



SET-UP TWO STROKE - results detail

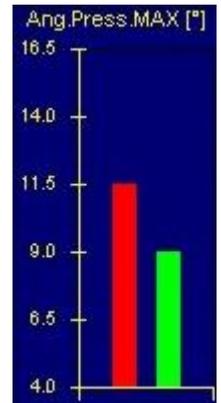
Indicated Efficiency

When change the weather conditions, changes the course of combustion and the development of pressure during the engine cycle and therefore the optimal use of energy developed by the combustion in power, thanks to the SET-UP TWO STROKE you can find the advance of ignition to have the best indicated efficiency of engine.



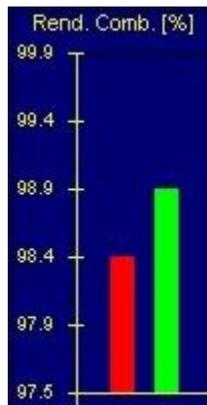
Max Pressure Angle

The different development of combustion under varying atmospheric conditions leads to move the angle at which you have the maximum pressure in the cylinder, so thanks to the SET-UP TWO STROKE you can see the shifting of this corner and act accordingly on the advance ignition to find the optimal value.



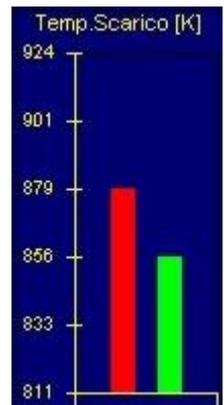
Combustion Efficiency

The conditions under which combustion occurs and the characteristics of the mixture affect the development and the speed of combustion. SET-UP TWO STROKE will show you the combustion efficiency under varying conditions.



Exhaust Gas Temperature

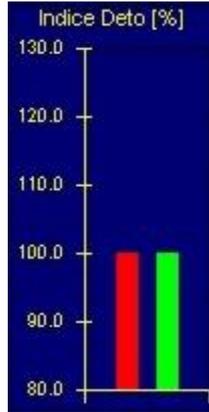
The weather conditions as well as change the amount of burnable fuel, change the course of combustion, so that the pressure and temperature at the opening of the exhaust ports are changing and this affects significantly the response of the exhaust system and consequently the trapping efficiency.



SET-UP TWO STROKE - *results detail*

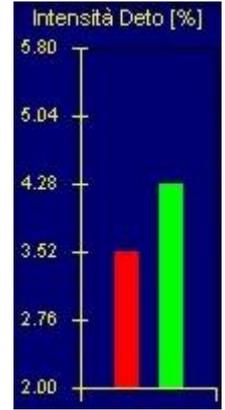
Detonation Index

The detonation is related to the pressure and temperature that occur in the cylinder during combustion. Thanks to SET-UP TWO STROKE you can see how the weather conditions change the development of combustion and then evaluate the level of detonation risk from one situation to another.



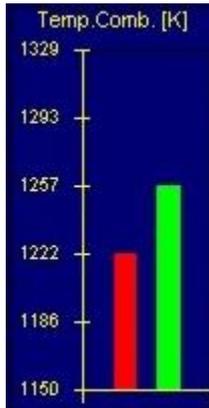
Detonation Intensity

Under certain weather conditions or setting, you may get in the detonation, in this case thanks to the SET-UP TWO STROKE you can evaluate the intensity and to see which level may be acceptable without compromising the reliability.



Combustion Temperature

The temperature of the environment and the different development of the combustion change the heat exchange and then the temperature of the engine and of the spark plug. SET-UP TWO STROKE will allow you to understand in advance how changes the thermal state of the engine and thus to avoid choices that can compromise reliability.



Breakdown Voltage

To changing weather conditions, Ignition and carburation, the physical conditions when the spark must start, are different and therefore may be necessary to review the spark gap. Thanks to SET-UP TWO STROKE you can evaluate these changes and respond accordingly.

