

## TECHNICAL COMMERCIAL CATALOGUE

Via Sandigliano, 181 13878 - Candelo (BI) Tel. +39 015.8129887 / 936 Cell. 346-3536253 www.derossimassimo.it e-mail: info@derossimassimo.it

# **MM100**

#### WHAT IS IT FOR?

It is a valid alternative to the oscilloscope. It allows you to test the existence of power signals of the various components.

#### IT TESTS THE FOLLOWING COMPONENTS:

Common rail electroinjectors, petrol/gpl electroinjectors, piezo electric injectors, flow regulator solenoid valves, egr solenoid valves, variable geometry solenoid valves, coils, etc...

#### **ADVANTAGES:**

SPEEDY USE: no need to bore wires, no need of interfaces. In order to perform the diagnosis of the individual components of the electrical system all you need to do is hold the probe near the component in question.



MM100 Immediate signal detectors

## **APPLICATION EXAMPLES**

IN ORDER TO PERFORM THE DIAGNOSIS OF THE INDIVIDUAL COMPONENTS OF THE ELECTRICAL SYSTEM ALL YOU NEED TO DO IS HOLD THE PROBE NEAR THE COMPONENT IN QUESTION.

MM100 in testing the electromechanical/electronic components of a ECU controlled motor allows you to establish that:

- •The box is being fed and performs its control function.
- The wiring from the ECU to a component is in good working order.The component in question is not interrupted.
- •The component in question is not in short-circuit towards negative.
- •The component in question is not in short-circuit towards positive.
- •The component in question is functioning electrically.

To detect the signal, hold the probe of MM100 near the point indicated by the arrow.



**RPM / PHASE SENSOR** 

**HIGT VOLTAGE COIL** 

**HIGT VOLTAGE COIL** 

**HIGT VOLTAGE COIL** 

**SPARK PLUG** 

#### **COMBINATIONS:**

MM100 can be used in combination with:

MM100/A - MM101 - MM103



#### PRESSURE SENSOR SIMULATOR FOR COMMON RAIL FUEL

Coupled with MM100, it allows the electrical control of the injectors when fuel pressure is missing, giving operators the certainty of electrical measurement.

COMPARATIVE TESTS BETWEEN OSCILLOSCOPE AND MM100	LOW VOLTAGE OSCILLOSCOPE	HIGH VOLTAGE OSCILLOSCOPE	MM100
SPEEDY USE			x
PRACTICALITY OF USE			x
NO NEED TO USE INTERFACES			x
IT DOESN'T REQUIRE THE USE OF WIRE PUNCHER			x
IT DOESN'T REQUIRE CONNECTION TO NEGATIVE OF THE VEHICLE IN QUESTION			x
POSSIBILITY TO ANALYZE THE ELECTRICAL SIGNAL IN ABSENCE OF PRESSURE ON THE COMMON RAIL SYSTEM			X WITH MM100/A
PROOF OF ELECTRICAL SIGNAL EXISTENCE	X	X	x
PROOF OF COMPONENT FEEDING	x	X	x
TIME READING AND VOLTAGE SIGNAL	x	X	
WORKING RANGE 5/250 VOLTS	x	X	x
WORKING RANGE 5/50000 VOLTS		X	x

## Some cases in which MM100 becomes essential:

•In the case where a common rail system doesn't start, in order to establish whether the problem is electrical or of fuel supply.

•In the case where a common rail system functions with one cylinder less because there is an electrically damaged injector.

•In the case where a common rail system functions with one cylinder less because there is a damaged wiring injector.

•In the case of a petrol car which doesn't start, if there is an electric comand to both the spark plugs and the injectors, the problem is due to lack of fuel supply.

•In the case of variable capacity air-conditioner compressors, in order to analyze if the compressor controller regulator is powered by the air-conditioning control unit.

•If there is the doubt that the EGR valve is doing its job, in order to establish if it is controlled by the control unit and if it isn't working because it's particularly encrusted/dirty.

•In the case when a variable geometry tends not to move, in order to assess whether the problem is the electric control or the bad condition of the turbine.

#### MM100 IS A PATENT PENDING PRODUCT



MM100 was awarded at the salon of inventions in Geneva with the

BRONZE MEDAL!!

# **MM101**

#### WHAT IS IT FOR?

It commands components such as EGR valves, variable geometry and new generation air conditioning compressors with a PWM command variable from 10 to 90% in complete autonomy from the ECU

#### **ADVANTAGES:**

Possibility to operate independently. It helps you to realize if the component is functioning mechanically. In combination with cleaning systems it can be decisive. In the control of air conditioning system it's essential to determine the efficiency of the compressor and its control valve.



MM101 solenoid valve control

# MM101 allows you to test the efficiency of EGR solenoid valves – variable geometry turbine regulation solenoid valves.

In order to perform the diagnosis on the components of the electrical system all you need to do is connect the MM01 using the wiring of the part in question and vary the control using the potentiometer. **COMBINATIONS:** 

MM101 can be used in combination with:

MM100 - MM101 - MM103 - MM101/L

## MM101/L



#### **CABLE KIT FOR EXTERNAL REGULATION COMPRESSOR CONTROL**

Connected with MM101, it allows you to drive a variable flow compressor regardless of the vehicle electronics.

# **MM103**

#### WHAT DOES IT DO?

It reads the PWM signals that a simple multimeter cannot read.

It replaces the use of the oscilloscope, hard to

interpret in case of uncertainty.

It determines if the command is DC or

Duty Cycle to prevent unpleasant damage.



#### MM103 electronic tester

MM103 allows you to measure, through a light and sound signal, the command voltage (3 to 250 volts) and the Duty Cycle command (10% to 100%), in an electronic system.

It allows you to test the electric command efficiency of components such as:

Common rail electro-injectors, petrol/gpl electro-injectors, piezoelectric injectors, flow regulation solenoid valves, egr solenoid valves / variable geometry solenoid valves / etc.

#### COMBINATIONS:

MM103 can be used in combination with:

MM100 - MM101

## **PWM KIT**

#### WHAT IS IT FOR:

It represents a valid help in troubleshooting on PWM controlled components.

With its extensive range of cables you can connect to a multiple number of components: EGR valves, variable geometry, compressors for variable displacement air conditioners, latest generation lights, flow and pressure regulator, etc..











• How can I determine if the component is controlled by the ECU in direct voltage or in PWM?

#### With MM103

• Once I have established that the driving is in PWM how can I see the command percentage?

Still with MM103 (by pressing the key)



VERY IMPORTANT: Through the cable kit I can connect MM103 letting the ECU power the compressor



With this configuration I can power the compressor with MM101 and check the pressure variation with the high pressure gauge of the climate charge, all this excluding the CLIMA control unit.



With this configuration with MM101 and MM103 connected I can pilot the system with MM101 and check with MM103 if the ECU tends to correct my variations





## Cleaning component on the bench



Ultrasonic cleaner

## Test component on the bench



## Other examples of examinable components:

#### **Pneumatic actuators**





Flow regulators



### LED lights





#### WHAT IS IT FOR?

It has many applications; for example, it can test a high pressure C.R. system WITHOUT REMOVING ANYTHING, it can also drive the pressure up to 1100 bar to control the pump, the regulator and the injectors.

#### **ADVANTAGES:**

#### ON THE CAR, IT TESTS:

High pressure pump, pressure regulators, flow regulators, injectors return to 1100 bar, coil injectors.

ON THE BENCH (TEST WITH MANUAL PUMP): It tests injectors to display: tightness, minimum opening pressure, spray quality.



MM03

## **PATENTED PRODUCT!**

MM03 has three main functions:

- High pressure gauge
- Management of Bosch Delphi Denso Siemens common rail pumps
- Bosch Delphi Denso Siemens common rail injectors command (piezo option)

MM03 is able to verify the tightness of the injectors, the efficiency of the high pressure pump, the efficiency of pressure and flow regulators, the functionality of the fuel pressure sensor.

#### **COMBINATIONS:**



Used with a kit of graduated containers it is able to verify the injector tightness up to a pressure of over 1000 bar..

Together with an injector pump test and an aspirator, it is able to verify the functionality of the injector, controlling:

- Injection
- Opening pressure
- Jet spray
- Tightness and quantity of diesel recovery.



In combination with MMX, it allows you to perform the following tests:



- High-pressure pumps efficiency
- Injectors tightness
- Flow comparative test injectors in goodwill, average load, full load, pre-injection simulation, pilot injection.

#### ACCESSORIES:

Used with MM03 KP it allows you to test Bosch and Siemens piezoelectric injectors.



Used with MM03 KS it allows you to test Siemens pumps.



## -BLUETOOTH SOFTWARE for MM03-

Also available in English

### **HIGH PRESSURE GAUGE FUNCTION**





### CONTROL PUMP REGULATOR FUNCTION







### INJECTOR CONTROL FUNCTION

🖷 . Iniettori		
	TEST INIETTORI	VERIFICA INIETTORE BOBINA BOSCH COMMON RAIL
	INIETTORE 3 COD. 0445110119	Codici identificazione Connettore elettrico
PRESSIONE 317 bar	parametri di test TEMPO APERTURA [ms] 1,0 FREQUENZA IMPULSI [Hz] 4	Ritorno Raccordo alta pressione Polverizzatore
	TENUTA OK. PRESSIONE APERTURA 200 bar GETTO NO	Collegare l'iniettore alla pompa manuale tramite il raccordo alta pressione
	PRINT	Posizionare l'iniettore con il polverizzatore dentro l'aspiratore.

### INJECTOR CONTROL CYCLE FUNCTION

s, CICU			
CICLI AVVIAMENTO FREQUENZA IMPULSI [Hz] DURATA IMPULSI [ms] PRESSIONE VOLL 8 1,0 300	JTA [bar]		
PRESSIONE 300 bar	1500 bar 1200 - 900 - 600 -	ATTENZIONE!!! Per utilizzare questa sezione è necessario abbinare MM03 ad una pompa che generi una pression <mark>e</mark> costante.	
CLEAR BASE 100 + sec SCALA 1 + PRESS 1 + PRESS 1 + 100 d	0 bar		
COD. 0445110119 IMA 102746583934 TABELLA CICLI TABELLA CICLI TABELLA CICLI	/E		
#### CYCLE TABLE: it allows you to perform comparative tests between the injectors

INIETT		3		
COD.	0445110119	3		
IMA T	10274658393	34		
	PORTAT	A	RITORN	10
TENUTA	0	ml.	0	ml.
AVVIAMENTO	40	ml.	15	ml.
MINIMO		ml.		ml.
MEDIO CARICO		- ml.		ml.
PIENO CARICO		- ml.		ml.
INIEZIONE PILOTA MJ		- ml.		ml.
PRE-INIEZIONE MJ		- ml.		ml.
INIEZ. PRINCIPALE MJ				



codice Bosch: 0445110119

PR	OGRAMMA MM01	RANGE Q.tà iniettata			RANG	E RITO	RNO	
1	Tenuta	0	cm³	toll. 0 %	max.	10-15	cm <sup>3</sup>	toll.*/-10 %
2	Avviamento	6,5-17	cm³	toll.*/-10 %	max.	10-15	cm³	toll.*/-10 %
3	Minimo	12,5-18,5	cm <sup>3</sup>	toll.*/-10 %	max.	10-15	cm <sup>3</sup>	toll.*/-10 %
4	Medio	21-30	cm <sup>3</sup>	toll.*/-10 %	max.	20-30	cm³	toll.*/-10 %
5	Max	56-69	cm <sup>3</sup>	toll.*/-10 %	max.	30-40	cm³	toll.*/-10 %

#### **REFERENCE DATA TABLE**

#### **OBSERVED DATA TABLE**

### **CAR ENGINE**



### A REAL TEST BENCH FOR PUMPS AND INJECTORS

















COMPARATIVE TESTS BETWEEN DIAGNOSIS, OSCILLOSCOPE, CLOSED RAIL AND MM03	GENERIC DIAGNOSIS	OSCILLOSCOPE	CLOSED RAIL	MM03
PRESSURE REGULATOR COMMAND BY PASSING THE ECU				x
FLOW REGULATOR COMMAND BY PASSING THE ECU				X
SYSTEMS WITH FLOW AND PRESSURE REGULATOR COMMAND				x
INJECTOR TIGHTNESS TEST AT 900 bar				X
HIGH PRESSURE GAUGE	X		X	X
RETURN INJECTORS CHECK			X	X
COIL INJECTOR COMMAND BY PASSING THE ECU				X
PIEZO INJECTOR COMMAND BY PASSING THE ECU				X
TIGHTNESS TEST MANAGEMENT UP TO 500 bar			X	X
TIGHTNESS TEST MANAGEMENT UP TO 1100 bar				X
INJECTOR OPENING PRESSURE TEST ON THE BENCH (WITH MANUAL PUMP)				x
TIGHTNESS INJECTOR TEST ON THE BENCH (WITH MANUAL PUMP)				x
VISUALIZATION OF INJECTOR SPRAY ON THE BENCH (WITH MANUAL PUMP)				x
LOOP DUTY TEST ON PRESSURE REGULATOR TO CONTROL MALFUNCTIONING	x			x
WASHING REGULATORS FUNCTION ON THE BENCH				X
FORCED STARTING AT 900 bar				X
UNLOCK INJECTORS AT 900 bar				X



MMX is a real test bench for testing, quickly and with absolute certainty, Bosch / Delphi / Denso / Siemens VDO pumps and Common Rail injectors (both coil and piezo electric).

Handy, sturdy, efficient.

It's an innovative bench because it's electronically managed by a tester born to the diagnosis on the car: MM03 PC OR MM03 TRADITIONAL (both substitute ECU during the test on the car).

The bench allows:

- high pressure pumps efficiency test
- injector tightness test
- flow injectors comparative test during STARTUP, AVERAGE LOAD, FULL LOAD, PRE-INJECTION SIMULATION, PILOT INJECTION



The only system today that allows you to perform a series of tests on the car and test the components to the bench for review.



### Version with MM02

With this setup you have the ability to test 4 injectors simultaneously.



Both versions are available with different equipment

to choose according to your needs



#### TO COMBINE WITH MM02

Allows complete overhaul of Bosch CP4.1 / CP4.2 pumps



Thanks to the new software it is possible to view the correct functionality of the pump:

- managing the pressure of the pump in question
- checking the low pressure return of the rail through a flow sensor
- opening / closing the flow regulator on the pump

#### Availability of various spare parts:



Gasket and oil seal kit



Universal extractor kit



Tappet



CAM shaft

Spare parts kit



### MM02 SIMULATOR FOR COMMON RAIL PUMPS AND INJECTORS

It can be used to complete any diesel test bench without Common Rail technology or directly on the vehicle

Electronic control unit for management of:

- pressure regulators
- flow regulators
- electromagnetic / piezoelectric injectors -> AUTOMATIC COIL OR PIEZO RECOGNITION
- it can be used either in manual or automatic mode for comparative tests
- "road" simulation tests with special automatic software programs



Possibility to work with: PUMPS: Bosch, Delphi, Siemens, Denso INJECTORS: electromagnetic, piezoelectric

Possibility to use it in conjunction with a bluetooth software that allows the visualization on PC and the printing of graphs related to:

- manometer (system pressure)
- injector

- pumps (objective and effective pressure, max and min pressure reached, regulators working range)

## **MM104**

PATENT PENDING

#### DIAGNOSIS FOR THE PRE-HEATING SYSTEM

#### Tester for the control of the glow plugs and the control modules



#### CHARACTERISTICS:

The tester is able to:

- Recognize automatically the type of the glow plug in question (no need to set anything to start the test )
  Eg. Glow plugs controlled with duty cycle ( PWM ) and traditional glow plugs.
- •Check in a quickly and comparative way the glow plugs without removing them by the engine
- •Measure the resistance in hundredths of ohm at the beginning of the test

•Follow the absorption trend for the whole time of the test

• Display in hundredths of ohm the resistance value at the end of the test, determining the efficiency

The single glow plug test is stored in the instrument and then is displayed in both numerical and graphical form.

**N.B.** It is also possible to **verify the command signal that comes from the pre-heating module** or from the control unit and store the values. At the end of the test, by connecting the instrument to a PC, you get a summary print of the stored graphics.

The **MM104** Tester is a portable instrument that allows you to check in a few minutes the efficiency of the glow plugs and of the control modules directly on the vehicle, drawing power from the battery of the same vehicle.

In particular, the Tester can measure the resistance of the glow plugs at the beginning and at the end of the heating phase and perform a comparison of the measured values on the individual glow plugs. The measurement can be performed directly on the glow plugs of the vehicle using the probe included

the power cord, or on the

management module glow plugs of the control unit,

using the dedicated cable.



Cilindro 1 Cilindro 2 Cilindro 3 Cilindro 4



During the glow plugs test are shown the battery voltage and the current absorbed by the glow plug in question.

At the end of the test are shown the following results:

- 1. Maximum current absorbed by the glow plug;
- 2. Battery voltage;
- 3. Resistance of the glow plug at the beginning of the test;
- 4. Resistance of the glow plug at the end of the test;
- 5. % variation of the resistance;
- 6. Result of the test.



Then is displayed a simple comparative graph where the resistance of the glow plugs is represented by one or more "squares" positioned in correspondence of the measured value.

Ma	a x	172	7	013	3.4V	
R	in	iz	0.	64	ohm	
R	fi	ne	Ο.	69	ohm	
-	0	) К <b>—</b> -	-	(d=	- 8 % )	



By connecting the instrument to the control modules, you will see the effective voltage of the tested module.

Using the PC program you can graphically display the trend of the resistance of the glow plugs and voltages previously measured on the various outputs of the controller.



An adjacent box shows all the measured electrical data.



#### Glow plugs chart

In order to compare each other different glow plugs of the same type, verify that the colored lines on the chart are adjacent and parallel. More the lines are similar, more the characteristics of the examined glow plugs are uniform.

Control modules chart

In recent years, the glow plugs have become one of the fundamental components of the cars. In addition to facilitating the ignition of the fuel in a cold engine, they improve combustion by adjusting the temperature in the combustion chamber and they are useful for reducing emissions.

N.B. Starting from euro 4 engines, glow plugs remain on until the complete heating of the engine; on some euro 5 engines they are even piloted (with a PWM signal) during deceleration to maintain a stable temperature into the combustion chamber.

- During the filter regeneration, both spontaneous and forced, the glow plugs are driven to their maximum performance to reach maximum temperatures.

•One or more burned or not efficient glow plugs make that the system fails to perform the regeneration, clogging even more the egr / dpf exhaust system.

- In the new generations of systems, in case of anomaly on a component that concerns anti-pollution or safety systems, the entire electronic system goes into recovery.

•The glow plugs are part of the anti-pollution system and, in case of a malfunction (burning or inefficient glow plugs), **they send in recovery the system without the problem is recognized as a specific defect by the control unit.**  - Testing new glow plugs in a traditional way (feeding them with a 12 volt or making them "torched") you may damage them because some of these are powered by low voltage (4 volts pwm).

Use the right equipment allows you to diagnose and fix possible malfunctions in a simple and timely way.

•Whereas the glow plugs are used to improve combustion, they should all have the same efficiency. **MM104 can test the glow plugs in hundredths of ohm, giving the possibility to compare them in a precise way between them.** 

•Glow plugs faulty that do not heat up on the tip (but only in the rear) tend to get dirty carbonizing thickening and consequently the tip that, not reaching the right temperature, can't groom themselves. Once the tip of the glow plug is increased in diameter risks to break when it is extracted from its seat, making it necessary to dismantle the cylinder head. With MM104 you can control the parameters of the glow plug while working.

N.B. MM104 also allows you to test with certainty even the glow plug control module, especially those driven with a PWM signal.

	MM104	MULTIMETER	DEDICATED TESTER
Continuity tests	YES	YES	YES
Measurement of precision resistances	YES	DEPENDS ON THE MODEL	YES
Measurement / glow plug heating / measurement to determine the delta	YES	NO	NO
Full report of values for all the glow plugs tested	YES	NO	NO
Glow plugs comparative chart	YES	NO	NO
Preheating modules test	YES	NO	NO
Report of all the outputs of the pre-heating modules	YES	NO	NO
Print glow plugs test	YES	NO	NO
Print preheating module test	YES	NO	NO

# **MM105**

#### **COMPRESSION TESTER**



Portable instrument that allows you to check in a few minutes the compression efficiency of internal combustion engines directly on board of the vehicle, drawing power from the battery of the vehicle. If your car's engine misfires or has no power, the problem may be in the cylinders.

To find out where the fault is and be able to intervene, we must perform a compression test. To do this it is necessary to measure the pressure generated by the moving of each piston within the cylinder.

With MM105 you can check the compression in the cylinders of an internal combustion engine, both petrol and diesel, by just connecting to the battery.

Before performing the test, you must make sure that the battery is charged and is necessary to prevent the engine starts during the test. (Depending on the type of engine you can remove the fuse for the fuel pump, disable the injectors by unplugging the rpm sensor, etc.).



For using the tool you need to run the association in Bluetooth with a computer

on which it will be installed a special software.



After taking the proper precautions to prevent the engine from starting, connect MM105 to the vehicle battery via the crocodile clips (red on the positive terminal, black on the negative terminal).

COLLEGARE DISPOSITIVO Prova Compressione	MM105 S/N (9 digit)
COM port 3	SW CODE (12 digit)
collegamento BLUETOOTH 🌘	

Connect the instrument to the PC and start the program that will receive and analyze the test data.



Press the "START" button, and when it says "STARTING", turn the key up to set in motion the starter motor.

N.B. During the compression test on

petrol engines, you need to accelerate hard while holding down the accelerator pedal to fully open the suction throttle.



Keep in motion the starter (clutch pedal depressed) throughout the duration of the test and stop it only when it appears on the screen the words "STOP".



VBAT					
11V				BA	123
10.5V		AVVIAMEN	ТО		V min
10V		1	"		RPM
9.5V					_
DURATA PROV	λ 10 ÷ εec	¢+	÷	>>	- <b></b>



At the end of the test appears the graph of the frequency analysis for the calculation of the revolutions per minute (RPM), after which it will be shown the evolution of the battery voltage recorded during the test.





At the side will appear a bar graph that allows you to analyze the voltage drop per cylinder (in green) and the absorbed power for compression (in yellow).

Press the "NEXT" button to display two other windows: the electrical absorbed power and the relative compression.

The ELECTRIC POWER shown is the one absorbed by the starter motor in those moments when the compression takes place, it is an indication of the force exerted by the motor and the pressure reached in the cylinders.

C PROVA COMPRESSIONE	
POTENZA ELETTRICA A	SSORBITA
	362 W
	355 W
	361 W
	280 W

The absorbed power values depends on the temperature of the engine and on the internal resistance of the battery. They can be compared between a test and the other but ONLY under equal conditions.

In the diagram of the RELATIVE COMPRESSION you can see the differences between a cylinder and the other. In this case, the results are scaled so that the cylinders with the higher compression are 100% (Max) and they can always be compared between them.



Pressing again the "NEXT" button appears the status of the battery. The "vacuum voltage" bar shows the voltage measured before the test, without current consumption, and indicates the state of charge of the battery. The "voltage under load" bar shows the voltage at the peak of consumption of current.

This will give an indication
of the state of health of the battery:

Both values in the green belt
positive outcome

One or more values in the the yellow zone

signaling attention

One or more values in the the red band

malfunctions



N.B. The test results could be affected by: faulty starter motor, low battery, etc Pressing the "SAVE DATA" button at the end of a test, you can save the carried out tests. NOTE: If you want to review and analyze the tests done earlier, it is possible to continue as well without connecting MM105 to the PC.

	MM105	MECHANICAL COMPRESSION TESTER
Time	FEW MINUTES	HOURS
Accessories	NOT REQUIRED	FAKE INJECTORS / FAKE GLOW PLUGS
Number of starts at start-up	YES	NO
Starter motor absorption	YES	NO
Battery condition before the test	YES	NO
Battery condition after 10 seconds of failure start-up	YES	NO
Use with PC	YES	NO
Use with mobile phone	YES	NO
PC printing	YES	YES
Storage of the test on a PC	YES	NO
Pressure measurement	NO	YES
Comparison	YES	REDUCED

#### LAUNCH 602A pairing with MM105

When a car arrives to the workshop (gasoline, LPG or CNG powered) that runs unbalanced, the most likely causes are:

- Ignition problem;
- Mechanical problem on the engine (valves and bands);
- Problem on the injectors.

Excluding a possible ignition problem, we are faced with the following doubt: injectors or engine?

To find out it, we can proceed as follows:



Portable tool that allows you to check,

Proceed to wash the injectors with LAUNCH 602A + MM107

## **MM106**

The MM106 Tester is a portable instrument that allows you to check in a few minutes the efficiency of the battery and the vehicle charging system (alternator and battery), drawing power from the battery of the vehicle.

SOC STATE of CHARGE (variazione durante la prova) Through a series of tests, you can check the following parameters: 0,1 Ah QUANTITA' di CARICA **STATE OF CHARGE:** uscita dalla batteria entrata. SOC nella batteria It shows how much energy has been taken by the services and how much they have been - State Of Charge -Q-OUT Q-IN <sup>0,2</sup> Ah 0,1 Ah restored in battery by the alternator. **STATE OF ENERGY:** It indicates the total energy stored in a SOE battery; It depends on the voltage available SOE STATE of ENERGY - State Of Energy at terminals of the battery. Normally the value should not fall below 0.6-0.7. **1,0** 100% STATE OF HEALTH: After inserting the battery data, indicates its SOH real efficiency (depending on internal - State Of Health resistance), and the ability to provide current SOH without voltage drops. STATE of HEALTH

CALC



Ability to view snapshots of the test, divided into fractions of 10 seconds.



Ability to view the ripple on the voltage of the battery during charging from alternator.

They will see both the wave trend in detail at the selected point, and some comparison examples.

Ability to view the progress of the current during the test, and the internal resistance of the test battery with a refund of the following data:

- 1. Initial unladen voltage
- 2. Maximum start-up discharge I MAX
- 3. Minimum voltage in start-up V MIN
- 4. Maximum charging current by alternator I MAX
- 5. Maximum charge voltage from alternator V MAX
- 6. Final unladen voltage
- 7. Internal nominal resistance (in milliohms) is calculated with the battery plate data
- Internal maximum resistance (in milliohms) is measured at the moment of maximum current discharge
- 9. Internal average resistance (in milliohms): value that determines the battery aging state (marked with or v or v)



## **MM107**

MM107 is a device for testing the injectors using some static and dynamic tests for Otto cycle engines of the following types:

- Gasoline Top feed (Multipoint systems "MPFI")
- Gasoline Side feed (Multipoint systems "TBI" Multipoint "MPFI")
- Gasoline Direct Injection / FSI / TSI / GDI / JTS
- Gas LPG (Landi systems, BRC)

The system allows to:

- Clean the injectors in ultrasound washing machine;
- Test them for leaks, flow, splash and flow rates;
- Simulate their operation on car with three automatic cycles

The kit includes:

- Launch injector cleaner -> art. CNC 602 A
- Converter LPG / direct injection
   / FSI / TSI / GDI / JTS signals -> art. MM107
- Dedicated Rail (Landi, BRC)
- Ultrasound washing machine
- Fluid for ultrasound washing machine
- Fluxing fluid for injectors
- Service Parts Kits


	LAUNCH 602A	LAUNCH   LAUNCH 602A + MM107	Image: August of the second
INIETTORI BENZINA INIEZIONE	X	X	Χ
INDIRETTA		X	Χ
INIETTORI GPL LANDI / BRC			X



Thank you for your attention

