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1967 - 2017



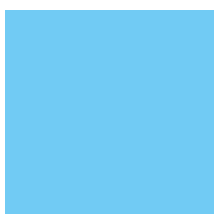
**MECHANICAL SECTIONS
TRAINING EQUIPMENT**



MADE IN ITALY

14th Edition





Simulators

VB 4503E HYBRID AND ELECTRIC SYSTEM SIMULATOR - electrical

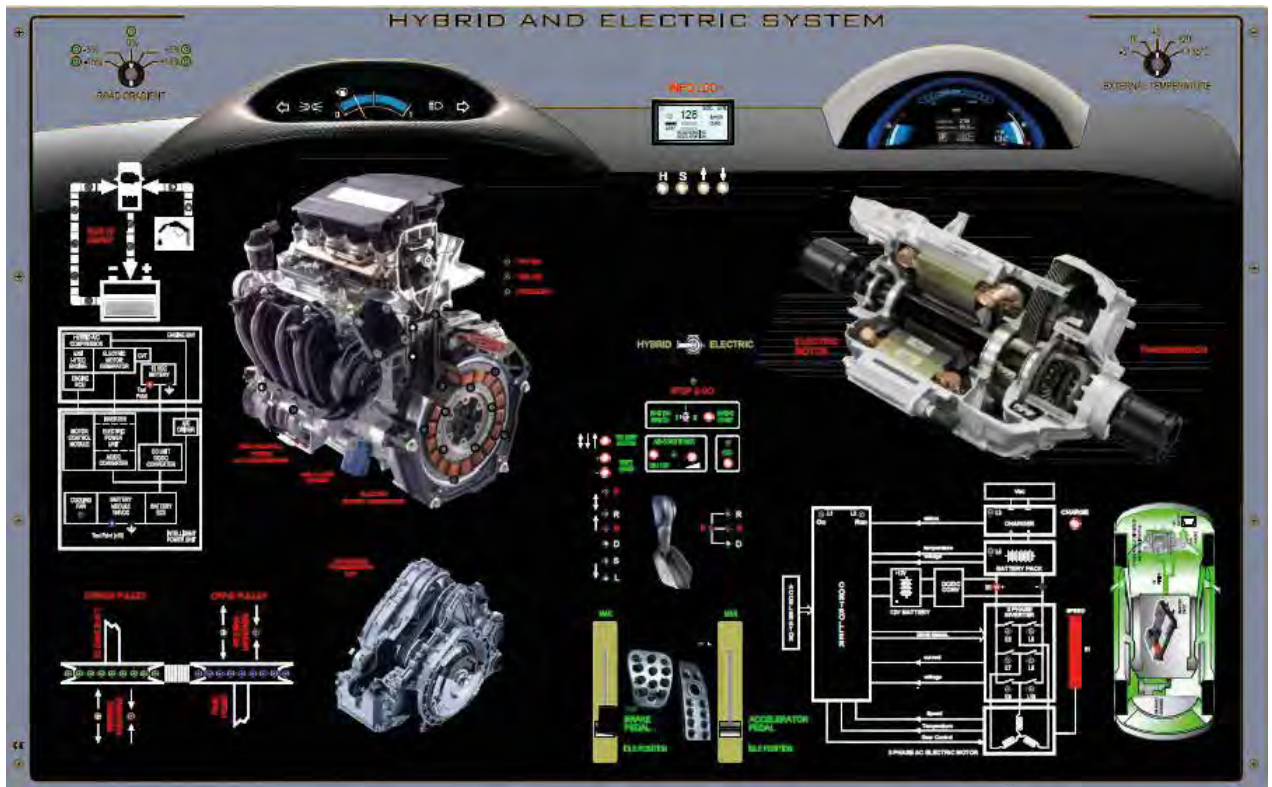
This simulator allows the study of all the operating features of an automobile with a hybrid system (internal combustion engine and electric motor) or completely electric.

It is composed of a panel operated by computer with a silk-screened diagram which explains the positioning of the car components and indicates the features of the system by showing different colours on the panel. Moreover light indicators are on the panel to show for the operation of the system.

Through the computer, the teacher can monitor the entire system and the operational states entered by the students. Moreover, the faults can be inserted and checked by the teacher and with the use of the software practical and theoretical topics can be constantly followed.

An english manual is supplied together with the unit.

The silk-screened panel shows:



Indicative picture for reference only

Hybrid system:

- Intelligent Power Unit
 - Battery unit (Ni-MH cells)
 - ECU battery
- Electric Unit:
 - Synchronous 3-phase Electric Motor/Generator with permanent magnets
 - Eco Assist System
- Gasoline Unit :
 - Gasoline Engine
 - i-DSI
 - i-VTEC
 - ECU
- CVT
- A/C Compressor- dual-scroll hybrid mode
- Cooling Fan
- Motor Control Module
- Electric Power Unit
- DC Unit
- A/C Driver

Electric System

- High-voltage battery module, (Li-ion cells)
- Recharging system by external AV
- 12V battery and recharging
- Electric motor control system
- 3-phase inverter for managing the electric motor
- Inverter control signals and sensors for the voltage and current measurement
- 3-phase AC motor with integrated transmission system
- Integrated sensors in the AC three-phase motor

The simulator is complete with Training Software and with Control Software.

The software guides the student through the learning, simulation and experiments performance, tests and troubleshooting.

Approx. weight and dim.:

Cm: 104x35x66
 Net Weight: kg 16

Didactic equipment - This Trainer studies the devices and the systems used for controlling and reducing the emissions of gasoline engines. The trainer illustrates the operation, the electric signals and all the sensors and the actuators that are used in modern automobiles to reduce the emission of noxious gases. The Trainer covers the following study and experiment subjects:

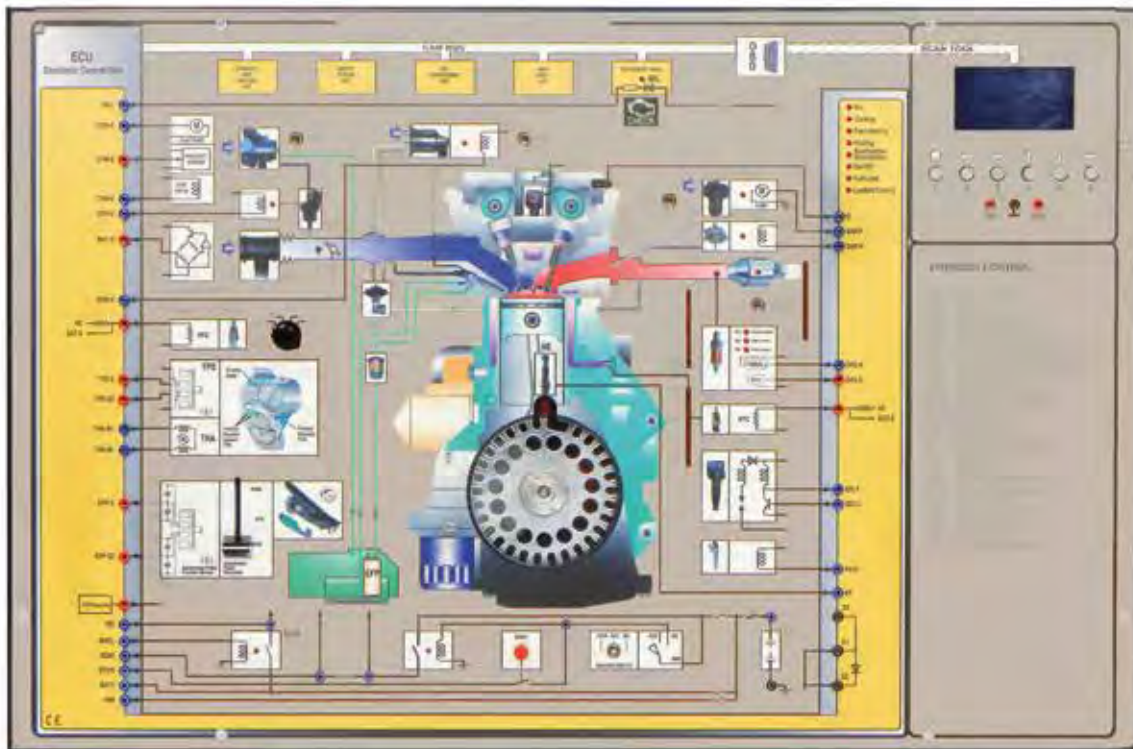
1. General structure of the management system for a gasoline engine
2. Composition of the exhaust gases in Otto cycle engines
3. Preparation and control of the fuel
4. Lambda regulation
5. Re-circulation of the exhaust gases, anti-evaporation of the fuel and thermal post-combustion
6. Sensors and actuators used in the systems for reducing the exhaust gas
7. Control unit (ECU) and CAN-BUS
8. Analysis of the electric signals of sensors and actuators
9. Troubleshooting with traditional instruments
10. Troubleshooting with OBD self-diagnosis

Approx. weight and dim.:

Cm: 62x23x43h

Net Weight: kg 10

Indicative picture for reference only



Main features

• Autonomous operation

The trainer is able to operate autonomously, without connection to PC. Moreover, it is provided with a USB interface to connect to a computer for data acquisition, graphic visualization, eTraining.

• Use of some real components

The trainer is provided with an electric motor, with phonic wheel and magnetic sensor for position and rotation speed. The electric motor 'simulates' the operation of the real engine (all the operations are made at a speed 10 times lower than the real one of the engine: between 80 and 600 rpm). This allows visualizing on LED the operation of the different devices: spark plugs, injectors, etc. On the LCD display the actual speeds are visualized (rpm from 800 to 6000). All the signals (on LED and terminals) is synchronized with the rotation of the phonic wheel and this makes 'real' the operation of the trainer.

• 'Real' signals

All the signals at the test points are real. They are equal in value, shape, time to the signals found in a real automobile.

• Graphic Display and Keyboard

The trainer uses a graphic display and a keyboard for the visualization of the interesting parameters during the operation and for the selection of quantities and functions to be visualized.

• 'Integrated' Instrumentation

The Trainer contains the Instruments that are normally used on the field for the operation of troubleshooting in automobiles, both the 'traditional' ones, such as the multimeter, and the 'new' ones, such as the ScanTool for the OBD diagnosis.

• Digital voltmeter

It allows performing all the voltage measurements on the system, without the need for external instrumentation.

• Digital oscilloscope

It allows checking the waveforms at all the Test Points of the system and to operate in the same modes of a real oscilloscope.

• Tester OBD-II (SCANTOOL)

It allows operating in the activities of fault finding in the same modes of a Scantool connected to an automobile through the OBD socket.

It is supplied with manual in English language.

VB 9148E COMMON-RAIL DIRECT INJECTION SIMULATOR FOR DIESEL ENGINE - electrical

This simulator allows the study on HDI (CDI - CR) injection systems for diesel engines.

It is composed of a screen panel with a mimic diagram which shows the entire analysis of the circuit of the fuel of the electrical/electronic control circuit and of all its components. The whole cycle of a common rail direct injection diesel engine is replicated on the panel.

The behaviour of components and circuits can be simulated on the basis of operating conditions that students and teachers can control directly on the panel or through computer. Teachers can keep continually under control the simulation by the measuring through analogue and digital devices so that the students can carry on working on the fault finding without any interruption.

The software is structured so to balance theory with practical experiences, troubleshooting and tests.



Indicative picture for reference only

Main components:

- Common rail with
 - electro-injectors
 - fuel pressure limiting valve
 - pressure sensor
- sensors for:
 - accelerator pedal position
 - over-supply pressure
 - air temperature
 - engine temperature
 - engine rpm
 - air mass
- electronic control board
- pneumatic actuator for the variable geometry turbine
- computerized workstation connected to the management system
- fuel tank with pre-filter
- high pressure electro-pump
- flow limiter

Approx. weight and dim.:

Cm: 104x35x66h

Net Weight: kg 16

VB 9149 COMMON RAIL DIESEL ENGINE MANAGEMENT SYSTEM

This demonstration panel shows the operating of the electronic, mechanic and hydraulic elements that constitute the control and fuel feed system of the contemporary CR/EDC ignition diesel engine. The trainer consists in a vertical panel with frame made of aluminum with insulated front panel and it is mounted on a movable support frame made of light profile; the front panel includes real components.

VB 9149

Indicative picture for reference only



The system is composed of two main modules:

- Common rail pump and injector control system for demonstration of its working and for the study of the electric and hydraulic parameters of the high-pressure pump and electro-injector control system. The module works autonomously or together with the Diesel Common Rail engine electronic control unit.
- Diesel Common Rail engine control unit, equipped with a microprocessor controller used for the demonstration of the high-pressure pump and electro-injector control system. The module only works with the pump and injector control module.

The fuel system enables presentation of the subassemblies' working and a change of the fuel dose. The measuring panel enables easy installation of the check meters for all the system sensors and working subassemblies.

The pump drive control allows the simulation of the full rotational speed range from the start phase to full capacity. The fault simulation console enables creating of breaks in chosen circuits and observing the reaction of the control system to the occurred position.

It is possible to install the diagnostic device to the relevant socket and observe the parameters of the system.

Complete with user manual that will allow teachers to develop their own experiments.

Approx. weight and dim.:

Cm: 100x51x179h

Net Weight: kg 150

Didactic equipment - This demonstration panel represents the working of the automatic brake power system ABS and the anti-slip regulation system ASR in motor vehicles with the aid of a microprocessor controller. It is manufactured to allow laboratory practices aiming at measurement of voltage and sequence of input signals and responses of the programmer to the dynamic changes of the above-mentioned input signals as well as testing of changes of pressure on hydraulic circuits.

The system facilitates the representation of normal states of programmer in the conditions of simulated driving, braking and braking with triggering of ABS/ASR (ABS/ABD) system response to extensive delays. Additionally, the functioning of the anti-skidding ASR system also is presented. The system allows also the demonstrating of reaction of a system to the most frequently observed types of failures, such as interruptions in wheel sensor circuits or in output circuits, i.e. electro-hydraulic valves or too small values of controlling signals (amplitudes of those signals).

The experimental stand facilitates the measurement of the following signals:

1. Characteristics of four different makes of speed of wheel rotation sensors.
2. Characteristics of voltage from the sensors in function of speed of rotation of toothed wheel rim.
3. Characteristics of the voltage in function of depth of gap for a given value of spinning velocity.
4. Depth of modulation of amplitude of sensor signal resulting from run-out of the toothed wheel rim in function of gap width.
5. Value of pressure in hydraulic circuits (in the brake master cylinder and after correction done by ABS/ASR system).

The trainer consists in a vertical panel with frame made of aluminum with insulated front panel and it is mounted on a movable support frame made of light profile; the front panel includes real components.

The station is powered from 230V/50Hz supply through a safety transformer and power supply with a output of 12V and constant current 40A.

To protect main circuits from damage, several safety devices is used; four fuses protect the following circuits:

main power supply circuit	25A
"15" supply circuit	10A
driver motors circuit	15A
break out box circuit	5A

The panel includes the following external elements:

- | | |
|--|--|
| <ol style="list-style-type: none"> 1. station power switch - ignition switch; 2. control lamps of power supply; 3. fuses for supply circuits; 4. potentiometer for regulation of spinning velocity of wheels; 5. drive transmission switch (RIGHT - BOTH - LEFT); 6. fault simulation switch- right front, 7. spinning velocity sensor - right front; 8. toothed wheel rim; 9. fault simulation switch- left front; 10. spinning velocity sensor - left front; 11. spinning velocity sensor - left rear; 12. spinning velocity sensor - right rear; 13. fault simulation switch- right rear, 14. fault simulation switch- left rear; 15. manometer in brake servo-motor regulation circuit - left front; 16. manometer in brake servo-motor regulation circuit - right front; 17. manometer in booster circuit; 18. wheel cylinder simulator; 19. manometer in brake servo-motor regulation circuit - right rear; | <ol style="list-style-type: none"> 20. manometer in brake servo-motor regulation circuit - left rear; 21. STOP light control lamp; 22. main circuit breaker; 23. transformer 220/24V 50Hz.; 24. STOP switch; 25. connector pipe for vacuum pump; 26. brake fluid supply tank; 27. manometer in brake master cylinder; 28. electro-hydraulic actuator; 29. system control unit; 30. diagnostic socket - OBDII; 31. schematic diagram with break out box, 32. system control light. |
|--|--|

The panel includes the following main components:

- No. 4 wheel rotational speed sensors
- toothed wheel rim electric engine control circuit
- ABS system programmer and numbering of programmer connection pins
- electro-hydraulic generator
- generator pump engine
- control lamp of ABS system failure
- measurement control desk
- relays board
- modular circuit breaker with residual current tripping
- brake pedal proximity sensor
- ABS system transmitter
- ABS pump transmitter
- electric engine for toothed wheel rims - left
- electric engine for toothed wheel rims - right
- switched-mode power supply 220V/14V
- switch-ignition switch of the demonstration station
- switches for simulation of interruptions in wheel speed sensor circuits
- LED diode - power voltage control lamp (circuit "15")
- LED diode - power voltage control lamp (circuit "50")
- LED indicator lamp simulating STOP light

The system allows the performing of the following experiments.

Functioning of the system:

- Functioning of the station for ABS system
- Functioning of the station for ASR system

Testing the ABS system with hand-held auto scanner:

- Fault simulation - Right front wheel sensor
- Faults simulation - Left front wheel sensor
- Faults simulation - Right rear wheel sensor
- Faults simulation - Left rear wheel sensor

This trainer is supplied with a noiseless compressor and is supplied with manual in English language.

Indicative picture for reference only



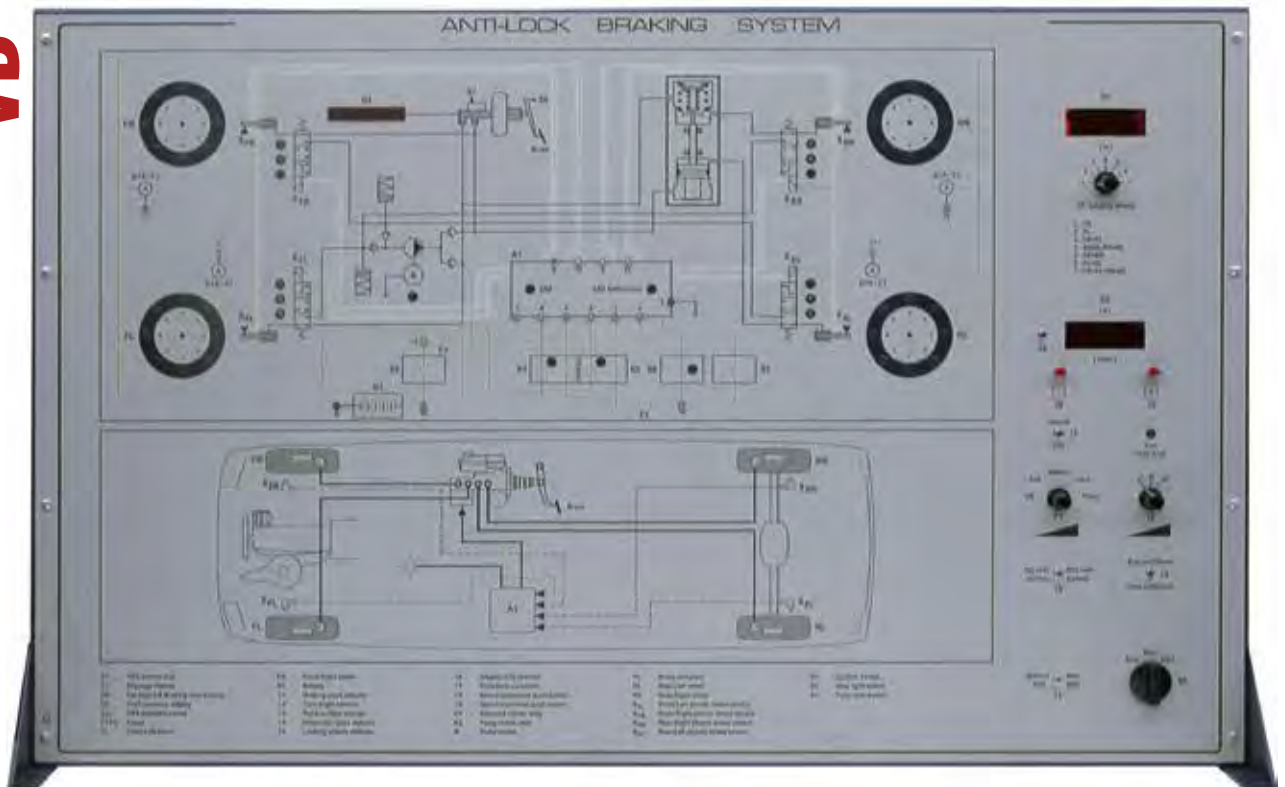
VB 12273

Approx. weight and dim.:

Cm: 140x160x185h

Net Weight: kg 150

This simulator has been created to show how modern car ABS systems operate.



Experiments :

- How ABS operates:
 - with one wheel speed sensor disconnected
 - when wheels are rotated at different speeds
 - when wheels are rotated at same speed
 - with destroyed hydraulic valve
 - with hydraulic valve stuck
 - with different relative speed turn of wheels
- How to detect:
 - Low fluid level
- How to measure:
 - Pressure during operation
 - Different control signals in the ABS system
- How Hydraulic ABS valve operates
- How brake system works:
 - when the electronic brake unit is disconnected
 - when there is leakage
- Self-diagnostic control
- Fault diagnosis process

An educational manual with a theoretical and practical study is supplied.

Approx. weight and dim.:

Cm: 104x35x66h
 Net Weight: kg 16

VB 12272 VEHICLE SENSOR SYSTEM

This demonstration panel enables learning in terms of combination, test and evaluation of the parameters of the vehicle system subassemblies. It is possible to configure it in different ways.

VB 12272

Indicative picture for reference only



The trainer includes the following systems:

1. Mass and volume air flow meters check system
2. MAP sensor check system
3. Knock sensor
4. Engine and air temperature sensor
5. Lambda sensor
6. Rotation speed active sensor
7. Speedometer sensor
8. Acceleration sensor
9. Rotation direction sensor
10. Set of the main vehicle system sensors
11. Differential pressure sensor
12. Oil pressure sensor
13. Fuel level sensor

Training includes the learning of the marks and graphics symbols of the sensors and testing the sensors with measuring instruments.

Complete with user manual that will allow teachers to develop their own experiments.

Approx. weight and dim.:

Cm: 104x35x66h

Net Weight: kg 16

VB 12271 SRS AIRBAG SYSTEM

This demonstration panel represents the AIRBAG system construction allowing evaluation of its parameters.

The experimental stand is manufactured to suit laboratory practices and it also demonstrates the reaction of a system for the most frequently observed types of failures, such as interruptions in circuits.

The trainer consists in a vertical panel with frame made of aluminum with insulated front panel and it is mounted on a movable support frame made of light profile; the front panel includes real components.



The trainer includes the following elements:

1. Ignition switch
2. Control lamps of power supply
3. Fuse unit
4. Schematic diagram with break out box
5. System control unit
6. Diagnostic socket – OBD II
7. Airbag assembly - driver
8. Airbag assembly - passenger
9. Airbag side assembly - driver
10. Airbag side assembly - passenger
11. Seat belt pretensioner
12. Seat belt pretensioner
13. Airbag crash sensor – driver
14. Airbag crash sensor - passenger
15. Schematic diagram of positioning of the elements inside of vehicle
16. Instrument panel

The experimental stand is powered from 220V/50/60Hz supply through a safety transformer and power supply with an output of 12V and constant current 15A.

To protect main circuits from damage, several safety devices are used.

Two fuses protects the following circuits from the top and the rectifier 12/24V- 10A stand feed system also.

Main power supply circuit 15A

Supply circuit 10A

The elements of a typical SRS system is:

- a system controller,
- a frontal airbag,
- a passenger's airbag,
- side airbags,
- tensioners and sensors of side crashes.

These elements enables diagnosing of the system.

- The fault simulation console enables the creation of breakdowns in selected circuits and the observation of the reaction of the control system to the occurred conditions.
- The used subassemblies enables the diagnosis of the SRS system and of the modern control panel where the SRS airbag system warning lamp is located.
- The panel is equipped with an engine diagnostic connector for the installing of the diagnostic device, which enables the reading and the erasing of breakdown codes and current parameters plus the control of the control panel's indicators and many other functions.

With this trainer supplied with relevant hand-held scanner, it is possible to perform the following fault simulation exercises:

1. Front Driver side, Airbag igniter test
2. Seat Belt tensioner igniter - Driver side test
3. Airbag igniter, Driver side test
4. Airbag igniter, Passenger side test
5. Seat Belt tensioner igniter, Passenger side test
6. Front Passenger side, Airbag igniter test
7. Crash Sensor side airbag, Driver side test
8. Crash Sensor side airbag, Passenger side test

This trainer is supplied with a noiseless compressor.

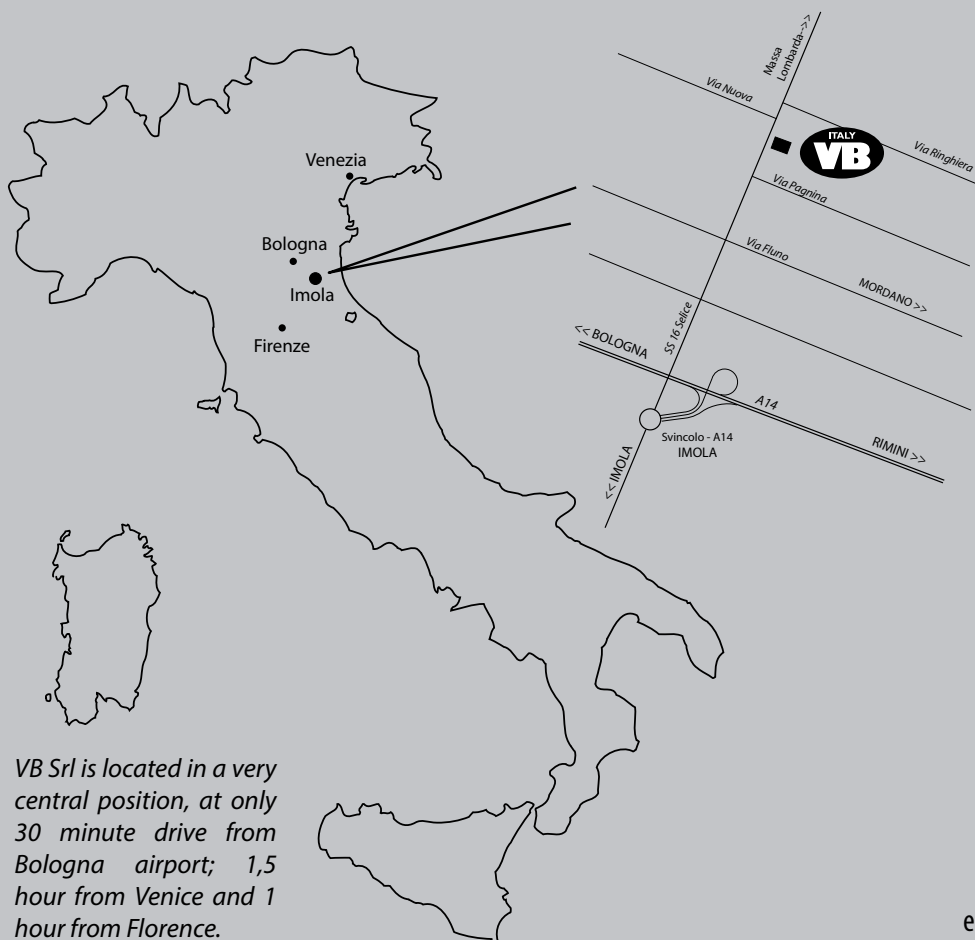
Approx. weight and dim.:

Cm: 100x51x180h
 Net Weight: kg 150

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VB Srl is located in a very central position, at only 30 minute drive from Bologna airport; 1,5 hour from Venice and 1 hour from Florence.

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