



Training Systems Australia
First in Vocational Training Equipment

Components & Accessories Cutaways



Pullman Learning Group

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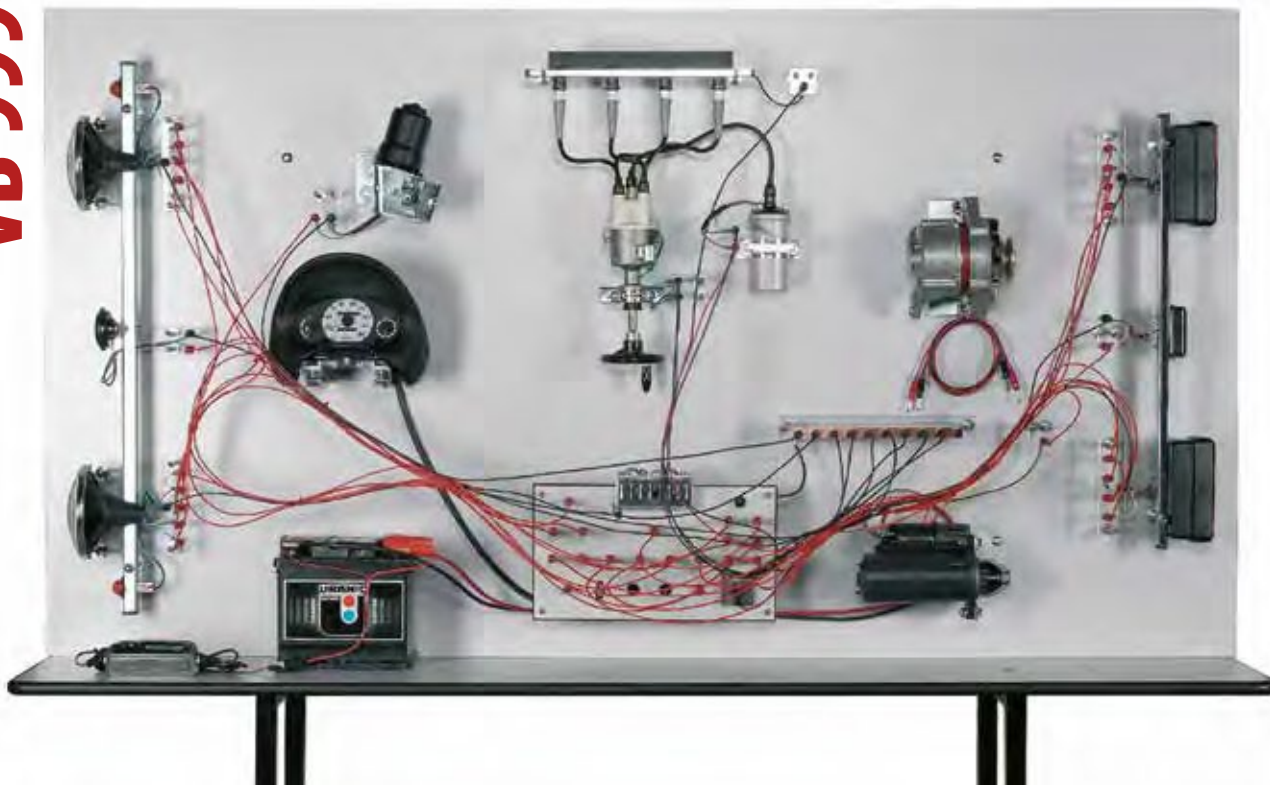
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VB 9990E TEACHING BENCH FOR CAR WITH WIRING TROUBLE-SHOOTING SYSTEM (on stand) CONVENTIONAL COIL IGNITION SYSTEM - electrical

VB 9991E TEACHING BENCH FOR CAR WITH WIRING TROUBLE-SHOOTING SYSTEM (on stand) ELECTRONIC IGNITION UNIT - electrical



Indicative picture for reference only

All main components of the electric system of a car are fixed together on a board and can be operated at 12 Volts.

The teacher can train the student to:

- assemble an electric system
- shoot the troubles (that have been produced previously on purpose) in the connections
- study the whole system by disassembling and assembling its various parts.

Approx. weight and dim.:

Cm	55x195x205h
Net Weight:	kg 90
Gross Weight:	kg 180

Main technical specifications:

- Front and rear lights
- Turn indicators
- Emergency
- Licence plate light
- Horn
- Windshield wiper motor
- Instrument panel
- Battery
- Distributor
- Battery ignition
- Spark plugs
- Coil
- Fuse box
- Starter motor
- Alternator
- Voltage regulator
- Wires with red couplings (positive) N°19
- Wires with black couplings (negative) N°10

VB 9992E ELECTRIC PANEL FOR LIGHTING AND ELECTRONIC IGNITION SYSTEM WITH ALTERNATOR (on stand with wheels) - electrical

Main technical specifications:

- Position lights
- Head lights
- Beam lights
- Indicators
- Rear fog-lights
- Stop lights
- Reverse light
- Work lights
- Relays
- Dashboard with lights
- Four spark plugs
- High tension coil
- Electronic distributor
- Battery with isolator
- *Electronic functioning Alternator with variable speed electric engine*
- Complete with volt-meter and ampere-meter
- Pin outs for tension values of each component

Indicative picture for reference only



Approx. weight and dim.:

Cm: 130x100x206h

Net weight : kg 110

Gross weight: Kg 220

VB 9992

VB 10000E COIL IGNITION UNIT (on base) - electrical

VB 10010E ELECTRONIC IGNITION UNIT (on base) - electrical

VB 10020E PREHEATING PLUG CIRCUIT OPERATING SYSTEM (on base) - electrical



Indicative picture for reference only

VB 10000E

A plastic-plated wooden base is the support of the main components of the coil ignition of a 4-stroke engine:

battery, spark coil, coil, spark plugs.

Rotating the flywheel, it shows the operation of the whole unit (the action of the platinum points and of the distributor can be observed through the section) and the spark flashing in the respective spark plugs is shown as well.

VB 10010E

Same as VB 10000E with electronic ignition.

VB 10020E

The glow plug preheating circuit of an indirect injection diesel engine is shown.

By pressing the proper push-button a transformer which is placed inside the battery makes the glow plug filament incandescent. 220V power supply.

VB 10000E - VB 10010E - VB 10020E

Approx. weight and dim.:

Cm: 70x25x55h

Net Weight: kg 10

Gross Weight: kg 15

VB 10030M IGNITION SYSTEM (on base) - manual

Representation of the ignition system composed of: distributor, spark coil and spark plug connected to each other by high voltage cables. The distributor is operated through a hand wheel and it is carefully sectioned to show the breaker points and the (centrifugal) automatic advance.

Approx. weight and dim.:

Cm: 30x20x15h

Net Weight: kg 2

Gross Weight: kg 5



VB 10030

VB 10040S BATTERY - static

VB 10050S COIL - static

VB 10060M DISTRIBUTOR - manual



VB 10040S



VB 10050S



VB 10060M

VB 10040 - VB 10050 - VB 10060

Indicative picture for reference only

VB 10070 - VB 10071

VB 10070M STARTER MOTOR FOR CARS (on base) - manual

VB 10071M STARTER MOTOR WITH REDUCTION GEARS FOR CARS (on base) - manual

Approx. weight and dim.:

Cm: 25x20x20h
Net Weight: kg 6
Gross Weight: kg 10



VB 10080M ALTERNATOR SINGLE-FLOW COOLING (on base) - manual

VB 10081M ALTERNATOR DOUBLE-FLOW COOLING (on base) - manual

Approx. weight and dim.:

Cm: 25x20x20h
Net Weight: kg 4
Gross Weight: kg 8



Indicative picture for reference only

VB 10090M DYNAMO - manual

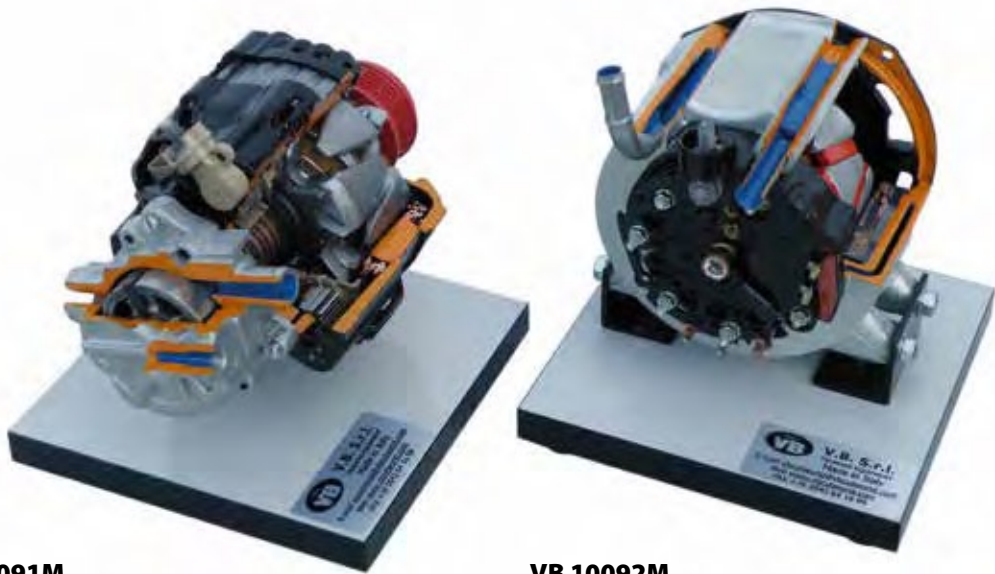
Approx. weight and dim.:

Cm: 25x20x20h
Net Weight: kg 6
Gross Weight: kg 10



VB 10091M VACUUM PUMP ALTERNATOR (on base) - manual

VB 10092M LIQUID-COOLED WINDINGLESS-ROTOR COMPACT ALTERNATOR (on base) - manual



VB 10091M

Approx. weight and dim.:

Cm: 20x20x25h
Net Weight: kg 8
Gross Weight: kg 15

VB 10092M

Approx. weight and dim.:

Cm: 20x20x25h
Net Weight: kg 8
Gross Weight: kg 15

VB 10095S THROTTLE JACKING DEVICE - static

VB 10096S EGR VALVE - static

VB 10097S AIR-FLOW SENSOR - static



VB 10095S

Approx. weight and dim.:

Cm: 15x10x10h
Net Weight: kg 1
Gross Weight: kg 1,5

VB 10096S

Approx. weight and dim.:

Cm: 20x10x10h
Net Weight: kg 1,5
Gross Weight: kg 2

VB 10097S

Approx. weight and dim.:

Cm: 10x10x10h
Net Weight: kg 1
Gross Weight: kg 1,5

VB 10091 - VB 10092

VB 10095 - VB 10096 - VB 10097

Indicative picture for reference only

VB 9900E IAW 59 F MULTI-POINT ELECTRONIC INJECTION SYSTEM - MPI (on stand with wheels) - electrical

The panel shows the functioning of an electronic injection system. It is possible to regulate the rpm from 0 to 2000 rpm by means of a pedal. It can simulate the air pressure sensor in the collector and the water temperature. It is possible to generate sensors and actuators faults disconnecting the relevant EOBD connections interface (standard with K line and 7 pins).



Main technical specifications:

- Fuel tank
- Electric fuel pump (N40)
- Multifunction valve
- Safety valve
- Fuel delivery pipe
- Electronic injection/ignition control unit (M10)
- Battery
- Ignition switch
- Inertia switch (I50)
- Engine compartment junction unit
- Climate control system
- Fuel vapour cut out solenoid valve (L10)
- Injection timing sensor (K47)
- Activated carbon filter
- Body Computer (diagnostic socket and Fiat CODE signal)
- Temperature/absolute pressure sensor (K44)
- Rpm sensor (K46)
- Spark plugs
- Coolant temperature sensor (K45)
- Injectors (N70)
- Throttle valve position sensor (K56)
- Idle speed actuator (N74)
- Fuel supply rail
- Air filter
- Ignition coils (A30)
- Lambda sensor (upstream) (K15)
- System failure warning light
- Rev. counter
- Catalytic converter
- Lambda sensor (downstream) (K16)

Approx. weight and dim.:

Cm	140x80x200h
Net Weight:	kg 96
Gross Weight:	kg 175

Indicative picture for reference only

VB 9901E SINGLE-POINT INJECTION SYSTEM - SPI (on stand with wheels) - electrical

This panel shows the functioning of an electronic injection system. It is possible to regulate the rpm from 0 to 2000 by means of a pedal. The IAW Weber-Marelli single point injection (SPI) system is a self-contained engine management system, which controls both the fuel injection and ignition. The fuel injection system comprises a fuel tank, an electric fuel pump, a fuel filter, fuel supply and returns lines, a throttle body with an integral electronic fuel injector, and an Electronic Control Unit (ECU) together with its associated sensors, actuators and wiring.

VB 9901

Indicative picture for reference only



Main technical specifications:

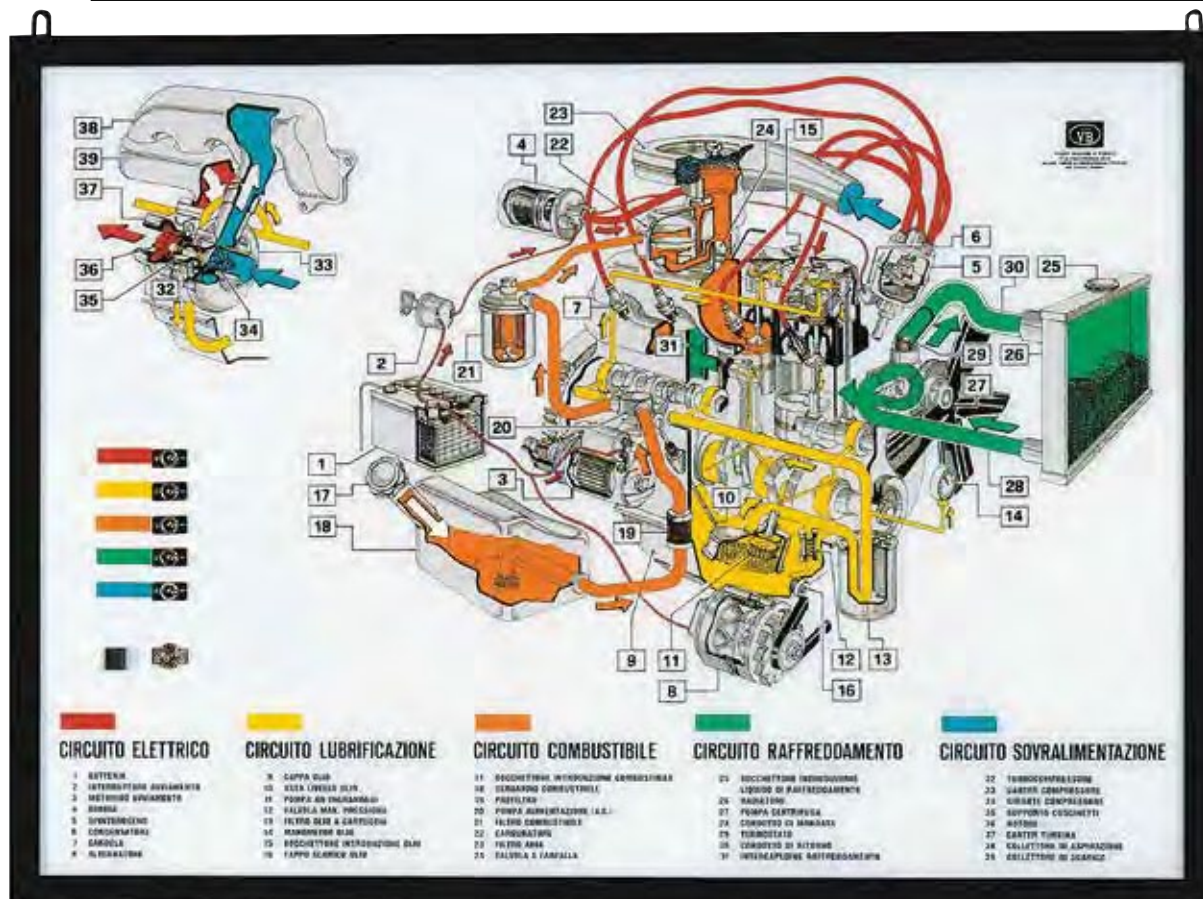
- Fuel tank
- Fuel pump
- Fuel pressure regulator
- Injector
- Fuel vapour trap
- Idle stepper motor
- Absolute pressure sensor
- Injection/ignition ECU
- Throttle position sensor
- Engine coolant temperature sensor
- Intake air temperature sensor
- Injection/ignition dual relay
- Ignition coils
- Rpm and TDC sensor
- Spark plugs
- Diagnostic socket
- EVAP solenoid
- Lambda /oxygen sensor

Approx. weight and dim.:

Cm	140x70x210h
Net Weight:	kg 96
Gross Weight:	kg 170

VB 5500E ENGINE VIDEO SYSTEM (on panel) - electrical

VB 5510E ENGINE VIDEO SYSTEM (on stand with wheels) - electrical



Luminous training panel with silk-screened plexiglass front painted with different colours to better show the most important functions inside an internal combustion system.

The ignition, lubrication, carburetting, cooling and supercharging system (different colours) are shown separately by some lamps flashing one after the other to give the movement impression.

Perfect operation of the panel is got by means of an electric board.

VB 5510E

Same as VB 5500E but on a wheeled stand.

ENGLISH / FRENCH TEST AVAILABLE UPON REQUEST
VB 5500E

VB 5500E

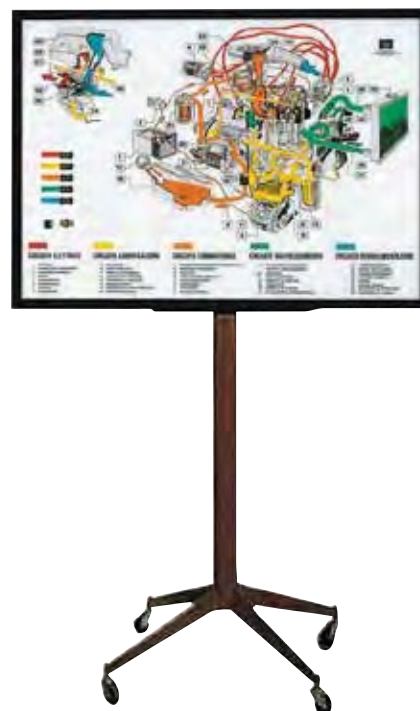
Approx. weight and dim.:

Cm: 110x80x10h
Net Weight: kg 10
Gross Weight: kg 20

VB 5510E

Approx. weight and dim.:

Cm: 110x80x50h
Net Weight: kg 20
Gross Weight: kg 30



Indicative picture for reference only

VB 10310S VERTICAL TWIN CARBURETTOR (on base) - static

VB 10320S SINGLE-BODY CARBURETTOR (on base) - static

VB 10330S VACUUM CARBURETTOR (on base) - static

VB 10340S HORIZONTAL TWIN CARBURETTOR (on base) - static



VB 10310S



VB 10320S



VB 10330S



VB 10340S

Approx. weight and dim.:

Cm: 25x30x30h

Net Weight: kg 1

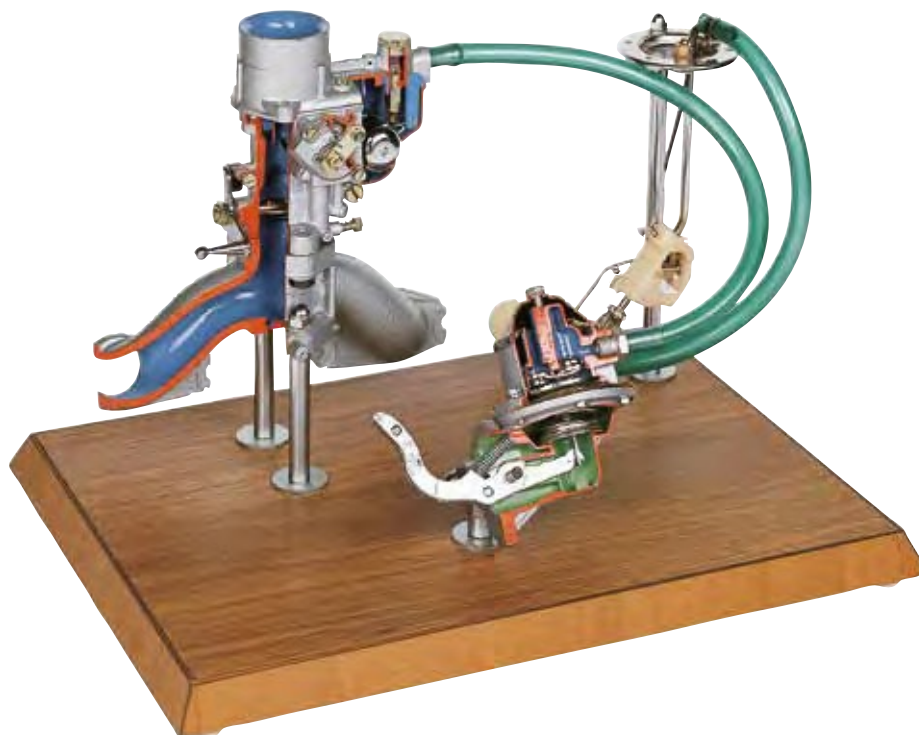
Gross Weight: kg 2

VB 10310 - VB 10320 - VB 10330 - VB 10340

Indicative picture for reference only

VB 10350

VB 10350S PETROL ENGINE FEEDING CIRCUIT (on base) - static



Main technical specifications:

- Float with fuel level gauge (tank)
- Diaphragm pump
- Single-body carburettor
- Inlet manifold

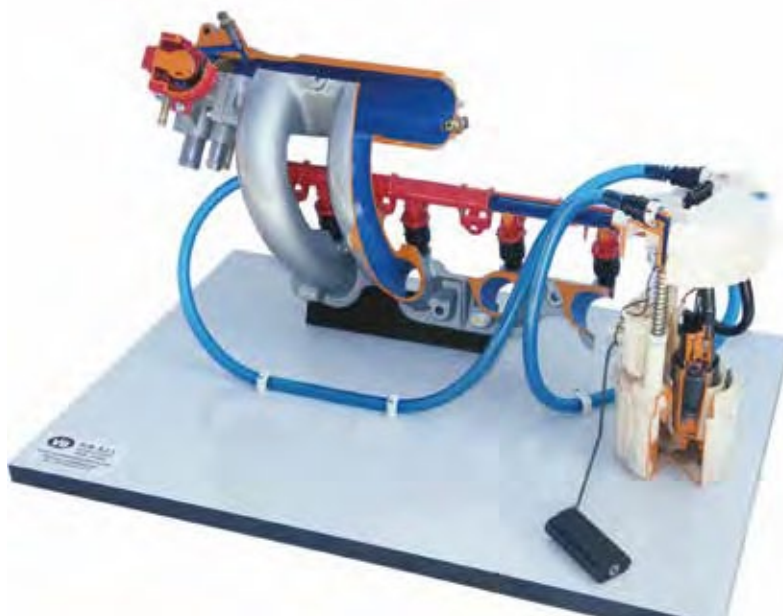
Approx. weight and dim.:

Cm:	40x30x30h
Net Weight:	kg 3
Gross Weight:	kg 6

Indicative picture for reference only

VB 10355

VB 10355S ELECTRONIC INJECTION FEEDING CIRCUIT (on base) - static



Main technical specifications:

- Suction manifold with electro-injector
- Air capacity meter
- Fuel manifold to the injectors
- Butterfly body
- Accelerator position switch
- Submersed electric petrol pump
- Fuel lever meter

Section of an electronic injection feeding circuit, 4 cylinders multi-point

Approx. weight and dim.:

Cm:	40x60x40h
Net Weight:	kg 8
Gross Weight:	kg 12

VB 10360S MONO-JETRONIC THROTTLE BODY (on base) - static

Accurate section of a throttle body fitted to Mono-jetronic engines with the following visible parts:

- Pressure control
- Bottom feed type injector
- Air and water temperature sensor
- Potentiometer
- Idling control actuator

Approx. weight and dim.:

Cm: 25x25x25h

Net Weight: kg 3

Gross Weight: kg 6



VB 10360

VB 10361S PETROL ELECTRO-INJECTOR (on base) - static

Cutaway model of an electro injector for multipoint injection engines.

The following parts are shown:

- Injector body
- Needle
- Magnetic core
- Winding
- Electric connector



VB 10361

VB 10365S SPARK PLUG (on base) - static

Internal combustion engine spark plug cutaway model.

The following part are shown:

- Spark plug body
- Ceramic insulator
- Earth electrode



VB 10365

Indicative picture for reference only

VB 10366

VB 10366S 2 VALVE DESMO SOHC ENGINE HEAD (on base) - static



Accurate section of a Ducati two-valve desmo engine head.

Approx. weight and dim.:

Cm:	25x20x20h
Net Weight:	kg 7
Gross Weight:	kg 7

Indicative picture for reference only

VB 10367

VB 10367S 3 VALVE OHC ENGINE HEAD (on base) - static



Accurate section of FIAT three-valve engine head with hydraulic tappet.

Approx. weight and dim.:

Cm:	20x20x15h
Net Weight:	kg 3,5
Gross Weight:	kg 6

VB 10368S TWIN VALVE OHC ENGINE HEAD (on base) - static



Accurate section of a BMW twin-valve per cylinder engine head.

Approx. weight and dim.:

Cm: 25x20x20h

Net Weight: kg 5

Gross Weight: kg 8

VB 10369S 4 VALVE DOHC ENGINE HEAD (on base) - static



Top-of-the-range Volkswagen engine head, with 4 valves per cylinder and hydraulic tappet adjustment.

Approx. weight and dim.:

Cm: 25x20x20h

Net Weight: kg 5

Gross Weight: kg 8

VB 10368

VB 10369

Indicative picture for reference only

VB 10525

VB 10525S LPG TIMED SEQUENTIAL INJECTION FOR ELECTRONIC INJECTION ENGINES (wall-mounted) - static

LPG timed sequential injection for petrol engine with multi-point electronic injection, complete with the following components:

- E.C.U.
- Injection rail
- L.P.G. solenoid valve
- Reducer – vaporizer
- Pressure sensor
- Pressure stabilizer
- Switch commutator
- Nozzles for manifold
- Water temperature sensor
- Gas temperature sensor
- Refuelling valve
- Level indicator



The panel is equipped with nomenclature table.

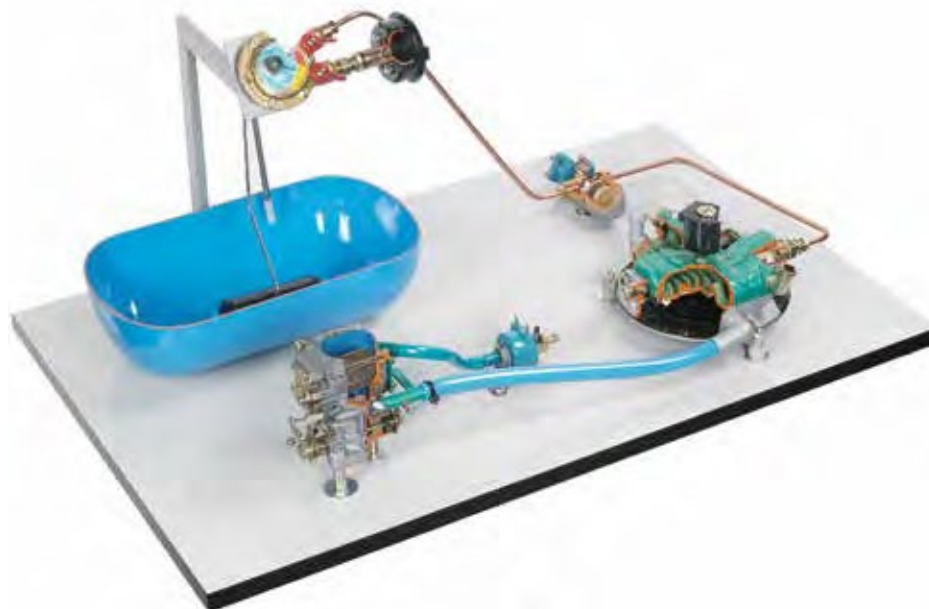
Approx. weight and dim.:

Cm	70x120x15h
Net Weight:	kg 16
Gross Weight:	kg 30

Indicative picture for reference only

VB 10520

VB 10520S LPG FUEL CIRCUIT FOR CARBURETTOR ENGINES (on base) - static



Main technical specifications:

- Filler Plug
- LPG tank
- Level gauge
- LPG solenoid valve
- Petrol solenoid valve
- Vaporiser reduction gear
- Carburettor

Layout of a car LPG fuel system with single-body type carburettor for educational purposes.

Approx. weight and dim.:

Cm:	80x50x40h
Net Weight:	kg 12
Gross Weight:	kg 20

VB 10104M CP1 BOSCH HIGH PRESSURE PUMP (on base) - manual

Radial-piston pump for common rail engine, pressure 1100-1350 bar, fuel lubrication, three plungers.



Approx. weight and dim.:

Cm: 25x20x20h

Net Weight: kg 5

Gross Weight: kg 8

VB 10106M CP3 BOSCH HIGH-PRESSURE PUMP (on base) - manual

Radial-piston pump for common rail engine, pressure 1600 bar, fuel lubrication, three plungers.



Approx. weight and dim.:

Cm: 25x20x25h

Net Weight: kg 5

Gross Weight: kg 8

VB 10108M CP4 BOSCH HIGH-PRESSURE PUMP (on base) - manual

Radial-piston pump for common rail engine, pressure 2000 bar, fuel lubrication, two plungers.



Approx. weight and dim.:

Cm: 25x20x25h

Net Weight: kg 4

Gross Weight: kg 8

Indicative picture for reference only

VB 10104

VB 10106

VB 10108



Indicative picture for reference only

Reproduction of the fuel circuit of a diesel engine, complete with:

- 2 direct injectors;
- 2 indirect injectors;
- fuel filter;
- in-line injection pump with cylinder;
- low pressure gauge (pump circuit);
- high pressure gauge (injector circuit);
- tank;
- feeding pump;
- high and low pressure delivery and return pipings.

The injection pump, operates by means of a 220 V geared motor, sends the fuel to the injectors which atomize it in special glass bulbs.

In this way the fuel injection and atomization can be displayed.

The unit is also suitable for idling tests and demonstrations with simulated breakdowns.

Approx. weight and dim.:

Cm	80x80x160h
Net Weight:	kg 55
Gross Weight:	kg 90



Indicative picture for reference only

Reproduction of the fuel circuit of a diesel engine, complete with:

- 2 direct injectors;
- 2 indirect injectors;
- fuel filter;
- Bosch VE rotary injection pump;
- high pressure gauge (injector circuit);
- tank;
- feeding pump;
- high and low pressure delivery and return pipings.

The injection pump, operates by means of a 220 V geared motor, sends the fuel to the injectors which atomize it in special glass bulbs.

In this way the fuel injection and atomization can be displayed.

The unit is also suitable for idling tests and demonstrations with simulated breakdowns.

Approx. weight and dim.:

Cm	80x80x160h
Net Weight:	kg 50
Gross Weight:	kg 85

VB 10300

VB 10300M DIESEL COMMON-RAIL (on base) - manual



Accurate cross-section of the high pressure (1600 bar) fuel system known as Common-rail. This circuit consists of a radial piston pressure pump, one delivery manifold and an electro-injector, all connected via high-pressure hoses.

It is operated manually.

Approx. weight and dim.:

Cm:	50x20x30h
Net Weight:	kg 8
Gross Weight:	kg 15

Indicative picture for reference only

VB 10305

VB 10305S DIESEL ELECTRO-INJECTOR WITH SOLENOID VALVE (on base) - static



Section of electro injector for modern diesel engines. The main interesting components from the educational point of view are displayed.

Approx. weight and dim.:

Cm:	10x25x10h
Net Weight:	kg 0,5
Gross Weight:	kg 1

VB 10110S INJECTOR PUMP (on base) - static

Accurate section of a unit injector system for commercial vehicles, where it is possible to observe:

- electromagnetic valve HD
- pumping element
- duster, etc.



Approx. weight and dim.:

Cm: 40x20x10h

Net Weight: kg 3

Gross Weight: kg 4

VB 10112S PIEZO IN-LINE INJECTOR (on base) - static



Approx. weight and dim.:

Cm: 25x12x10h

Net Weight: kg 1

Gross Weight: kg 2

Indicative picture for reference only

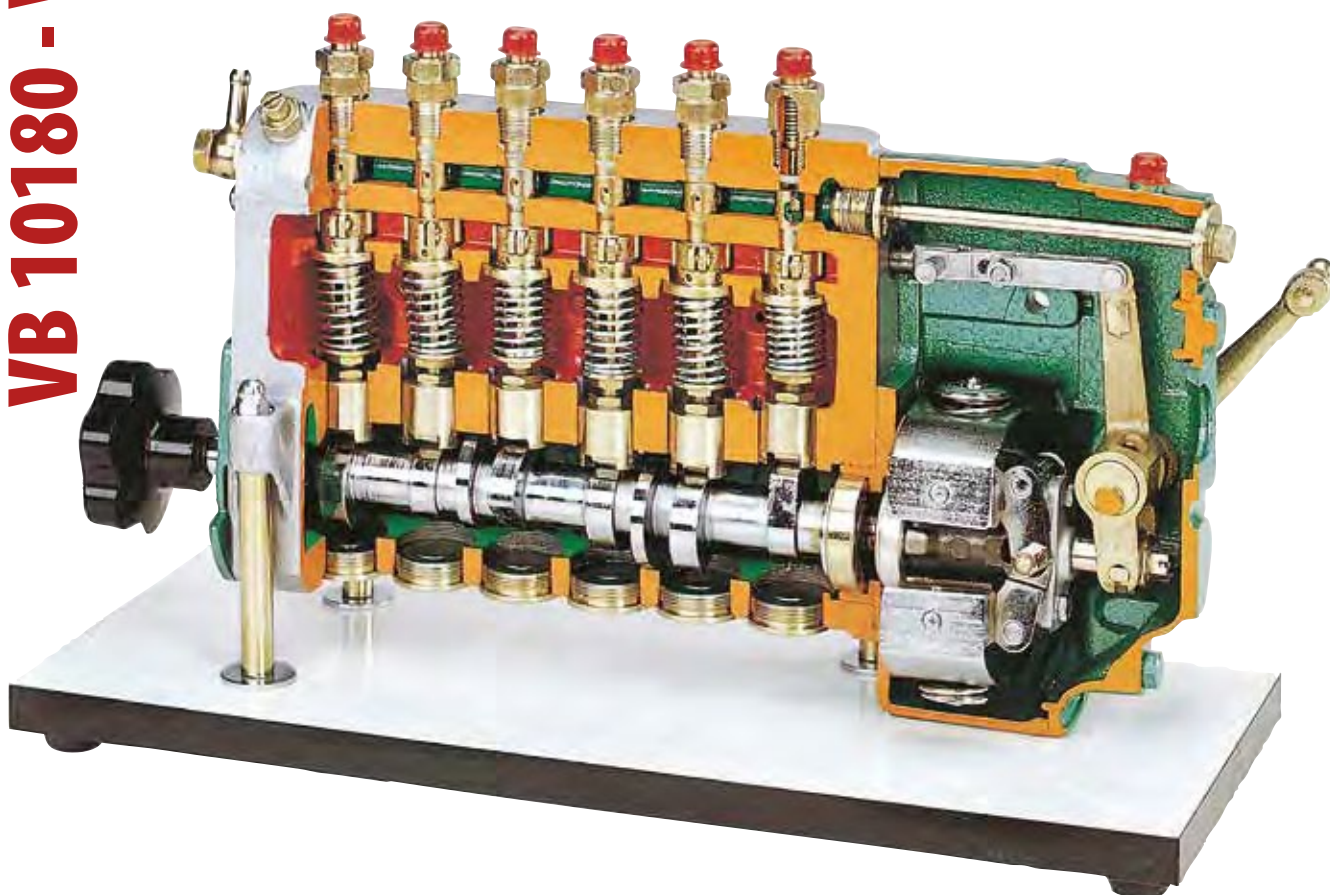
VB 10110

VB 10112

VB 10180 - VB 10181

VB 10180M INJECTION PUMP WITH 6 IN-LINE CYLINDERS AND CENTRIFUGAL GOVERNOR (on base) - manual

VB 10181M INJECTION PUMP WITH 4 IN-LINE CYLINDERS AND CENTRIFUGAL GOVERNOR (on base) - manual



Indicative picture for reference only

VB 10180M

Main technical specifications:

- Small piston;
- Cylinder;
- Sector gear,
- Rock,
- Camshaft,
- Check valve,
- Centrifugal governor

Operated manually through a crank handle.

VB 10180M

Approx. weight and dim.:

Cm: 25x55x45h
Net Weight: kg 16
Gross Weight: kg 20

VB 10181M

Main technical specifications:

- Small piston;
- Cylinder;
- Sector gear,
- Rock,
- Camshaft,
- Check valve,
- Centrifugal governor

Operated manually through a crank handle.

VB 10181M

Approx. weight and dim.:

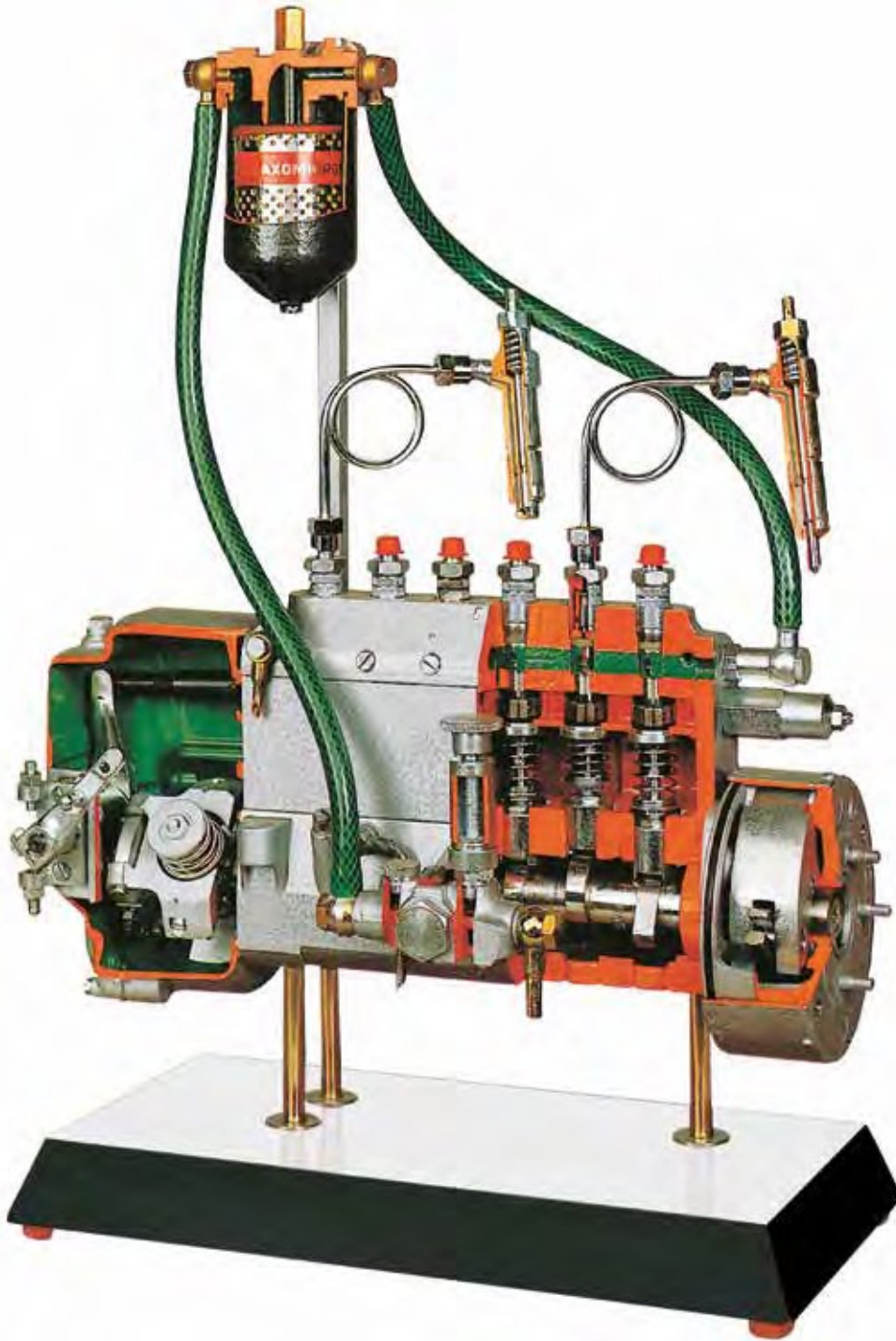
Cm: 20x40x30h
Net Weight: kg 9
Gross Weight: kg 15

VB 10200M INJECTION PUMP WITH 6 IN-LINE CYLINDERS (on base) - manual

VB 10210M INJECTION PUMP WITH 6 IN-LINE CYLINDERS (on stand with wheels) - manual

VB 10200 - VB 10210

Indicative picture for reference only



VB 10200M

Main technical specifications:

- Small piston;
- Cylinder;
- Sector gear,
- Rock,
- Camshaft,
- Check valve,
- Centrifugal governor
- 2 injectors of different type
- Fuel filter
- Fuel pump

Operated manually through a crank handle.

VB 10210M

Same as VB 10200M but on stand with wheels.

Approx. weight and dim.:

Cm: 60x30x60h
Net Weight: kg 24
Gross Weight: kg 35

VB 10210M

Approx. weight and dim.:

Cm: 80x60x50h
Net Weight: kg 31
Gross Weight: kg 45

VB 10220

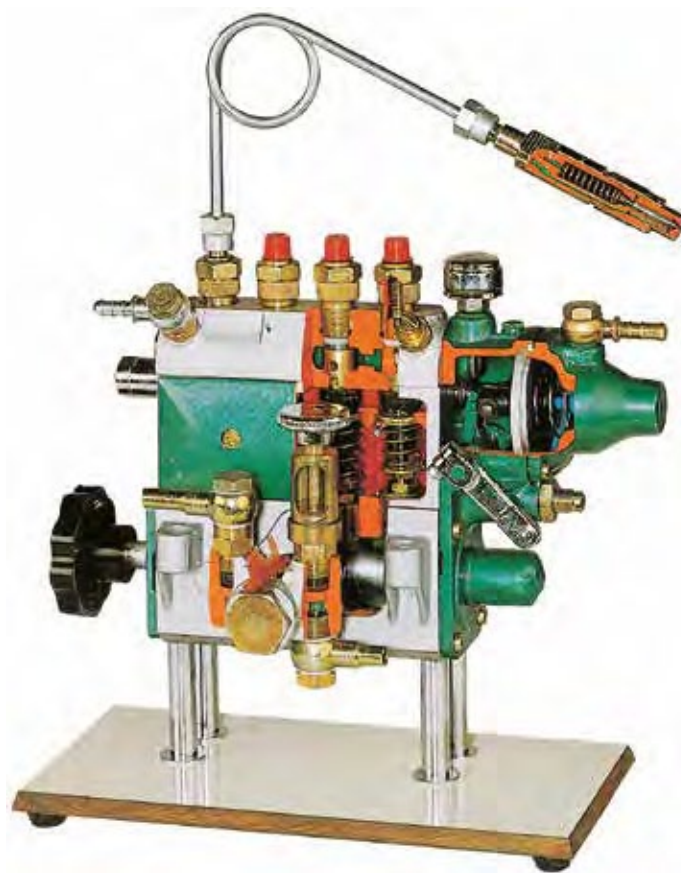
VB 10220M BOSCH INJECTION PUMP WITH 4 IN-LINE CYLINDERS + PNEUMATIC SPEED GOVERNOR (on base) - manual

Accurate section of a pump suitable for medium displacement engine (FIAT, Mercedes) with pneumatic speed governor (rock rod or acceleration rod controlled by a diaphragm connected to the suction collector). It is provided with a feeding pump.

Operated manually through a crank handle.

Approx. weight and dim.:

Cm:	20x30x30h
Net Weight:	kg 7
Gross Weight:	kg 10



VB 10230

VB 10230M SINGLE-CYLINDER INJECTION PUMP (on base) - manual

Alternative single-cylinder injection pump model complete with one injector.

Approx. weight and dim.:

Cm:	20x20x30h
Net Weight:	kg 3
Gross Weight:	kg 5

Operated manually through a crank handle.

These cutaway models are carefully sectioned for training purposes, professionally painted with different colours to better differentiate the various parts, cross-sections, lubricating circuits, fuel system. Many parts have been chromium, plated and galvanized for a longer life.



Indicative picture for reference only

VB 10240M BOSCH ROTARY INJECTION PUMP (on base) - manual



The most popular rotating pump (Bosch VE) has been sectioned for training purposes to show all its operating parts.

The distributor during the gas oil pumping and distribution phase, the transfer pump, the speed governor, the automatic advance regulator and the fuel circuit are clearly displayed.

It is supplied complete with an indirect injector.

Operated manually through a crank handle.

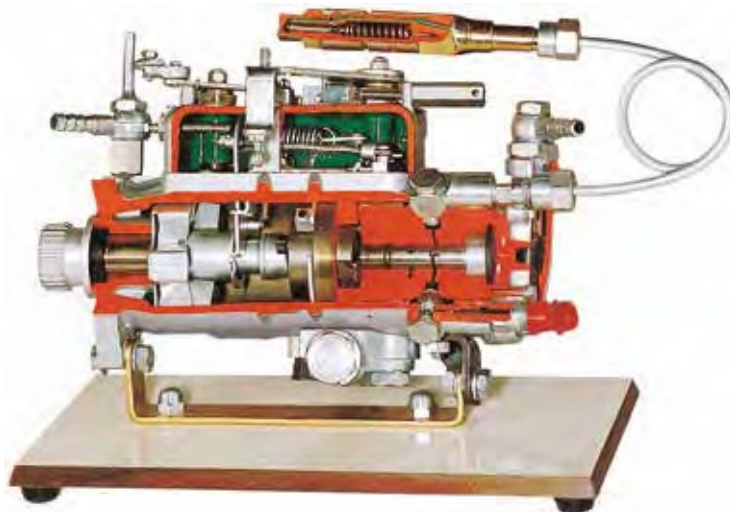
Approx. weight and dim.:

Cm: 30x15x30h

Net Weight: kg 5

Gross Weight: kg 8

VB 10250M CAV DPA-DPS ROTARY INJECTION PUMP (on base) - manual



Careful section of a CAV rotary pump for training purposes, showing all its operating parts.

The transfer pump, the speed governor, the automatic advance regulator, the hydraulic sensor device, the fuel circuit and the pumping small piston are clearly shown. It is supplied complete with an indirect injector.

Operated manually through a crank handle.

Approx. weight and dim.:

Cm: 30x20x20h

Net Weight: kg 6

Gross Weight: kg 8

These cutaway models are carefully sectioned for training purposes, professionally painted with different colours to better differentiate the various parts, cross-sections, lubricating circuits, fuel system. Many parts have been chromium, plated and galvanized for a longer life.

VB 10240

VB 10250

VB 10260

VB 10260M CAV DPC INJECTION PUMP (on base) - manual

*This is an evolution of the CAV DPA pump.
It has been cross sectioned according to the same criteria to show its main parts.
It is provided with an indirect injector.*

It is operated manually.

Approx. weight and dim.:

Cm:	30x20x20h
Net Weight:	kg 6
Gross Weight:	kg 9



VB 10270

VB 10270M RADIAL PISTON INJECTION PUMP WITH ELECTRONIC ADJUSTER VP 44 BOSCH DISTRIBUTOR (on base) - manual

Approx. weight and dim.:

Cm:	40x20x30h
Net Weight:	kg 9
Gross Weight:	kg 15

Main technical specification:

- Vane pump
- Electric fan
- Distributor plunger
- Injection phase
- Electronic control unit, etc.



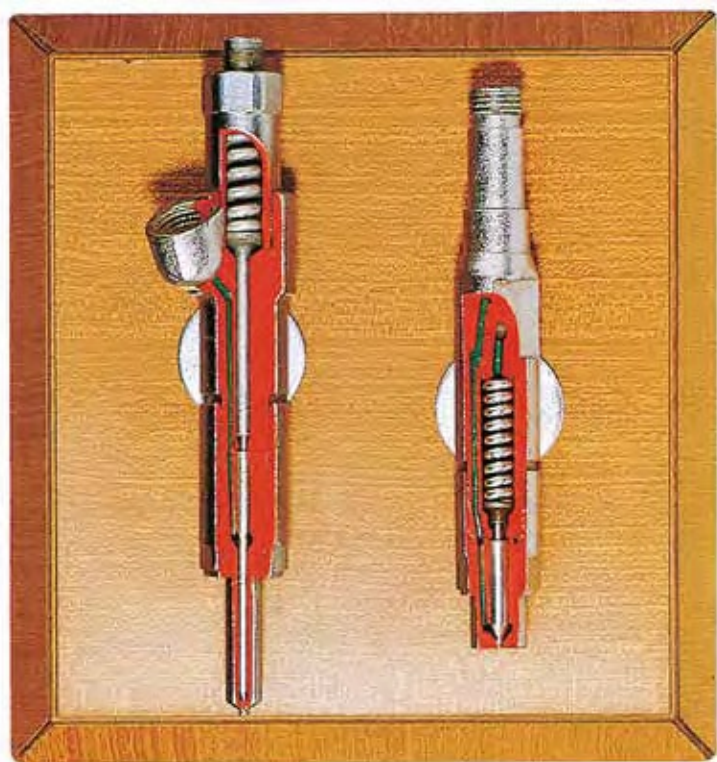
Modern high-pressure rotary injection pump (approx. 1500 bars).

It is operated manually.

These cutaway models are carefully sectioned for training purposes, professionally painted with different colours to better differentiate the various parts, cross-sections, lubricating circuits, fuel system. Many parts have been chromium, plated and galvanized for a longer life.

Indicative picture for reference only

VB 10280S INJECTORS (on base) - static



Careful section of two different injectors (direct and indirect injection type) showing their internal parts and relevant operation.

Approx. weight and dim.:

Cm: 30x20x15h

Net Weight: kg 1

VB 10280

VB 10500S DIRECT INJECTION PISTON - static

VB 10510S INDIRECT INJECTION PISTON - static



VB 10500S

Approx. weight and dim.:

Cm: 18x18x35h

Net Weight: kg 5

Gross Weight: kg 7

VB 10510S

Approx. weight and dim.:

Cm: 12x12x22h

Net Weight: kg 2.5

Gross Weight: kg 4

VB 10500 - VB 10510

VB 10290M DIESEL PUMPING ELEMENT - manual



Giant model (scale 5:1) of the pumping element of a Diesel engine. It has been carefully cross sectioned to show the cylinder inlet hole and the helical spline on the piston.

It is operated manually.

Approx. weight and dim.:

Cm: 30x6x6h

Net Weight: kg 1

VB 10290

VB 10430

VB 10430M TURBOSUPERCHARGER WITH WASTE-GATE VALVE (on base) - manual

Approx. weight and dim.:

Cm: 30x30x30h
Net Weight: kg 6
Gross Weight: kg 8

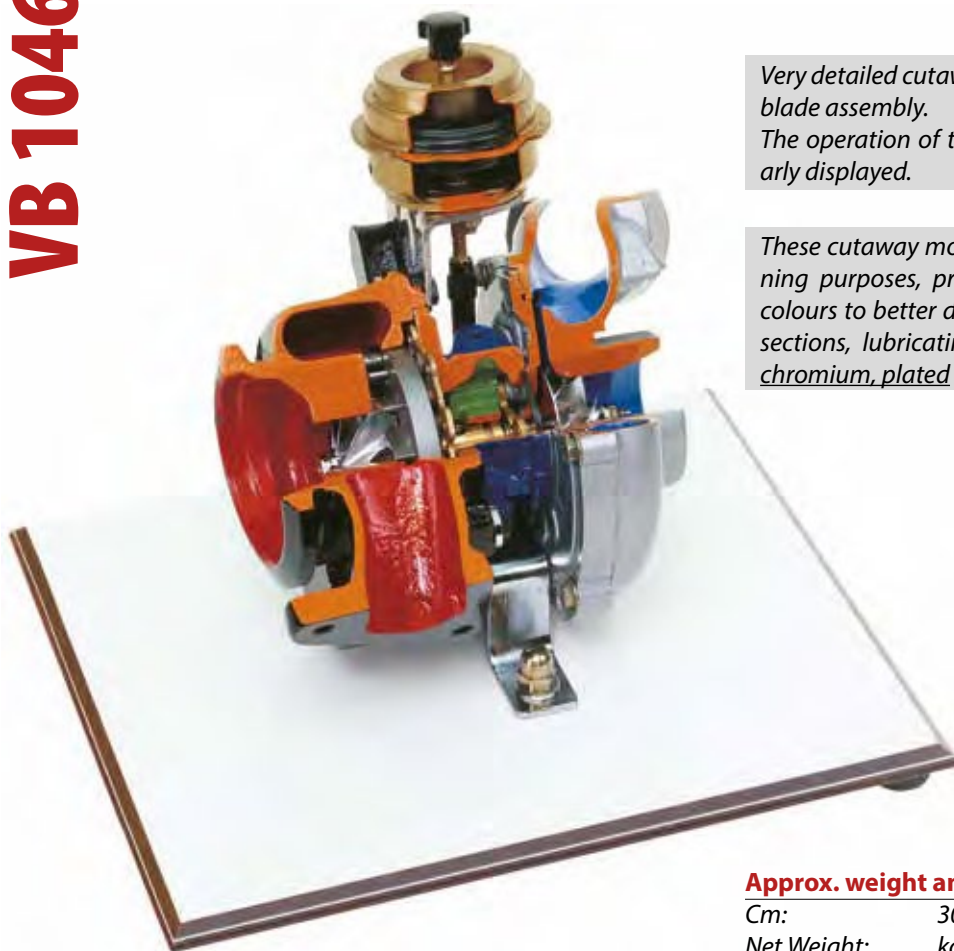


VB 10460

VB 10460M VARIABLE GEOMETRY TURBOSUPERCHARGER (on base) - manual

Very detailed cutaway item, with clearly visible moving blade assembly. The operation of the variable geometry system is clearly displayed.

These cutaway models are carefully sectioned for training purposes, professionally painted with different colours to better differentiate the various parts, cross-sections, lubricating circuits. Many parts have been chromium, plated and galvanized for a longer life.



Approx. weight and dim.:

Cm: 30x25x30h
Net Weight: kg 6
Gross Weight: kg 10

Indicative picture for reference only

VB 10441M TURBO-CHARGER WITH VARIABLE GEOMETRY + ELECTRICAL CONTROL MOTOR (on base) - manual



Approx. weight and dim.:

Cm:	50x20x25h
Net Weight:	kg 7
Gross Weight:	kg 10

VB 10450M TURBO-INTERCOOLER (on base) - manual

VB 10451M TURBO-INTERCOOLER WITH VARIABLE GEOMETRY (on base) - manual

VB 10450M

Accurate section of a supercharging unit for Diesel or petrol motorcars.

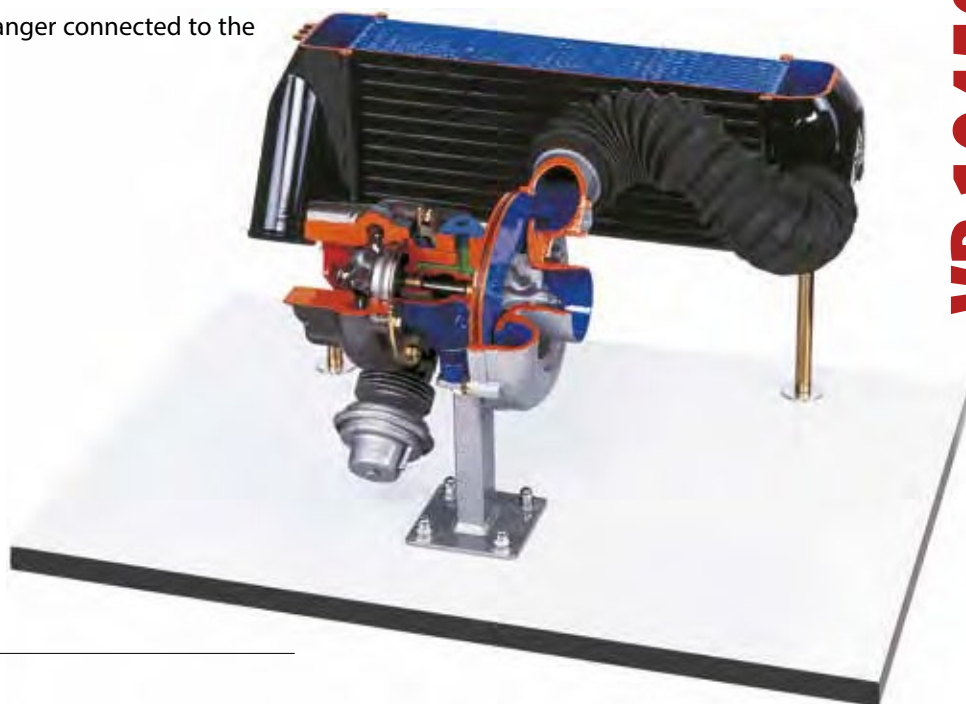
The cross-section of the turbo-supercharger highlights the following:

- Exhaust gas turbine
- Waste-gate valve
- Centrifugal compressor
- Lubricating circuit
- Cutaway air-air heat exchanger connected to the turbo-supercharger.

VB 10451M

Accurate cross-section of the turbo-supercharger highlighting the:

- Exhaust gas turbine with variable geometry
- Centrifugal compressor
- Lubricating circuit
- Cutaway air-air heat exchanger connected to the turbo-supercharger.



VB 10450M - VB 10451M

Approx. weight and dim.:

Cm:	60x40x40h
Net Weight:	kg 12
Gross Weight:	kg 18

Indicative picture for reference only

VB 10441

VB 10450 - VB 10451

Approx. weight and dim.:

: 50x20x25h
 Weight: kg 9
 Gross Weight: kg 15

The image shows a mechanical component, possibly a pump or motor, with a blue housing and internal gears. The component is mounted on a grey base plate. A label on the base plate reads:

V&S S.r.l.
 Via S. Maria 10/12
 40138 Bologna (BO) Italy
 Tel. 051/2641111
 Fax 051/2641112
 Email: info@v-s.it

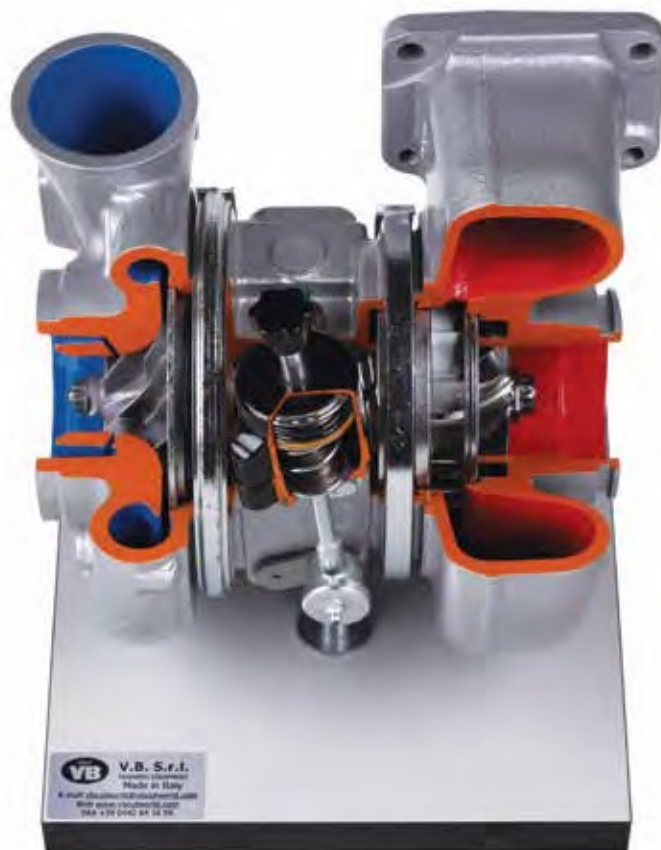
Accurate section of a sequential turbo showing one turbocharger for lower engine speeds and a second turbocharger at higher engine speeds.



Cm: 55x35x40h
Net Weight: kg 8
Gross Weight: kg 15

Indicative picture for reference only

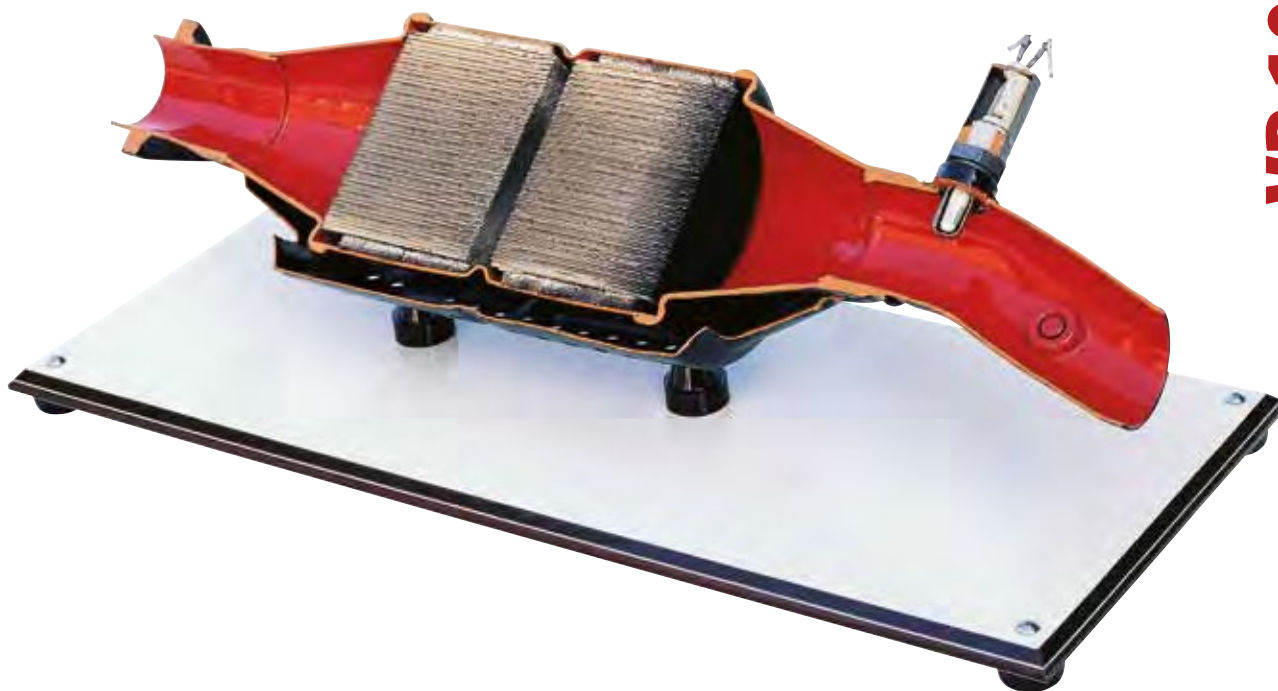
VB 10453S TURBOCHARGER WITH VARIABLE GEOMETRY HOLSET FOR TRUCKS
(on base) - static



Approx. weight and dim.:

Cm: 45x45x45h
Net Weight: kg 26
Gross Weight: kg 35

VB 10630S CATALYTIC SILENCER WITH LAMBDA PROBE (on base) - static



Approx. weight and dim.:

Cm: 50x20x20h
Net Weight: kg 3
Gross Weight: kg 6
Packing

VB 10453

VB 10630

Indicative picture for reference only

VB 10370S PISTON PUMP (on base) - static

VB 10380S ELECTRICAL FUEL PUMP (on base) - static

VB 10385S MECHANICAL FUEL PUMP (on base) - static

VB 10390M WATER PUMP WITH RADIATOR (on base) - manual

VB 10400M OIL PUMP WITH FILTER (on base) - manual



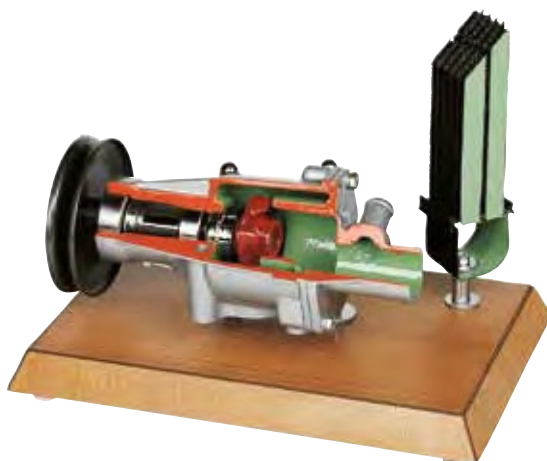
VB 10370S



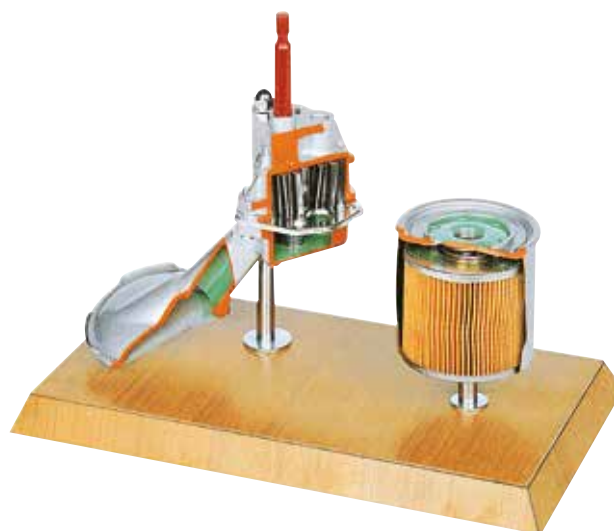
VB 10380S



VB 10385S



VB 10390M



VB 10400M

Indicative picture for reference only

VB 10370S - VB 10380S - VB 10385S

Approx. weight and dim.:

Cm: 15x15x15h

Net Weight: kg 0,5

Gross Weight: kg 1,0

VB 10390M - VB 10400M

Approx. weight and dim.:

Cm: 30x20x30h

Net Weight: kg 3

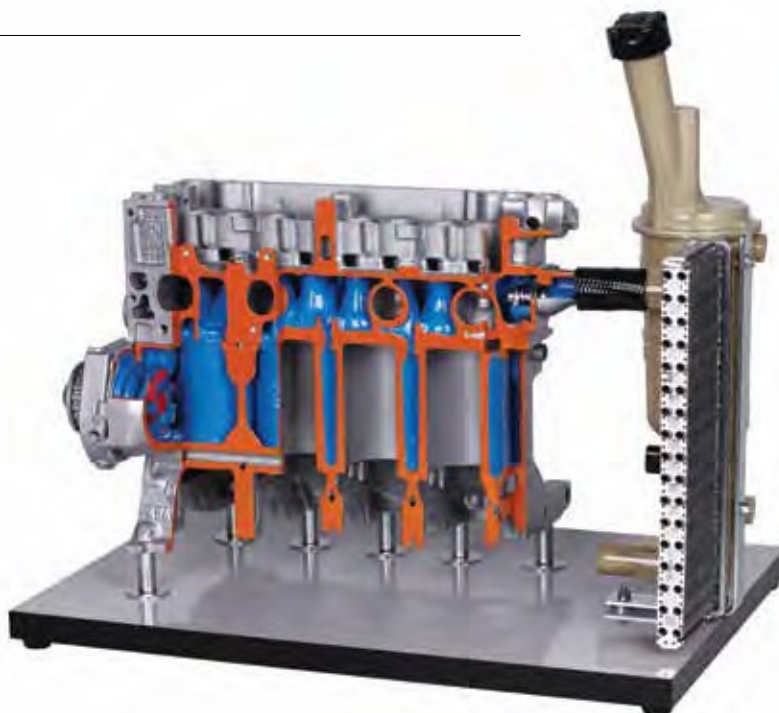
Gross Weight: kg 6

VB10401S ENGINE COOLING SYSTEM (on base) - static

Complete Cooling System unit

Main technical specifications:

- Block-head canalisation
- Water pump
- Thermostatic valve
- Water temperature bulb
- Expansion tank
- Radiator
- Connecting pipe



Approx. weight and dim.:

Cm: 50x70x75h

Net weight : kg 26

Gross weight: Kg 35

VB 10402S DUAL MASS FLYWHEEL(on base) - static

Sectioned to highlight the two different damped masses by means of internal springs



Approx. weight and dim.:

Cm: 35x35x20h

Net Weight: kg 16

Gross Weight: kg 21

VB 10401

VB 10402

Indicative picture for reference only

VB 10403

VB 10403S LUBRICATION CIRCUIT WITH GEAR ROTOR TYPE PUMP (on base) - static

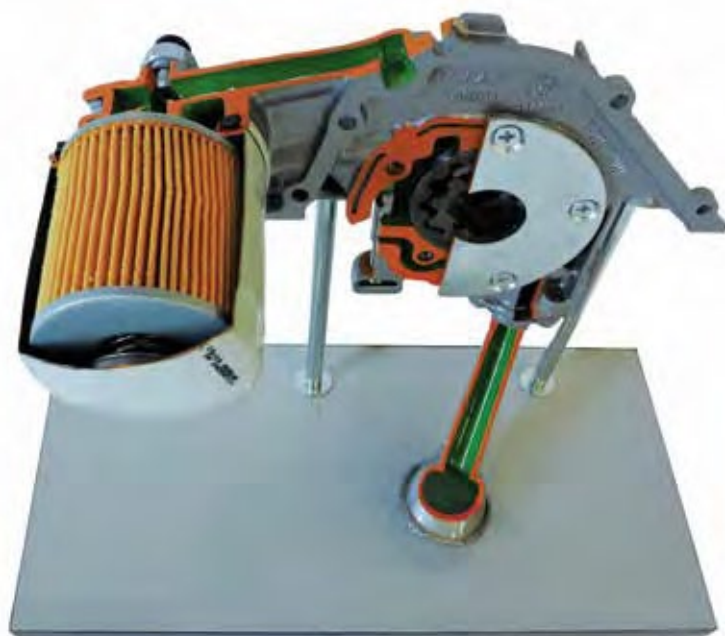
Oil pump apparatus with internal gears complete with oil filter.

Main technical specification:

- Pressure bulb
- Pressure relief valve
- Suction device with small net

Approx. weight and dim.:

Cm	30x40x40h
Net Weight:	kg 2,5
Gross Weight:	kg 4



Indicative picture for reference only

VB 10404

VB 10404M FLANGE OIL PUMP COMPLETE WITH PRESSURE RELIEF VALVE (on base) - manual



Approx. weight and dim.:

Cm:	20x20x30h
Net Weight:	kg 4
Gross Weight:	kg 6

VB 10405M ROTOR OIL PUMP (on base) - manual

VB 10410M VANE PUMP (on base) - manual

VB 10420M GEAR PUMP (on base) - manual

Indicative picture for reference only



VB 10405M



VB 10420M

VB 10405M

Approx. weight and dim.:

Cm: 25x20x30h

Net Weight: kg 1

Gross Weight: kg 2

VB 10410M

Approx. weight and dim.:

Cm: 15x15x20h

Net Weight: kg 1

Gross Weight: kg 2

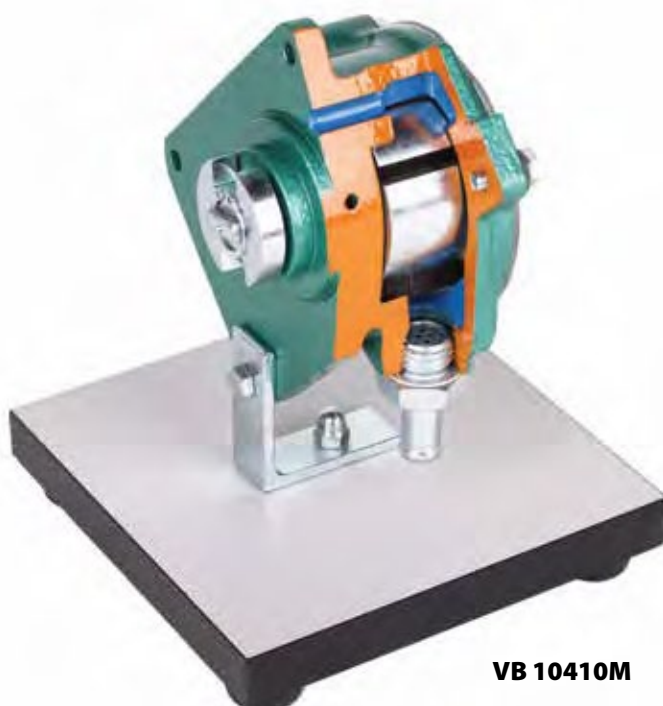
VB 10420M

Approx. weight and dim.:

Cm: 25x20x30h

Net Weight: kg 1

Gross Weight: kg 2



VB 10410M

VB 10405 - VB 10410 - VB 10420

VB 9130E CAR AIR CONDITIONING SYSTEM (on stand with wheels) - electrical

After market unit mounted on an auto chassis. It is ideal for training in the operation, maintenance, repair and troubleshooting.

Main technical features:

- Max. power 2 Kw
- Cooling liquid 400gt Freon R134a
- Piston compressor
- Condenser
- Dehydrating filter
- Pressure switch
- Expansion valve
- Evaporation unit
- Resistor
- Thermostat
- Troubleshooting device for simulation of 4 faults
- With nomenclature table



Indicative picture for reference only

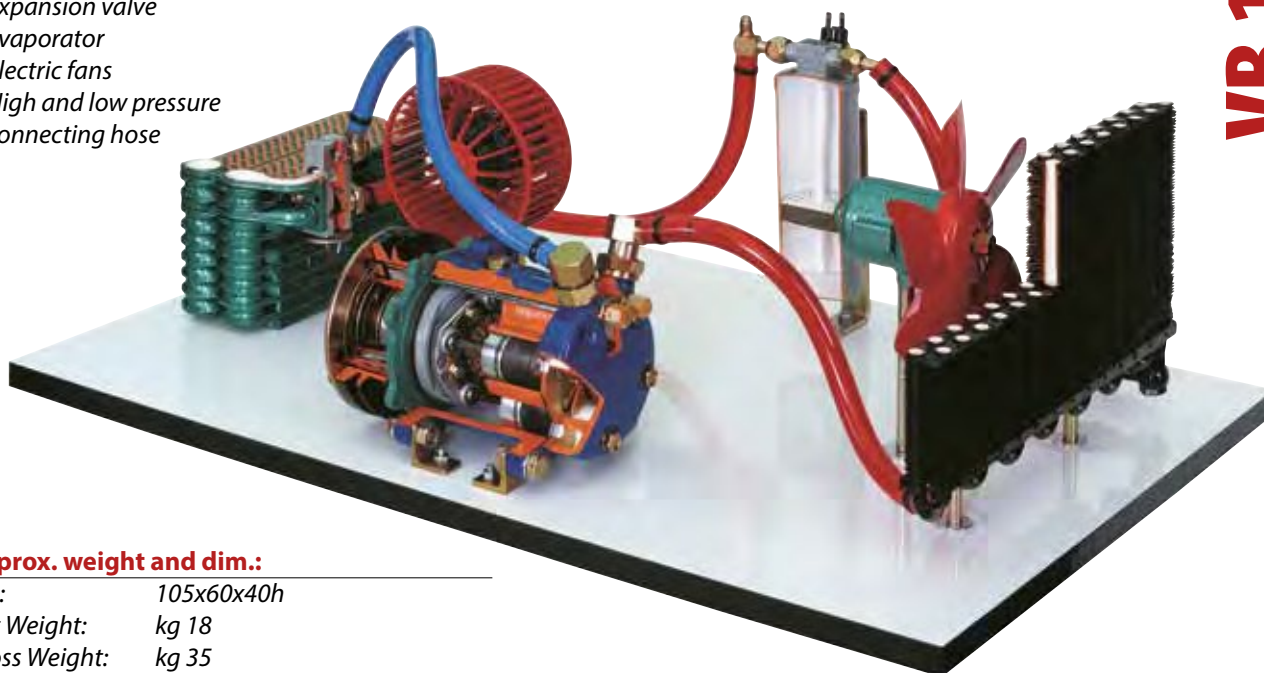
It operates at 220V by means of a mono-phase 1,5 Kw motor.

Approx. weight and dim.:

Cm:	105x75x130h
Net Weight:	kg 70
Gross Weight:	kg 120

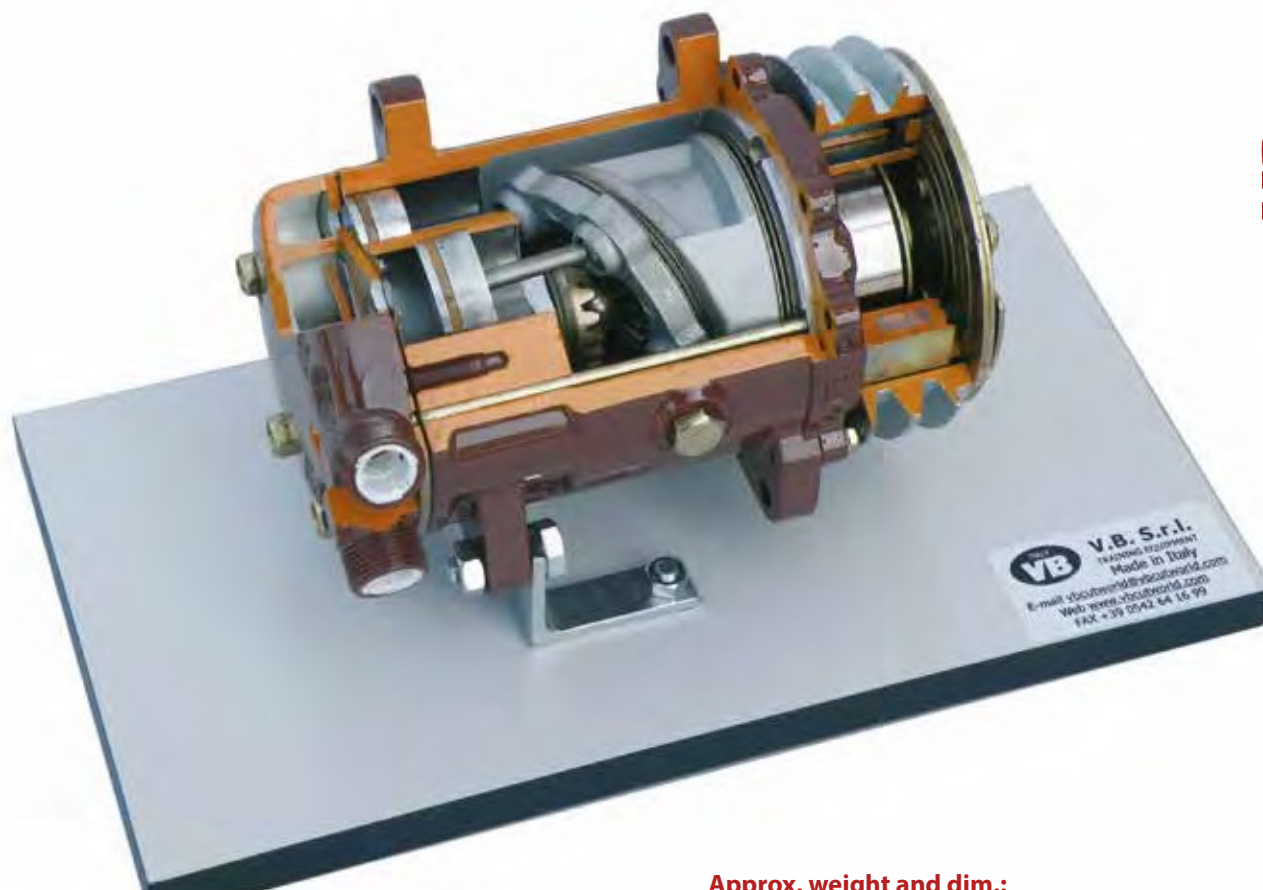
VB 10650

- Radial piston compressor
- Condenser
- Filter
- Expansion valve
- Evaporator
- Electric fans
- High and low pressure connecting hose



Cm: 105x60x40h
Net Weight: kg 18
Gross Weight: kg 35

VB 10651M AXIAL ALTERNATIVE COMPRESSOR WITH SIMPLE EFFECT PISTON
(on base) - manual



Cm:	30x20x20h
Net Weight:	kg 8
Gross Weight:	kg 13

VB 10651

VB 10652 - VB 10653

VB 10652M AXIAL ALTERNATIVE COMPRESSOR WITH VARIABLE DISPLACEMENT
(on base) - manual

VB 10653M AXIAL ALTERNATIVE COMPRESSOR WITH DOUBLE EFFECT PISTON
(on base) - manual



VB 10652M

Approx. weight and dim.:

Cm: 20x20x20h
Net Weight: kg 7
Gross Weight: kg 12

VB 10653M

Approx. weight and dim.:

Cm: 20x20x20h
Net Weight: kg 7
Gross Weight: kg 12

Indicative picture for reference only

VB 10654 - VB 10655

VB 10654M ROTARY SCROLL COMPRESSOR (on base) - manual

VB 10655M VANE COMPRESSOR (on base) - manual



VB 10654M

Approx. weight and dim.:

Cm: 20x20x20h
Net Weight: kg 6
Gross Weight: kg 12

VB 10655M

Approx. weight and dim.:

Cm: 20x20x20h
Net Weight: kg 7
Gross Weight: kg 12

VB 10700M STEERING BOX WITH HOURGLASS SCREW (on base) - manual

VB 10710M SEGMENTAL STEERING (on base) - manual

VB 10720M STEERING BOX WITH RE-CIRCULATING BALL SYSTEM (on base) - manual

VB 10730M RACK STEERING BOX (on base) - manual

Indicative picture for reference only



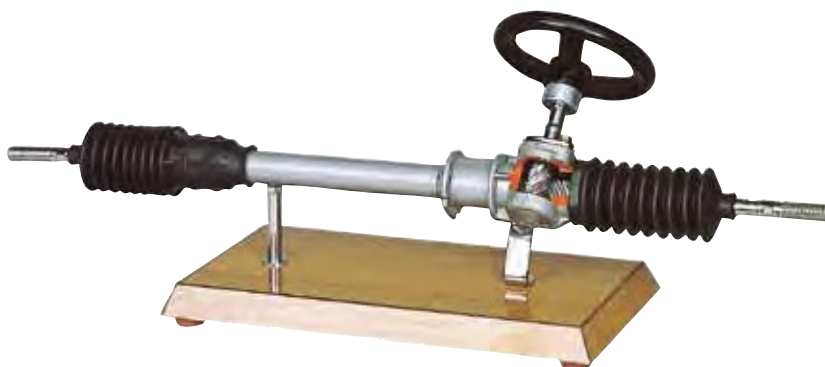
VB 10700M



VB 10710M



VB 10720M



VB 10730M

VB 10700M

Approx. weight and dim.:

Cm: 30x40x40h
Net Weight: kg 7
Gross Weight: kg 10

VB 10710M

Approx. weight and dim.:

Cm: 30x25x20h
Net Weight: kg 4
Gross Weight: kg 6

VB 10720M

Approx. weight and dim.:

Cm: 25x35x40h
Net Weight: kg 8
Gross Weight: kg 11

VB 10730M

Approx. weight and dim.:

Cm: 70x25x30h
Net Weight: kg 4
Gross Weight: kg 6

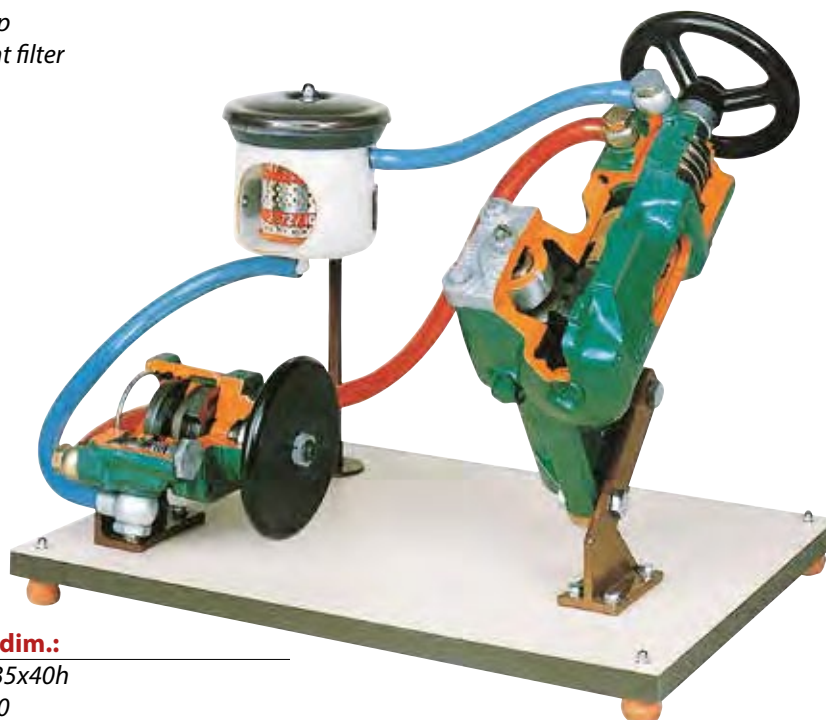
VB 10700 - VB 10710 - VB 10720 - VB 10730

VB 10750M POWER STEERING WITH RE-CIRCULATING BALL SYSTEM (on base) - manual

Main technical specifications:

- Ball type steering box
- Hydraulic vane pump
- Oil tank with relevant filter
- Connecting pipes

Operated through a hand wheel.



Approx. weight and dim.:

Cm:	50x35x40h
Net Weight:	kg 20
Gross Weight:	kg 35

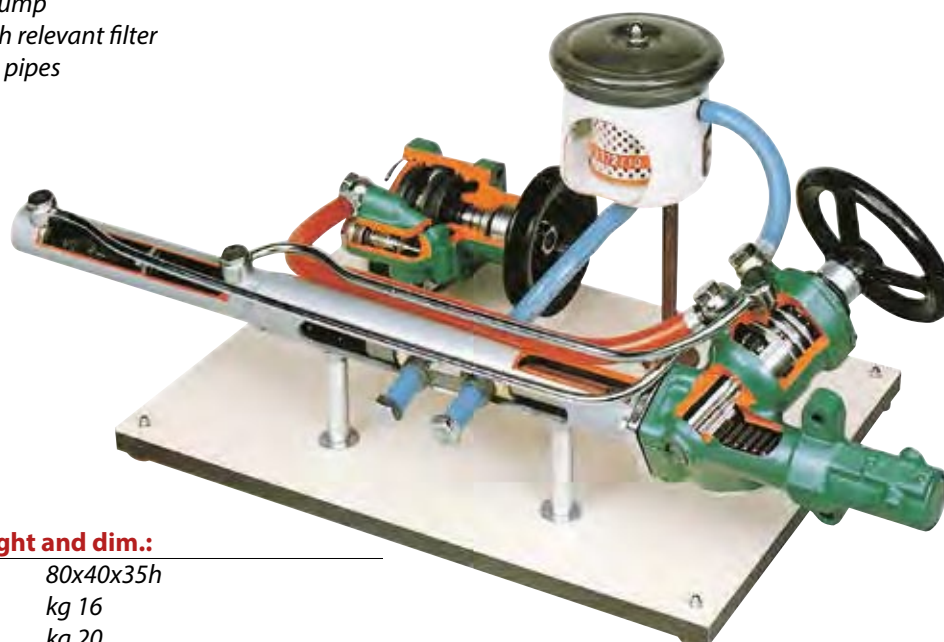
Indicative picture for reference only

VB 10760M RACK POWER STEERING (on base) - manual

Main technical specifications:

- Rack type steering box
- Hydraulic pump
- Oil tank with relevant filter
- Connecting pipes

Operated through a hand wheel.



Approx. weight and dim.:

Cm:	80x40x35h
Net Weight:	kg 16
Gross Weight:	kg 20

These cutaway models are carefully sectioned for training purposes, professionally painted with different colours to better differentiate the various parts, cross-sections. Many parts have been chromium, plated and galvanized for a longer life.

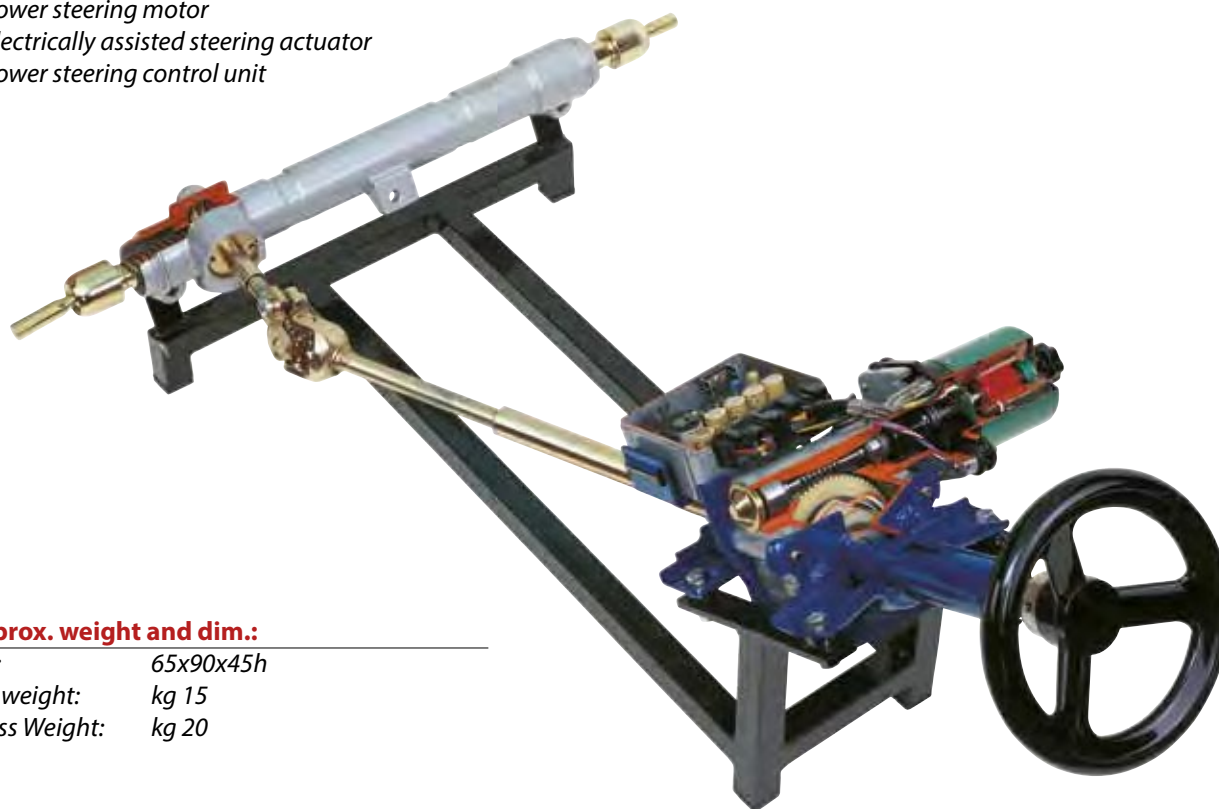
VB 10780M ELECTRICALLY ASSISTED STEERING (on a table stand) - manual

Main technical specifications:

- Rack steering box
- Power steering motor
- Electrically assisted steering actuator
- Power steering control unit

Operated manually by means of a wheel fitted to the electric motor.

VB 10780

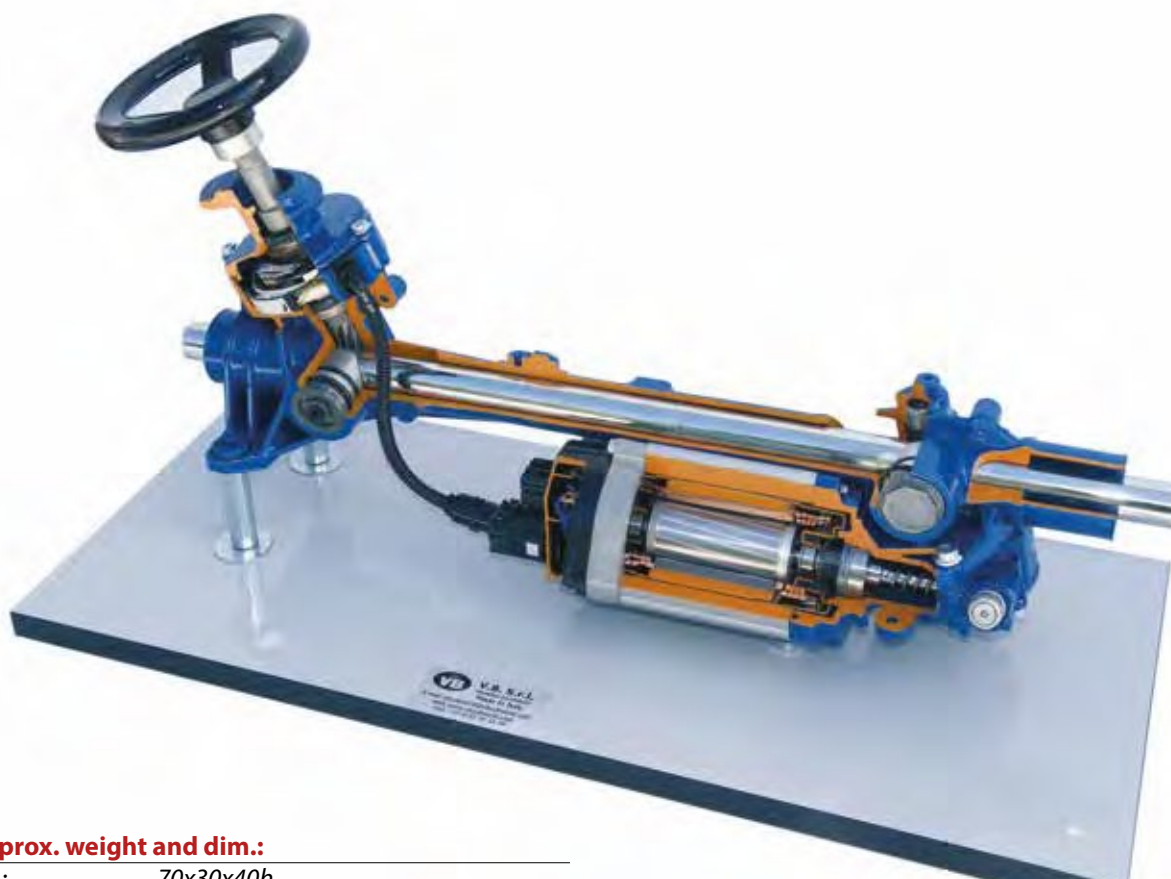


Approx. weight and dim.:

Cm: 65x90x45h
Net weight: kg 15
Gross Weight: kg 20

VB 10782M ELECTRICAL RACK AND PINION STEERING (on base) - manual

VB 10782



Approx. weight and dim.:

Cm: 70x30x40h
Net Weight: kg 15
Gross Weight: kg 22

Indicative picture for reference only

VB 10784M POWER-ASSISTED STEERING WITH ELECTRICALLY-CONTROLLED HYDRAULIC PUMP (on base) - manual

The power-assisted steering consists of an electro-hydraulic system allowing power saving because the pump is driven by an electric motor.



Approx. weight and dim.:

Cm:	42x64x40h
Net Weight:	kg 8
Gross Weight:	kg 14

VB 11205M TRAINING MODEL SHOWING THE STEERING GEOMETRY (on ground) - manual



It is a rational training model which allows an easy explanation of the difficult steering geometry. Each part can be moved or adjusted so that the teacher can clearly show the following parts:

- Wheel inclination
- Rolling radius
- Caster
- King pin inclination
- Toe-in and toe-out

Approx. weight and dim.:

Cm:	80x70x45h
Net Weight:	kg 15
Gross Weight:	kg 25

In particular the teacher can clearly show the effects of the steering trapezium.

This model can be arranged on the ground to simulate driving conditions.

It is provided with active suspensions.

The wheels can be adjusted separately to emphasize all the faults which can occur in a car having fore carriage functional defects.

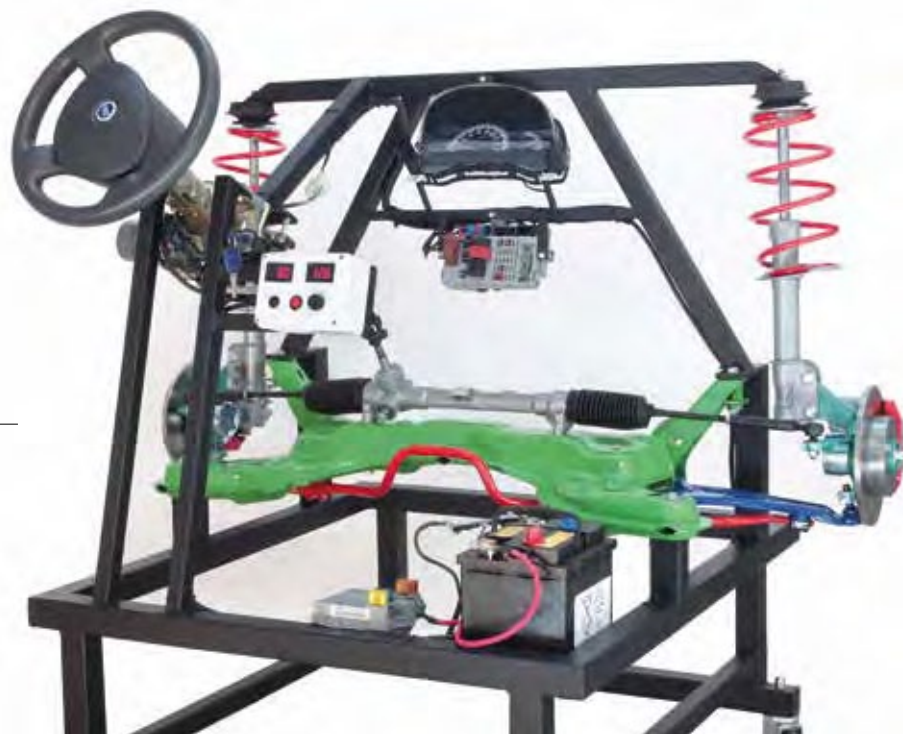
On request we can supply a handbook with practical and theoretical instructions.

VB 10778E ELECTRIC POWER ASSISTED STEERING (EPS) WITH SUSPENSIONS (on stand with wheels) - electrical

Electrical power steering (EPS) trainer in working conditions with fully operating McPherson suspension, for the study of the steering system. Any information used by the steering (car speed, alternator, city, steering effort) can be varied by the user. An instrument cluster and two displays show all information concerning the operation.

Large production and diffusion EPS complete with:

- Operating McPherson struts, rack and pinion
- Adjustment of the steering effort directly on the rack
- Vehicle speed simulation from 0 to 120 km/h
- Normal/city push-button
- Alternator simulation
- Indicator lamp and voltage/current display
- Body computer with diagnostic socket (with low speed CAN) **OBD 16 pin**



Approx. weight and dim.:

Cm: 160x130x150h
Net Weight: kg 150
Gross Weight: kg 230

VB 11201S HOMOCYNETIC JOINT (on base) - static



Approx. weight and dim.:

Cm: 55x20x15h
Net Weight: kg 4
Gross Weight: kg 6

VB 11160S PROPELLER SHAFT WITH 2 TYPES OF COUPLING - static



Approx. weight and dim.:

Cm: 15x15x60h
Net Weight: kg 4
Gross Weight: kg 6

VB 10778

VB 11201

VB 11160

Indicative picture for reference only

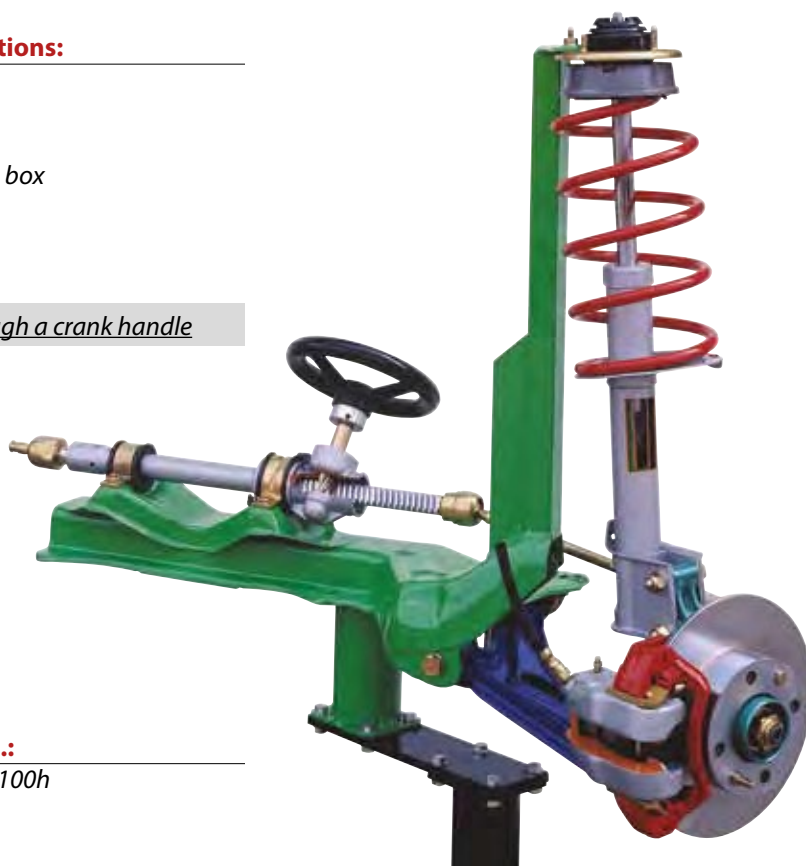
VB 11210

VB 11210M STEERING UNIT WITH McPHERSON SUSPENSIONS (on stand with wheels) - manual

Main technical specifications:

- McPherson suspension
- Shock absorber
- Spring
- Rack and pinion steering box
- Disc brake
- Steering wheel

Operated manually through a crank handle



Approx. weight and dim.:

Cm: 100x60x100h
Net Weight: kg 40
Gross Weight: kg 65

VB 11220

VB 11220M STEERING UNIT WITH McPHERSON SUSPENSIONS AND BRAKES (on stand with wheels) - manual

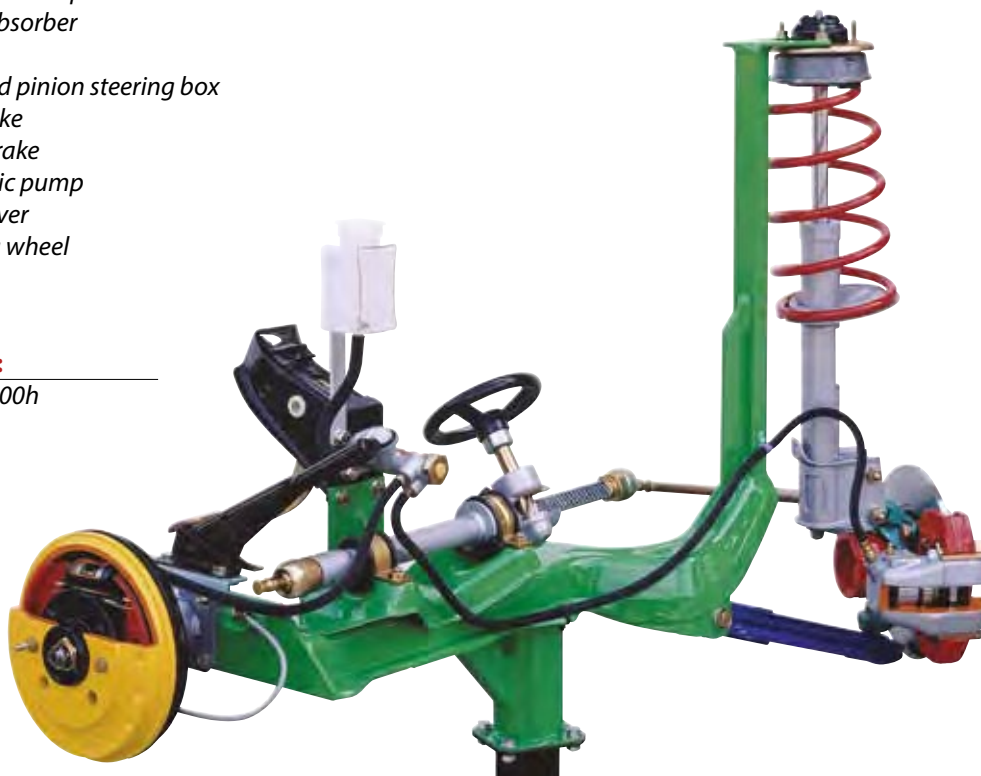
Main technical specifications:

- McPherson suspension
- Shock absorber
- Spring
- Rack and pinion steering box
- Disc brake
- Drum brake
- Hydraulic pump
- Brake lever
- Steering wheel

Operated manually through a crank handle

Approx. weight and dim.:

Cm: 120x60x100h
Net Weight: kg 50
Gross Weight: kg 75



*These cutaway models are carefully sectioned for training purposes, professionally painted with different colours to better differentiate the various parts.
Many parts have been chromium, plated and galvanized for a longer life.*

Indicative picture for reference only

VB 11202M CAR FORECARRIAGE (on stand with wheels) - manual

Standard car fore-carriage with McPherson suspension and steering box with pinion and rack. Complete with disc brakes. (This unit is not cross sectioned).

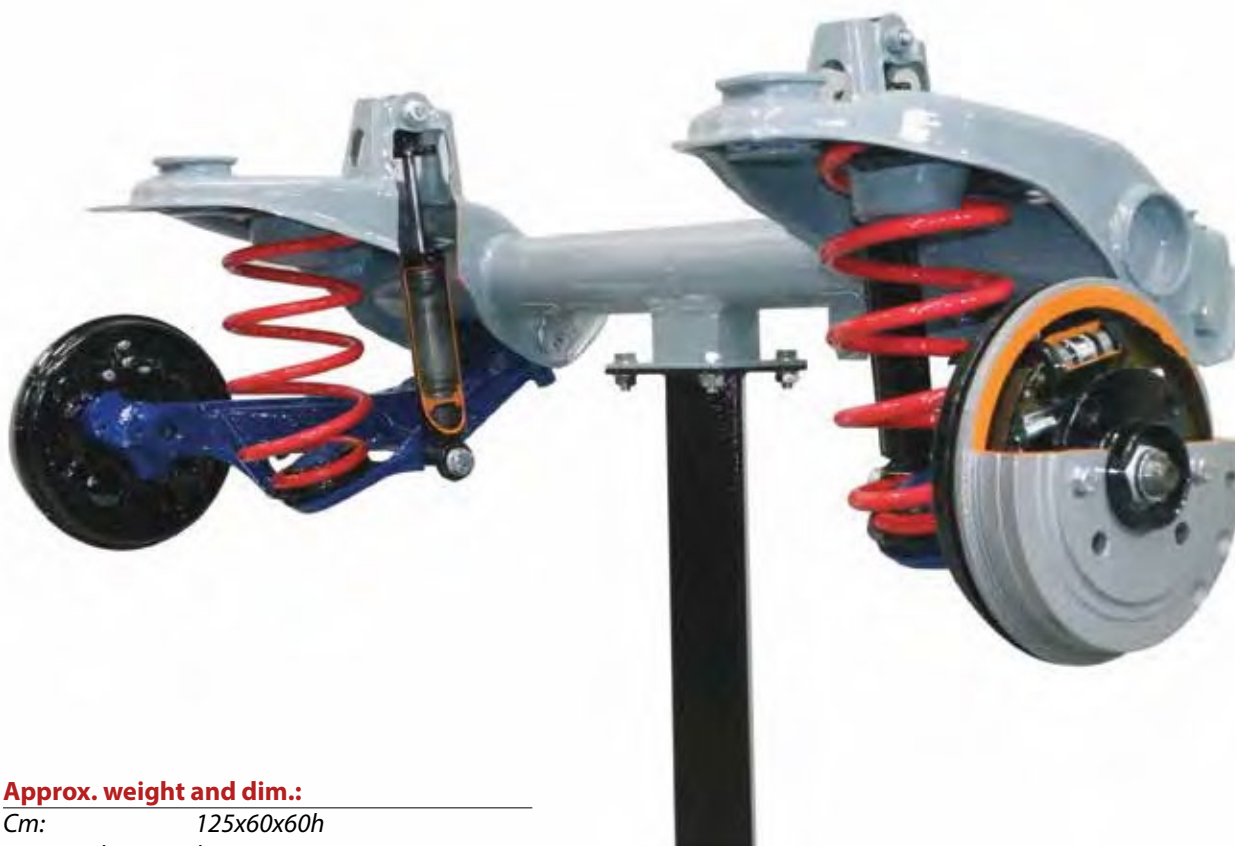


Approx. weight and dim.:

Cm: 100x155x130h
Net Weight: kg 80
Gross Weight: kg 120

VB 11202

VB 11204M REAR AXLE (on stand with wheels) - manual



Approx. weight and dim.:

Cm: 125x60x60h
Net Weight: kg 52
Gross Weight: kg 70

VB 11204

Indicative picture for reference only

VB 11206S MULTILINK SUSPENSIONS (on stand with wheels) – static

Multilink system is an independent vehicle suspension type with multiple arms (5). It is mainly used for the rear axle in order to dampen the vibrations.

Main technical specifications:

- Used on Alfa Romeo, Mercedes, etc. cars
- Spherical/ball joint for each arm

Approx. weight and dim.:

Cm: 170x75x100h
 Net Weight: kg 84
 Gross Weight: kg 150



Indicative picture for reference only

VB 10636 HYDRAULIC McPHERSON SHOCK ABSORBER**VB 10637 HYDRAULIC SHOCK ABSORBER****VB 10638 GAS SHOCK ABSORBER****VB 10636****Approx. weight and dim.:**

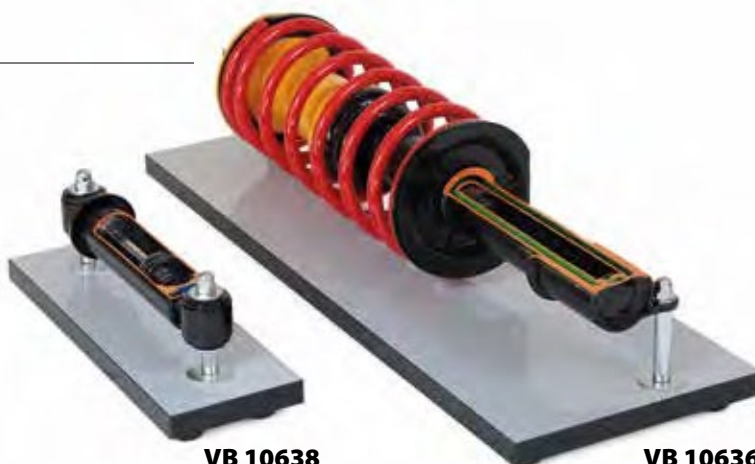
Cm: 65x25x20h
 Net Weight: kg 8
 Gross Weight: kg 10

VB 10637**Approx. weight and dim.:**

Cm: 30x10x10h
 Net Weight: kg 1,5
 Gross Weight: kg 2

VB 10638**Approx. weight and dim.:**

Cm: 30x10x10h
 Net Weight: kg 1,5
 Gross Weight: kg 2



VB 10638

VB 10636

VB 11082M HYBRID TRANSMISSION MG (MOTOR/GENERATOR) Toyota Prius (on stand with wheels) - manual

The Motor Generator 1 (MG1) operates as the control element for the power splitting planetary gear set. It recharges the HV battery and also supplies electrical power to drive Motor Generator 2 (MG2). MG1 effectively controls the continuously variable transmission function of the transaxle and operates as the engine starter.



Approx. weight and dim.:

Cm:	60x70x65h
Net Weight:	kg 100
Gross Weight:	kg 130

VB 10980M GEARBOX 5 SPEEDS + REVERSE (on panel) - manual

VB 10990M GEARBOX 5 SPEEDS + REVERSE (on stand with wheels) - manual

With possibility of selecting any speed.

Operated manually through a hand wheel.

VB 10980M

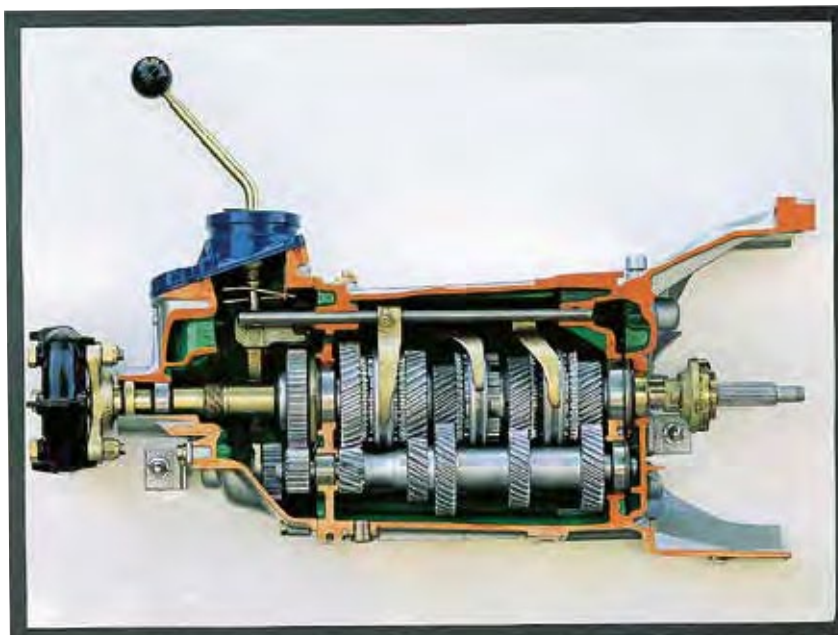
Approx. weight and dim.:

Cm:	85x65x30h
Net Weight:	kg 40
Gross Weight:	kg 60

VB 10990M

Approx. weight and dim.:

Cm:	90x65x50h
Net Weight:	kg 50
Gross Weight:	kg 75



Indicative picture for reference only

VB 11082

VB 10980 - VB 10990

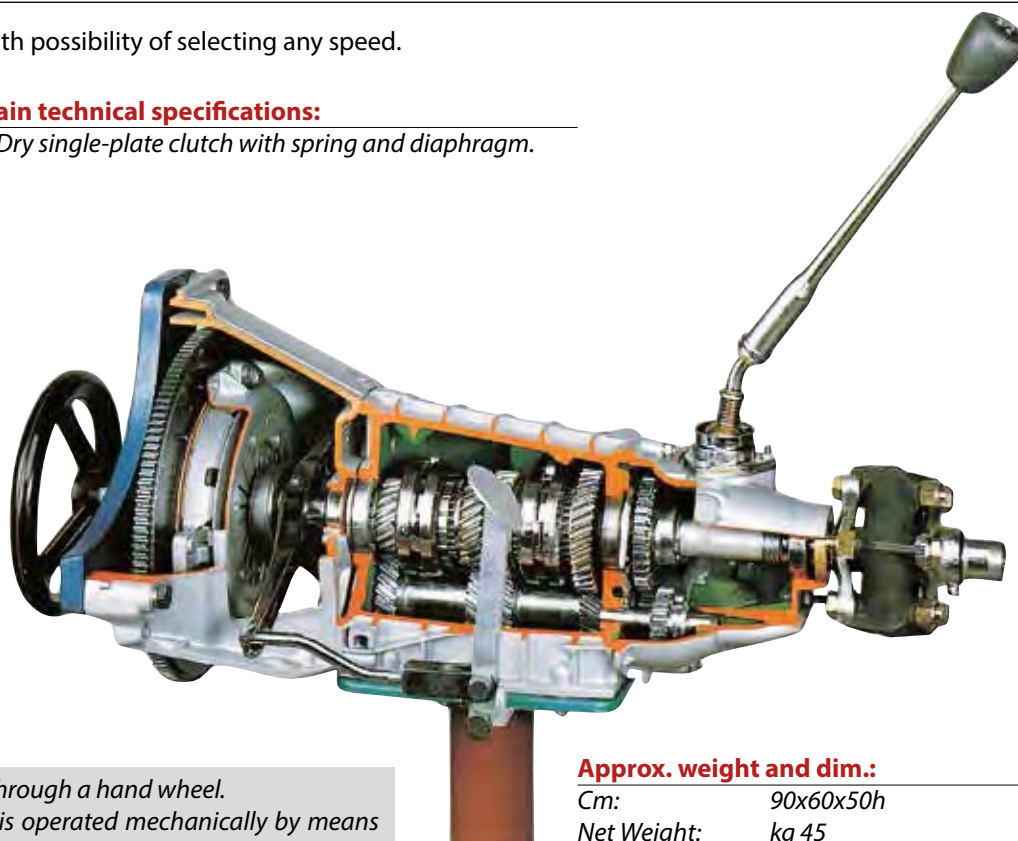
VB 11020

VB 11020M GEARBOX WITH CLUTCH 4 FORWARD SPEED + REVERSE (on stand with wheels) - manual

With possibility of selecting any speed.

Main technical specifications:

- Dry single-plate clutch with spring and diaphragm.



Operated through a hand wheel.
The clutch is operated mechanically by means
of a foot pedal for training purposes.

Approx. weight and dim.:

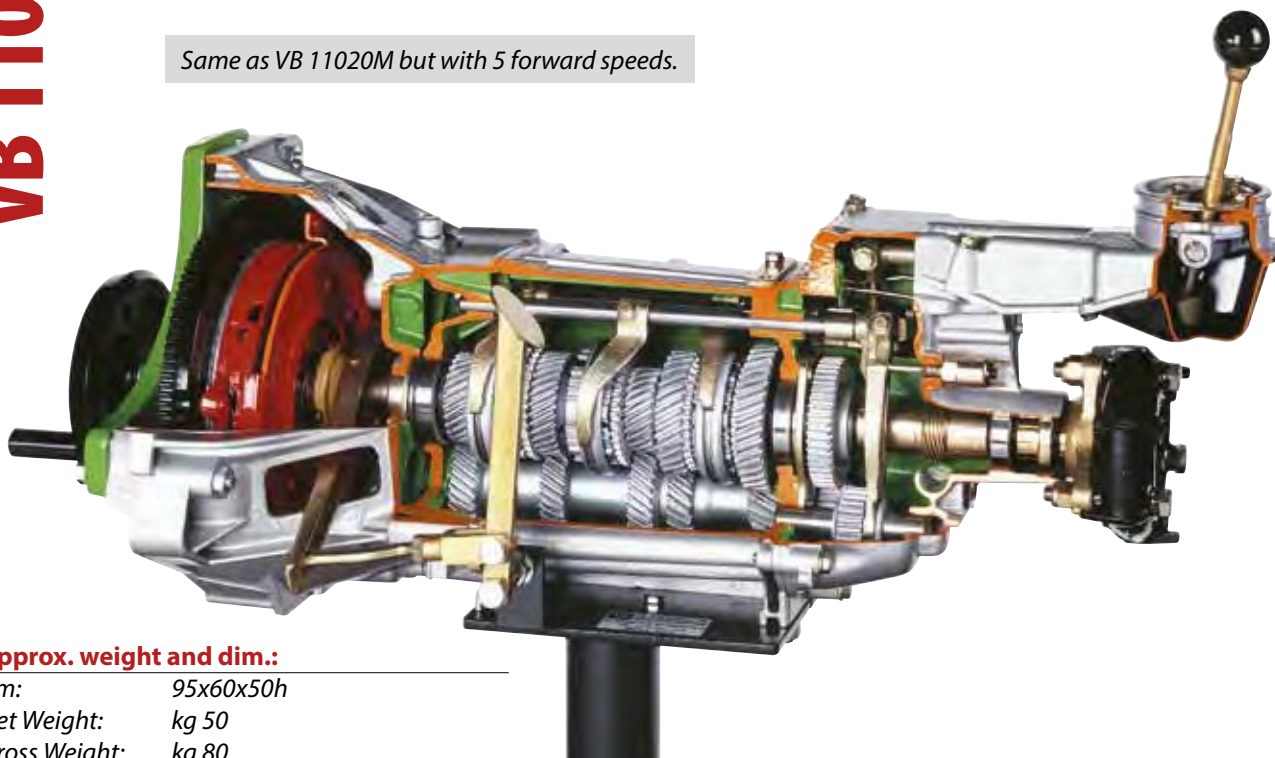
Cm:	90x60x50h
Net Weight:	kg 45
Gross Weight:	kg 65

Indicative picture for reference only

VB 11030

VB 11030M GEARBOX WITH CLUTCH 5 FORWARD SPEEDS + REVERSE (on stand with wheels) - manual

Same as VB 11020M but with 5 forward speeds.



Approx. weight and dim.:

Cm:	95x60x50h
Net Weight:	kg 50
Gross Weight:	kg 80

These cutaway models are carefully sectioned for training purposes, professionally painted with different colours to better differentiate the various parts.
Many parts have been chromium, plated and galvanized for a longer life.

VB 11005M GEARBOX WITH DIFFERENTIAL 5 FORWARD SPEED + REVERSE
(on stand with wheels) - manual

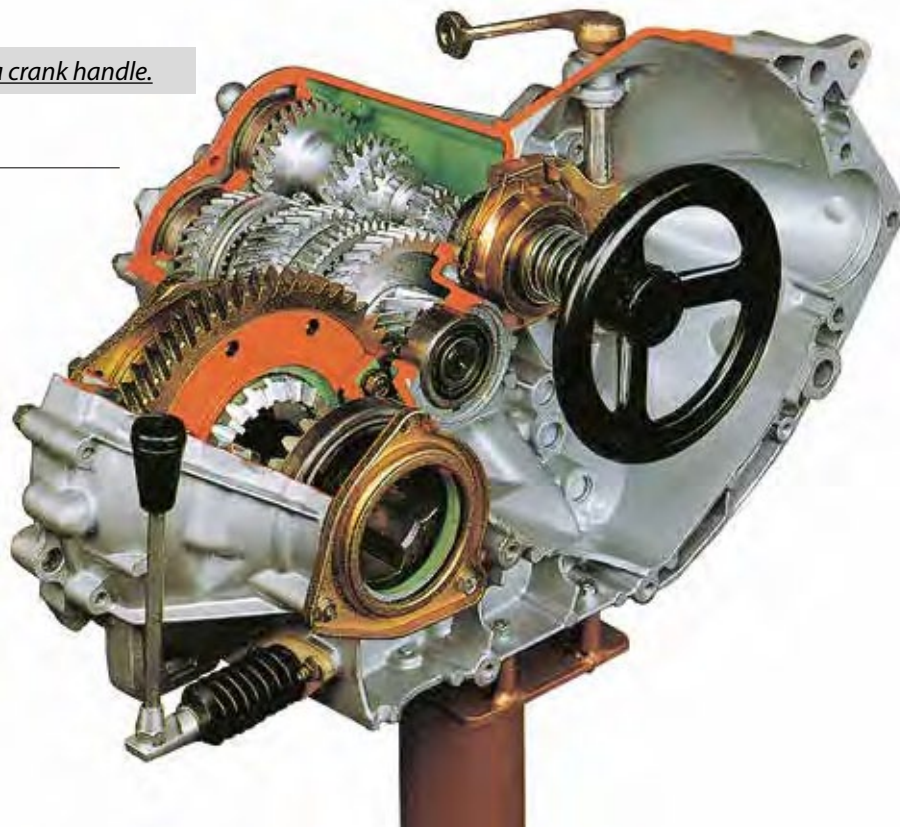
Operated manually through a crank handle.

Approx. weight and dim.:

Cm: 60x60x60h

Net Weight: kg 50

Gross Weight: kg 70

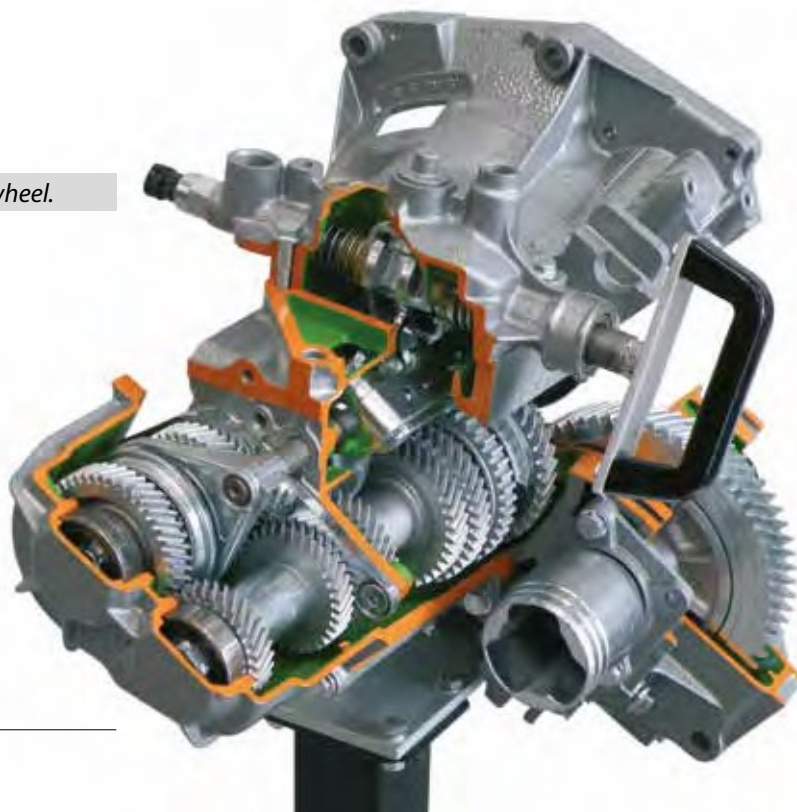


VB 11005

*These cutaways are carefully sectioned for training purposes, professionally painted with different colours to better differentiate the various parts, cross-sections.
Many parts have been chromium, plated and galvanized for a longer life.*

VB 11006M GEARBOX WITH DIFFERENTIAL 6 FORWARD SPEEDS + REVERSE
(on stand with wheels) - manual

Operated manually through a hand wheel.



VB 11006

Approx. weight and dim.:

Cm: 70x70x80h

Net Weight: kg 40

Gross Weight: kg 55

Indicative picture for reference only

VB 10788

VB 10788M GEARBOX WITH DIFFERENTIAL 5 FORWARD SPEED + REVERSE + HYDRAULIC CONTROL CLUTCH (on support) - manual



Sectioned gearbox with working non-sectioned hydraulic clutch. The movement of the clutch disc is visible when applying pressure on the pedal. Gears can be selected by means of a mechanical lever.

Approx. weight and dim.:

Cm:	60x60x60h
Net Weight:	kg 60
Gross Weight:	kg 90

Indicative picture for reference only

VB 10789

VB 10789M FRONT DRIVE GEARBOX WITH DIFFERENTIAL 5 FORWARD SPEEDS + REVERSE + MECHANICAL FUNCTIONING OF THE CLUTCH (on support) - manual



Just pushing the pedal you can observe the mechanical functioning of the clutch

Approx. weight and dim.:

Cm:	70x70x80h
Net Weight:	kg 65
Gross Weight:	kg 95

VB 11040M AUTOMATIC TRANSMISSION (on stand with wheels) - manual



Main technical specifications:

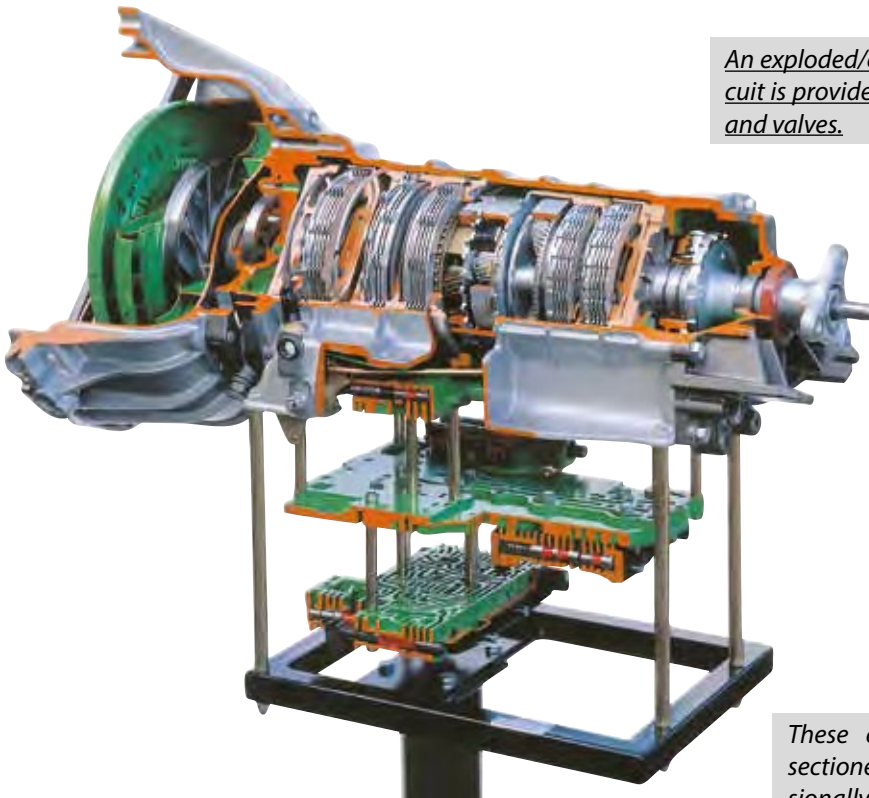
- Hydraulic converter
- Epicyclic gear with 3 forward speeds + reverse
- Multiple-plate clutches
- Control valves

Operated manually by means of a crank handle applied on the converter.

Approx. weight and dim.:

Cm: 100x65x70h
Net Weight: kg 70
Gross Weight: kg 90

VB 11060M AUTOMATIC TRANSMISSION REAR DRIVE 5 FORWARD SPEED + REVERSE WITH ELECTRONIC CONTROL (on stand with wheels) - manual



An exploded/cutaway view of the hydraulic circuit is provided to better show its various ducts and valves.

Approx. weight and dim.:

Cm: 90x60x100h
Net Weight: kg 60
Gross Weight: kg 85

These cutaway models are carefully sectioned for training purposes, professionally painted with different colours to better differentiate among the various parts. Many parts have been chromium, plated and galvanized for a longer life.

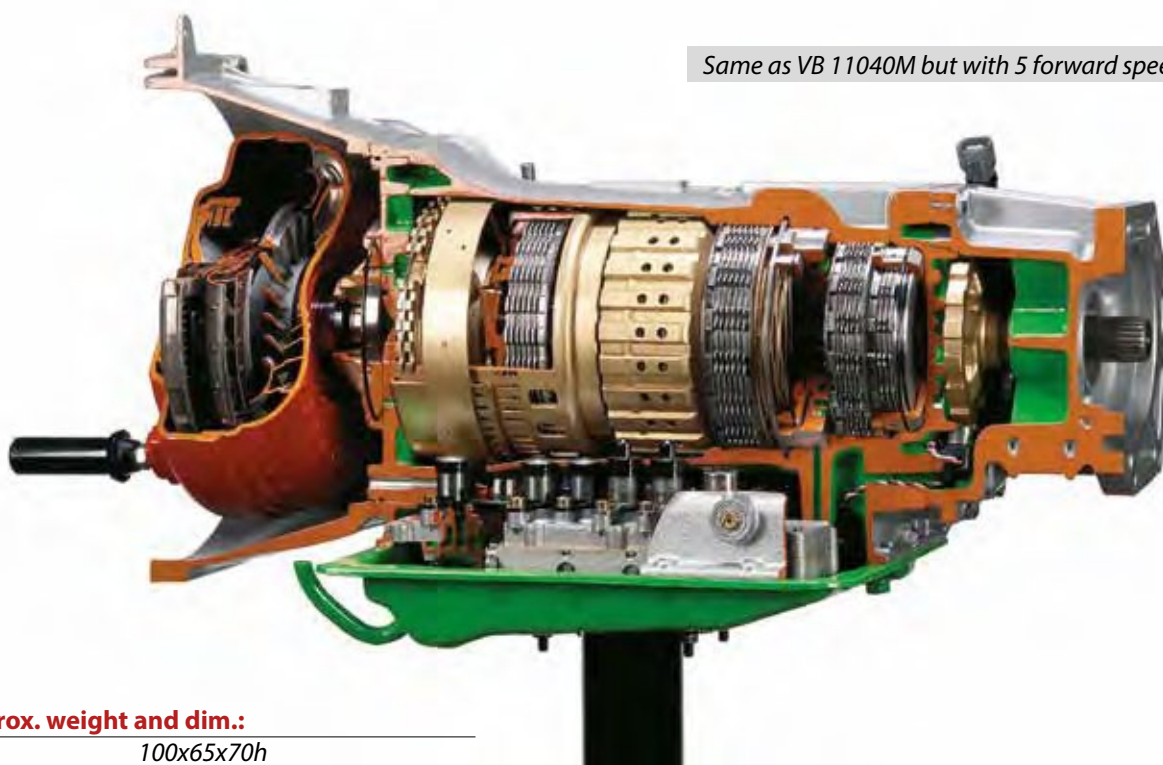
VB 11040

VB 11060

Indicative picture for reference only

VB 11042

VB 11042M AUTOMATIC TRANSMISSION 5 FORWARD SPEED + REVERSE (on stand with wheels) - manual



Same as VB 11040M but with 5 forward speeds.

Approx. weight and dim.:

Cm:	100x65x70h
Net Weight:	kg 75
Gross Weight:	kg 100

These cutaway models are carefully sectioned for training purposes, professionally painted with different colours to better differentiate the various parts.
Many parts have been chromium, plated and galvanized for a longer life.

Indicative picture for reference only

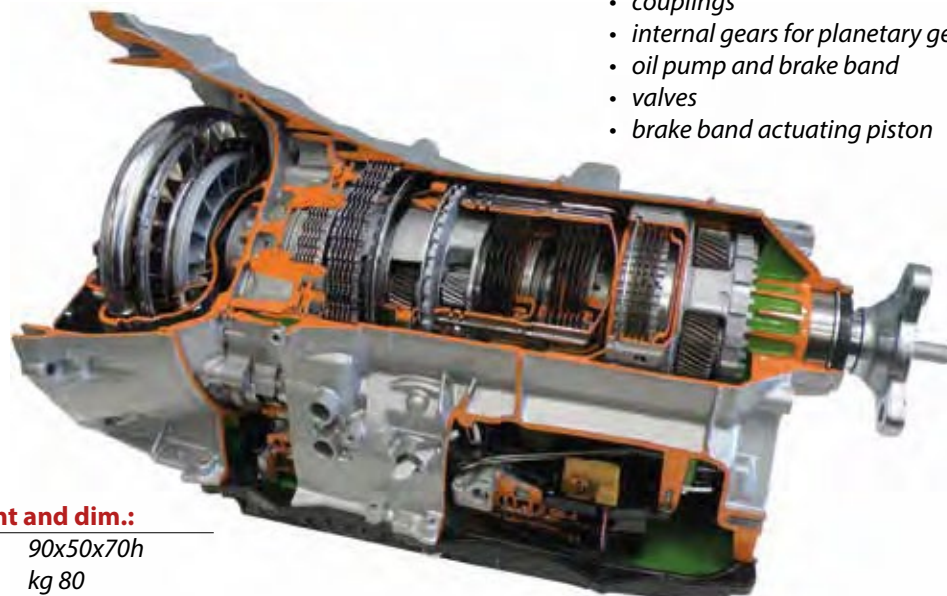
VB 11063

VB11063/6M AUTOMATIC GEARBOX 6 SPEEDS + REVERSE (on base) - manual

VB11063/7M AUTOMATIC GEARBOX 7 SPEEDS + REVERSE (on base) - manual

Main technical specifications:

- torque converter with lock-up clutch
- couplings
- internal gears for planetary gear sets
- oil pump and brake band
- valves
- brake band actuating piston



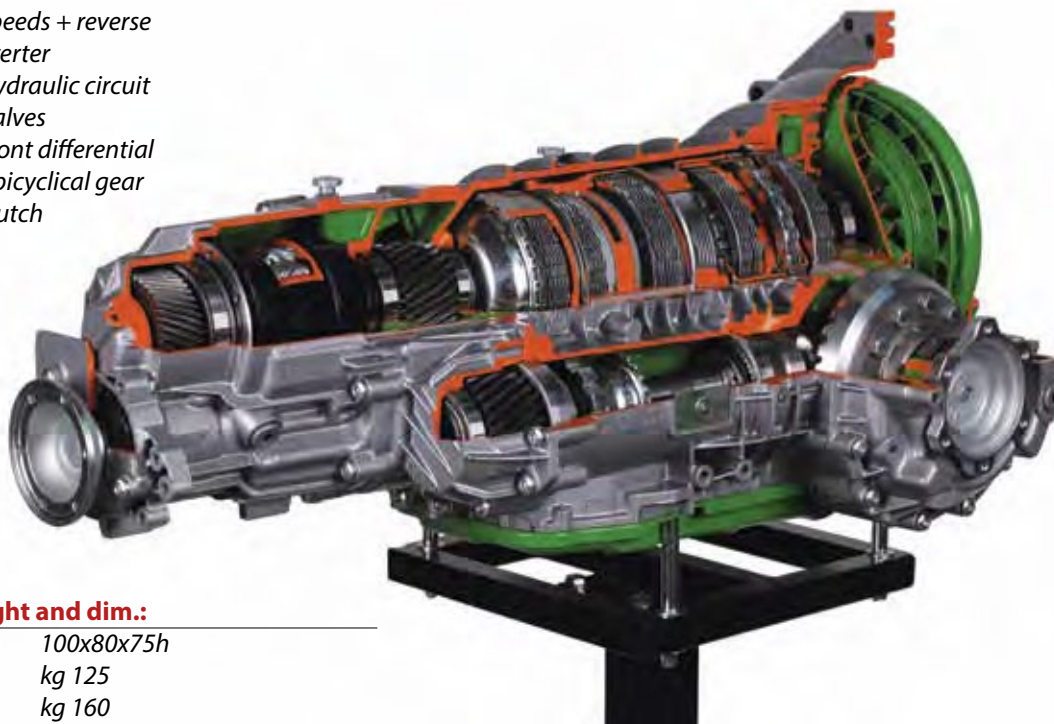
Approx. weight and dim.:

Cm:	90x50x70h
Net Weight:	kg 80
Gross Weight:	kg 110

VB 11061M AUTOMATIC ZF 5HP 4WD TRANSMISSION (on stand with wheels) – manual

Main technical specifications:

- 4 wheel drive
- 5 forward speeds + reverse
- Torque converter
- Sectioned hydraulic circuit
- Sectioned valves
- Sectioned front differential
- Sectioned epicyclical gear
- Multi disk clutch



Approx. weight and dim.:

Cm: 100x80x75h
Net weight: kg 125
Gross Weight: kg 160

VB 11062M AUTOMATIC TRANSMISSION FRONT DRIVE 4 SPEEDS + REVERSE (on stand with wheels) – manual

Main technical specifications:

- Hydraulic torque converter
- Front differential
- Epicyclical gear train
- Multi disk clutches



Approx. weight and dim.:

Cm: 50x70x70h
Net weight: kg 75
Gross Weight: kg 140

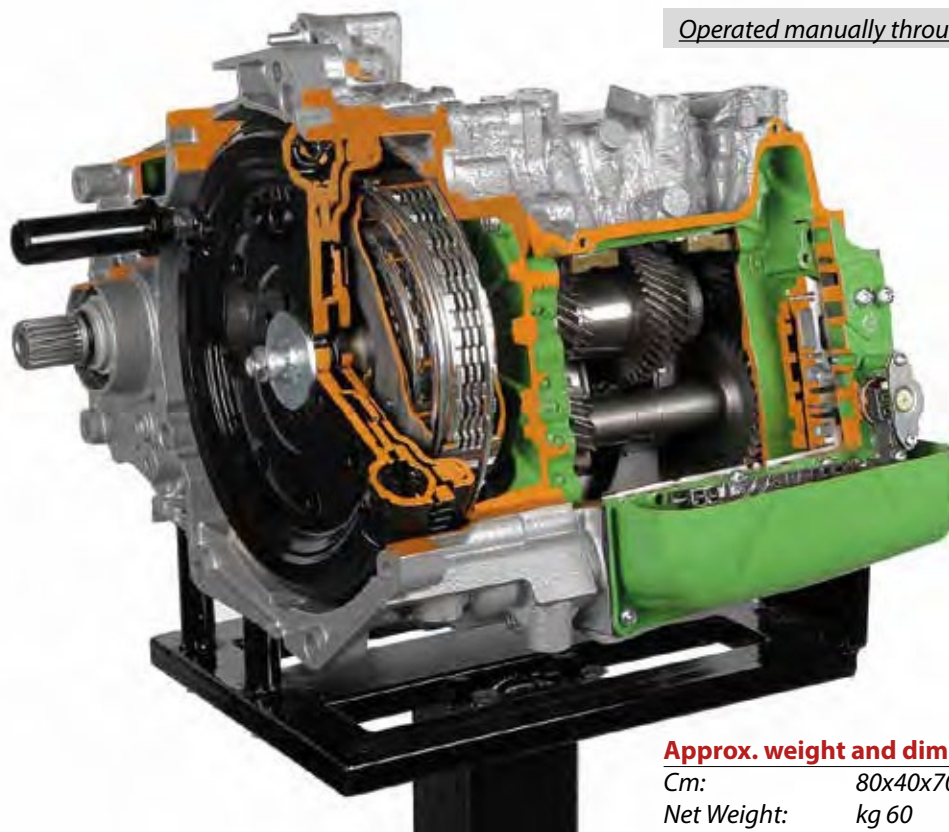
Indicative picture for reference only

VB 11061

VB 11062

VB 11064M DSG - DIRECT-SHIFT GEARBOX (on stand with wheels) - manual

Also referred to as double-clutch gearbox, it has two main shafts; one for the odd gears and the other for the even gears. Each shaft is inserted into one of the discs of the coaxial clutches. The shafts connected to the clutches can transmit motion to an auxiliary shaft having the relevant speed-gears by means of a mechanism.



Operated manually through a crank handle.

Approx. weight and dim.:

Cm:	80x40x70h
Net Weight:	kg 60
Gross Weight:	kg 85

Indicative picture for reference only

VB 11066M ROBOTISED TIP-TRONIC GEARBOX (on stand with wheels) - manual

Electronically-assisted manual gearbox in which the driver's command is translated into motion of the clutch sleeve timers by means of levers similar to those of the mechanical gearbox, operated by electro-magnetic, electro-hydraulic or electro-pneumatic actuators.



Operated manually through a crank handle.

Approx. weight and dim.:

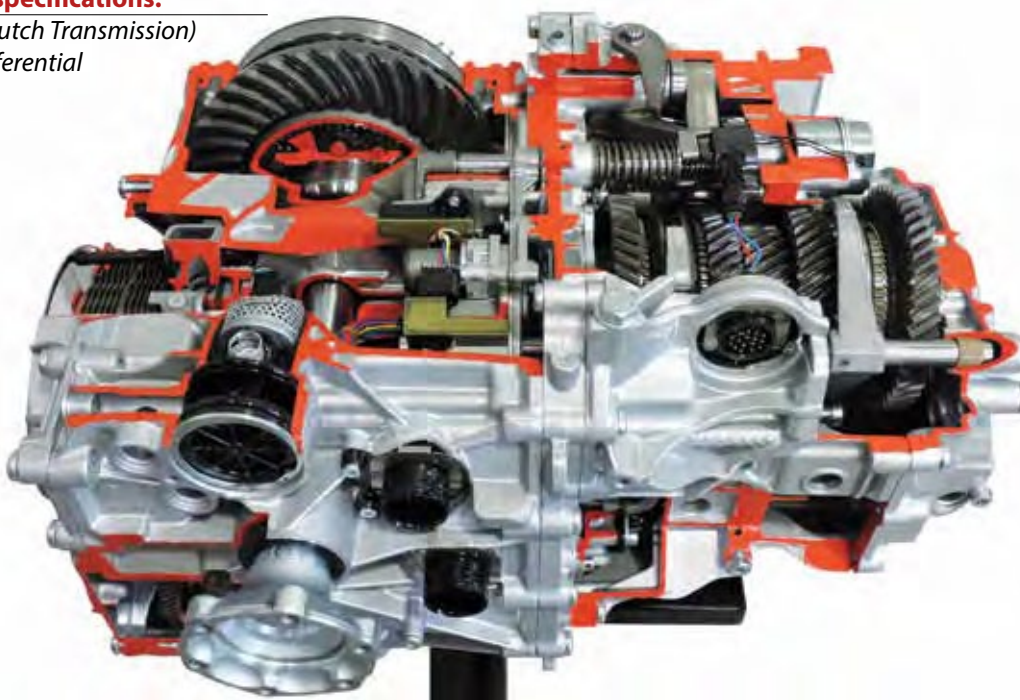
Cm:	60x50x80h
Net Weight:	kg 35
Gross Weight:	kg 55

These cutaway models are carefully sectioned for training purposes, professionally painted with different colours to better differentiate the various parts. Many parts have been chromium, plated and galvanized for a longer life.

VB 11067M GETRAG DCT 7 SPEEDS TRANSMISSION USED ON FERRARI/MERCEDES VEHICLES (on stand with wheels) – manual

Main technical specifications:

- DCT (Double Clutch Transmission)
- Self-locking differential
- Gears
- Mechatronics
- Oil filter
- Oil pump
- Shift forks



Approx. weight and dim.:

Cm:	80x80x70h
Net weight:	kg 140
Gross Weight:	kg 185

VB 11068M CONTINUOUSLY VARIABLE TRANSMISSION (CVT) GEARBOX (on stand with wheels) - manual

Special gearbox that can change continuously through an infinite number of effective gear ratios between maximum and minimum values. There are two V-belt pulleys that are split perpendicular to their axes of rotation, with a V-belt running between them.

Main technical features:

- Electro-magnetic clutch
- Forward and reverse insertion lever
- Primary pulley
- Secondary pulley
- Roller belt
- Final reduction unit
- Hydraulic command unit

Operated manually through a crank handle.



Approx. weight and dim.:

Cm:	60x50x80h
Net Weight:	kg 45
Gross Weight:	kg 75

VB 11061

VB 11068

Indicative picture for reference only

VB 11071

VB 11071M HEAVY TRUCK GEARBOX ZF 5HP (on stand with wheels) -manual



Sectioned heavy truck gearbox. Composed by:

- Torque converter with lock-up clutch
- Hydrodynamic retarder
- Rotating multi-disc clutches
- Fixed-position multi-disc brakes
- Oil cooler with oil-water exchanger
- Electro- valves

On stand with wheels – Operated manually through a crank handle.

Approx. weight and dim.:

Cm:	100x70x85h
Net Weight:	kg 295
Gross Weight:	kg 350

VB 11069

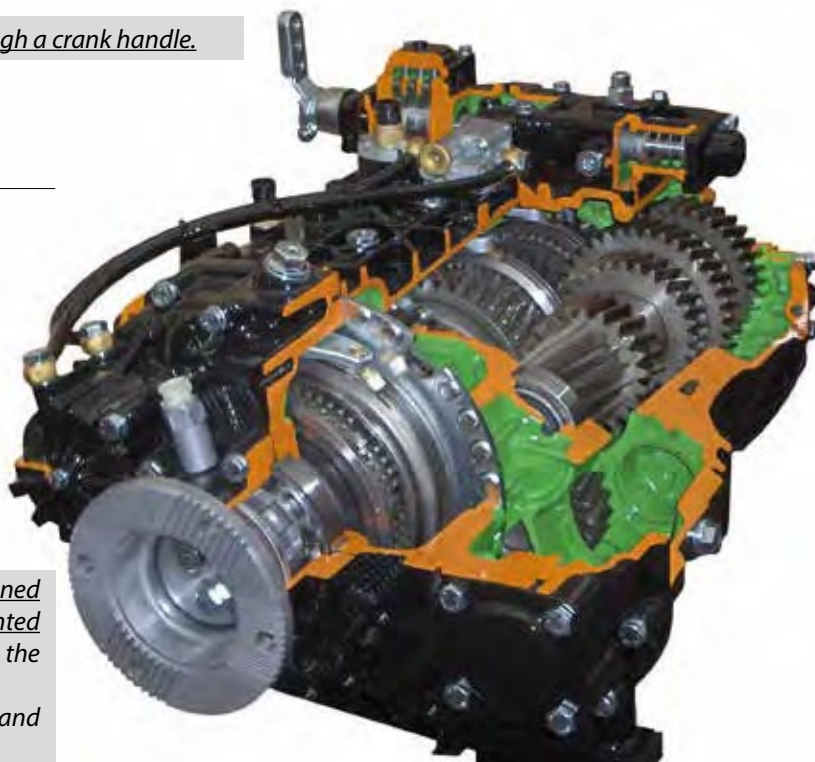
VB 11069M ZF 16S ECOSPLIT GEARBOX FOR HEAVY TRUCKS 16F + 2R (on stand with wheels) - manual

The gearbox is composed of a central box containing 4 forward speeds gearings and 2 reverse speeds gearings, epicyclic unit for selecting the speed-gears mounted on the base and over-gear on top. The over-gear allows to divide each gear into slow or fast obtaining 16 forward gears which can be inserted and geared down in sequence.

Operated manually through a crank handle.

Approx. weight and dim.:

Cm:	90x110x130h
Net Weight:	kg 280
Gross Weight:	kg 380



These cutaway models are carefully sectioned for training purposes, professionally painted with different colours to better differentiate the various parts.

Many parts have been chromium, plated and galvanized for a longer life.

Indicative picture for reference only

VB 11070M EATON FULLER 13 SPEED GEARBOX (on stand with wheels) - manual

Quick change gear box used in 300/400HP heavyweight vehicles with mechanical and pneumatic control.

It is a non-synchronized gearbox, the box is divided in 2 parts:

on the engine side are the 1st 2nd 3rd and 4th speed gears, reverse speed gears and extra low ratio pick-up speed gears.

All these gears are mechanically controlled by the change gear lever.

In the other part of the gearbox (on the output shaft side), there are the standard, low ratio and semi-low ratio speed gears, pneumatically controlled by the pre-selectors provided on the gear lever. This gearbox is made very sturdy by the presence of 2 auxiliary shafts sharing stress to an equal degree.

VB 11070



These cutaway models are carefully sectioned for training purposes, professionally painted with different colours to better differentiate the various parts. Many parts have been chromium, plated and galvanized for a longer life.

Approx. weight and dim.:

Cm:	110x100x130h
Net Weight:	kg 300
Gross Weight:	kg 400

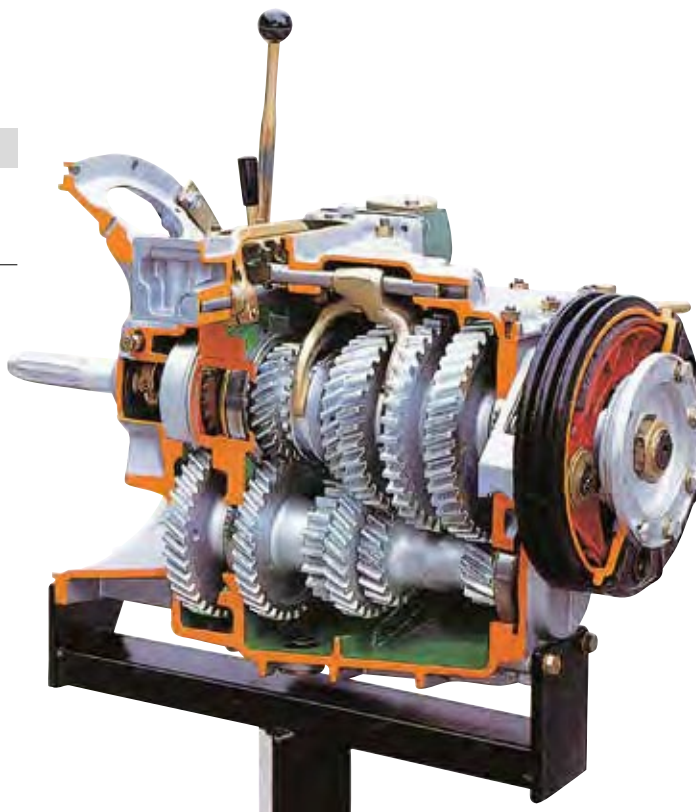
VB 11080M GEARBOX WITH REDUCTION GEAR (on stand with wheels) - manual

Gearbox for heavy vehicle.

Operated manually through a crank handle.

Approx. weight and dim.:

Cm:	80x80x140h
Net Weight:	kg 150
Gross Weight:	kg 210



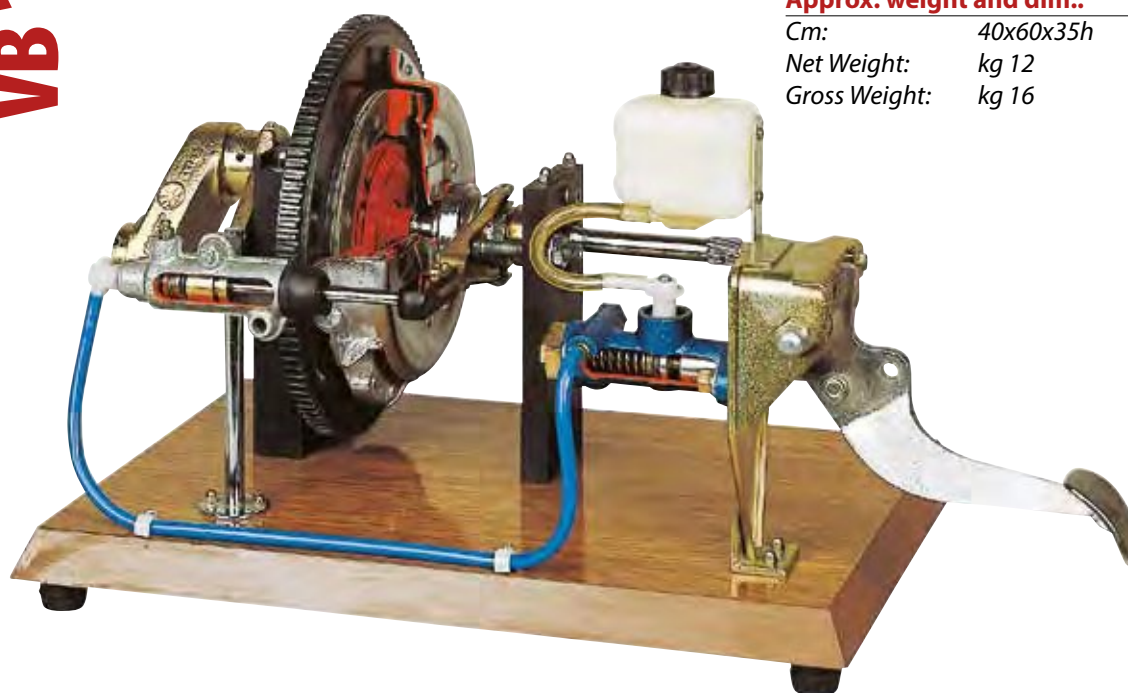
VB 11080

Indicative picture for reference only

VB 11100

VB 11100S HYDRAULIC CONTROL CLUTCH (on base) - static

This panel shows the hydraulic circuit which controls a diaphragm clutch. The pump, cylinder and clutch units are fully sectioned.



Approx. weight and dim.:

Cm: 40x60x35h

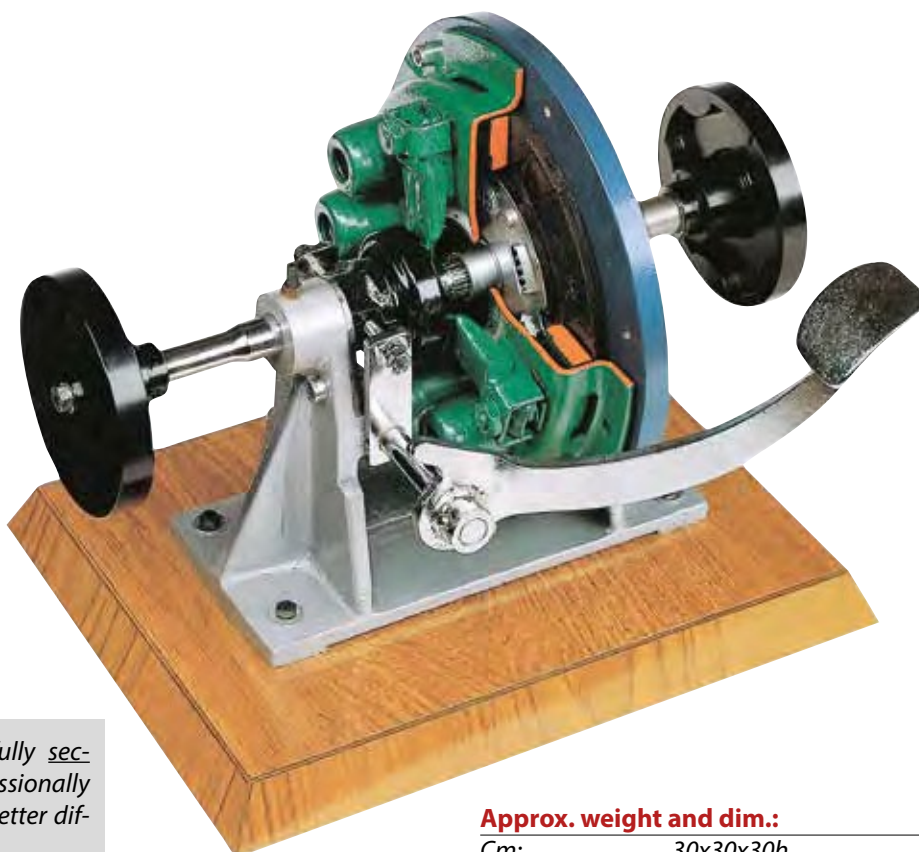
Net Weight: kg 12

Gross Weight: kg 16

VB 11110

VB 11110M SINGLE DISC CLUTCH COIL SPRING (on base) - manual

Typical example of the most common car clutch, single disc type. Its operation can be clearly observed by pressing the foot control and rotating flywheel manually by means of the dedicated hand wheel.



These cutaway models are carefully sectioned for training purposes, professionally painted with different colours to better differentiate the various parts.

Many parts have been chromium, plated and galvanized for a longer life.

Approx. weight and dim.:

Cm: 30x30x30h

Net Weight: kg 6

Gross Weight: kg 10

Indicative picture for reference only

VB 11130M MEMBRANE SPRING CLUTCH (on base) - manual

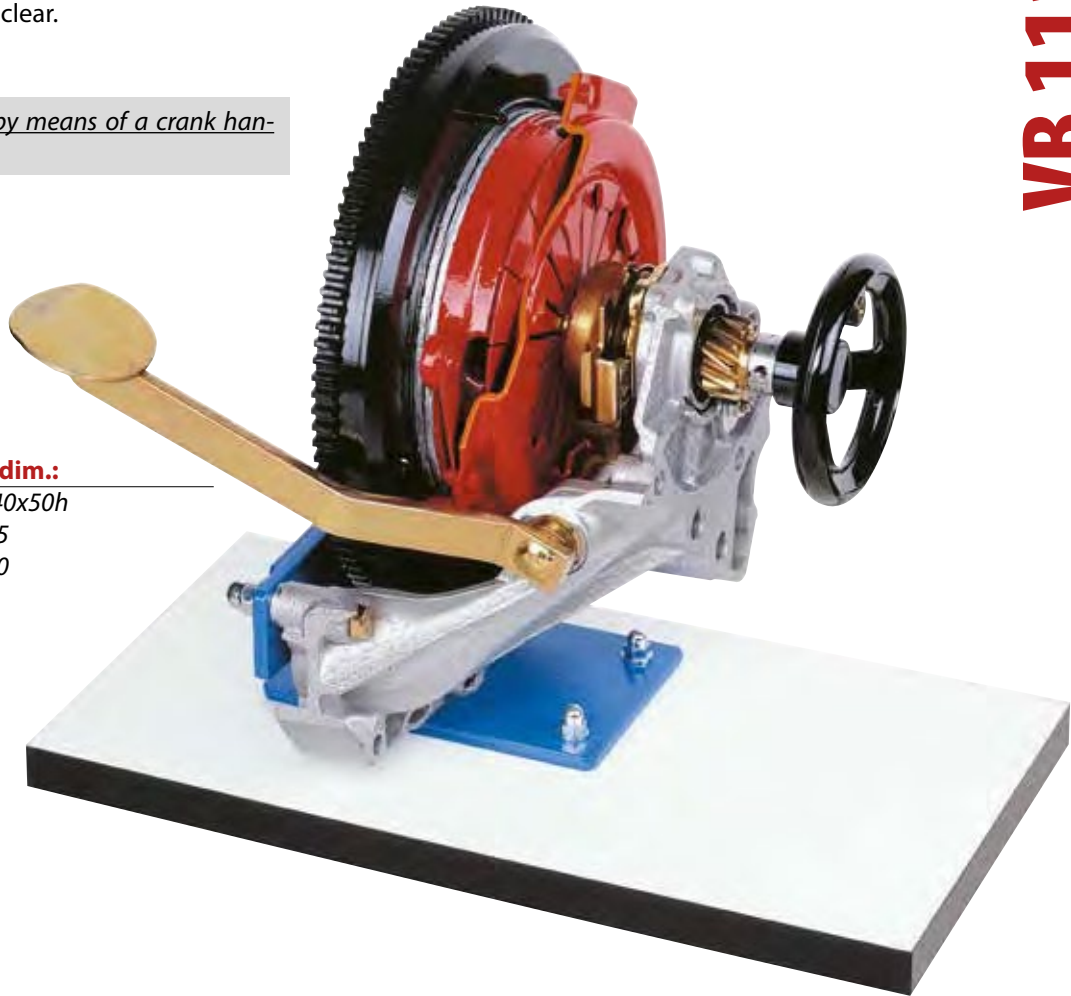
Accurate section of a car clutch assembly.

By pressing the foot control and turning the hand wheel connected to the disc the clutch operation will become immediately clear.

Operated manually by means of a crank handle.

Approx. weight and dim.:

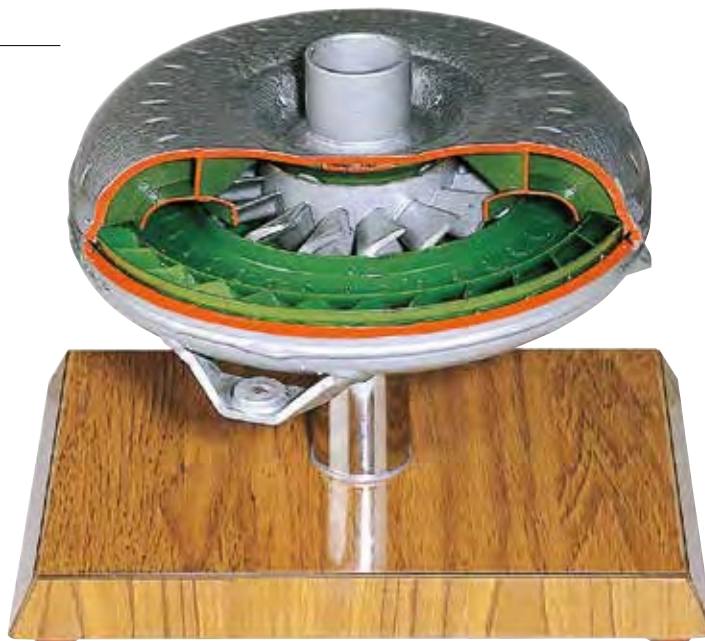
Cm: 50x40x50h
Net Weight: kg 15
Gross Weight: kg 20



VB 11140S TORQUE CONVERTER (on base) - static

Approx. weight and dim.:

Cm: 35x35x30h
Net Weight: kg 8
Gross Weight: kg 12



*These cutaway models are carefully sectioned for training purposes, professionally painted with different colours to better differentiate the various parts.
Many parts have been chromium, plated and galvanized for a longer life.*

VB 11130

VB 11140

Indicative picture for reference only

VB 11090

VB 11090S DOUBLE CLUTCH (HYDRAULIC + MECHANICAL) FOR CARS (on base) - static

Approx. weight and dim.:

Cm: 40x35x40h

Net Weight: kg 27

Gross Weight: kg 35



Indicative picture for reference only

VB 11095

VB 11095M DOUBLE CLUTCH (HYDRAULIC + MECHANICAL) FOR BUSES (on stand with wheels) - manual

Representation of a typical clutch used in buses, composed of a traditional mechanical dry clutch coupled to a hydraulic joint allowing soft starting.

Operated manually through a crank handle.

Approx. weight and dim.:

Cm: 100x100x130h

Net Weight: kg 172

Gross Weight: kg 240



These cutaway models are carefully sectioned for training purposes, professionally painted with different colours to better differentiate the various parts.

Many parts have been chromium, plated and galvanized for a longer life.

VB 11141M CENTRIFUGAL CLUTCH (on base) - manual

Accurate section of a centrifugal clutch, moving parts type used in Mopeds.

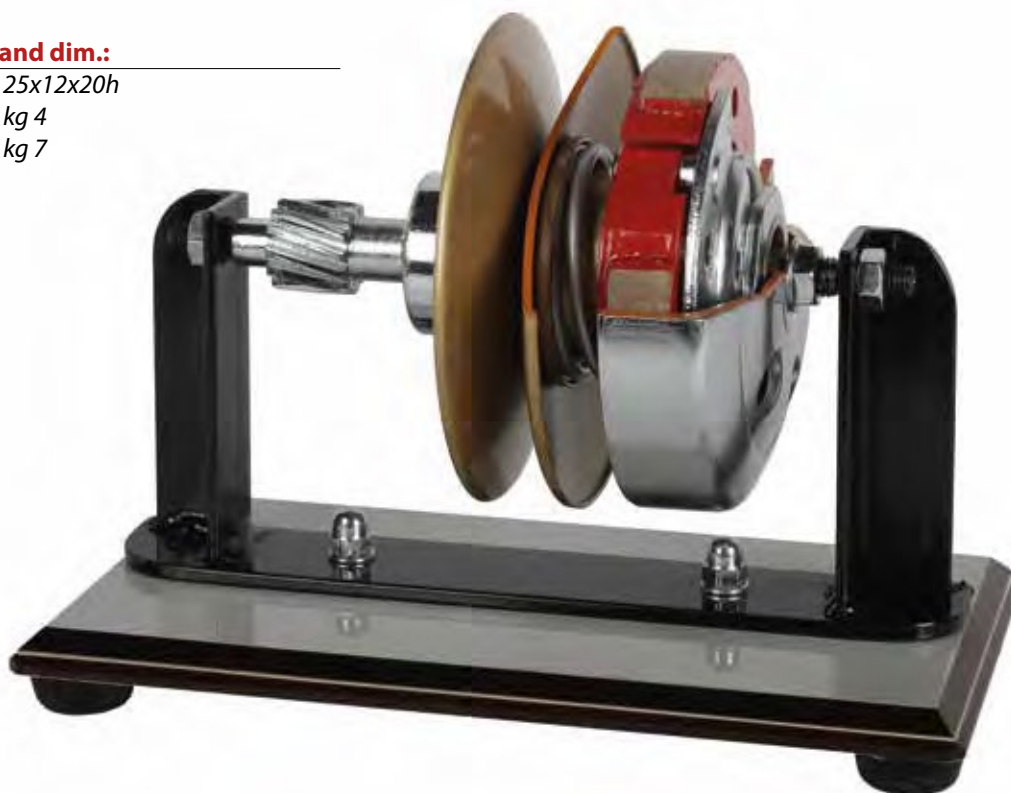
VB 11141

Approx. weight and dim.:

Cm: 25x12x20h

Net Weight: kg 4

Gross Weight: kg 7



VB 11142S MULTI DISK CLUTCH (on base) – static



Approx. weight and dim.:

Cm: 20x20x25h

Net Weight: kg 4

Gross Weight: kg 6

VB 11141

VB 11142

Indicative picture for reference only

VB 11200

VB 11200M REAR AXLE WITH DIFFERENTIAL (on stand with wheels) - manual

Rigid rear axle complete with differential unit, axle shafts and rear drum brakes, carefully sectioned to show the operation of the differential unit where planetary gears, the ring gear and the pinion are clearly displayed. A brake drum and a cylinder are sectioned too.

Operated manually through a crank handle.



Approx. weight and dim.:

Cm:	120x70x65h
Net Weight:	kg 40
Gross Weight:	kg 55

Indicative picture for reference only

VB 11295

VB 11295M - TRUCK DIFFERENTIAL WITH DOUBLE REDUCER UNIT (on stand with wheels) -manual

Reducer/differential for heavy trucks. Composed by:

- I Gear reducer with bevel gear
- II Differential reducer with cylindrical gear

On stand with wheels – Operated manually through a crank handle.



Approx. weight and dim.:

Cm:	90x70x70h
Net Weight:	kg 185
Gross Weight:	kg 230

VB 11198M - REAR AXLE HEAVY TRUCK WITH LOCKING DIFFERENTIAL (on stand with wheels) –manual

VB 11199M REAR AXLE HEAVY TRUCK WITHOUT LOCKING DIFFERENTIAL (on stand with wheels) –manual

Rear axle for heavy truck with locking differential.

Complete section of the rear axle. The main components are:

- Bevel gear (pinion – crown)
- Differential (satellite and planetary) with locking differential
- Axle shafts
- Reducer and planetary on the hub
- Brakes with jaws/drum
- Double air brake element

Indicative picture for reference only



On stand with wheels – Operated manually through a crank handle.



Approx. weight and dim.:

Cm:	235x95x1050h
Net Weight:	kg 590
Gross Weight:	kg 700

VB 11198 - VB 11199

VB 11290M LOCKING DIFFERENTIAL 100% (on base) - manual

Full locking differential usually mounted on off-road vehicles.



Approx. weight and dim.:

Cm:	50x35x35h
Net Weight:	kg 24
Gross Weight:	kg 32

Indicative picture for reference only

VB 11291M DIFFERENTIAL WITH ELECTRONIC CONTROL WITH ELECTRO HYDRAULIC JOINTS(HALDEX Type) (on table support) – manual

Main technical specifications:

- Pinion-crown group
- Differential group
- Multi disk clutch
- Control valve
- Hydraulic piston
- Outlet shafts



Approx. weight and dim.:

Cm:	40x60x40h
Net Weight:	kg 20
Gross Weight:	kg 30

VB 11250M VISCOUS COUPLING DIFFERENTIAL (on table stand) - manual

Accurate section of an assembly including a Ferguson type viscous coupling differential for four-wheel drive (4x4) motorcars.

Approx. weight and dim.:

Cm: 30x40x30h
Net Weight: kg 20
Gross Weight: kg 25



VB 11250

VB 11260M SELF-LOCKING HYPOID DIFFERENTIAL (on table stand) - manual

Accurate section of an assembly including hypoid bevel gear pair with self-locking differential.

Approx. weight and dim.:

Cm: 40x30x40h
Net Weight: kg 25
Gross Weight: kg 30



VB 11260

VB 11270M TORSEN DIFFERENTIAL (on table stand) - manual

Accurate section of Torsen bevel gear pair differential assembly, to show the complex operation system which works according to the worm screw principle. Fitted to top-of-the-range four-wheel drive (4x4) motorcars.

Approx. weight and dim.:

Cm: 40x40x40h
Net Weight: kg 20
Gross Weight: kg 25



VB 11270

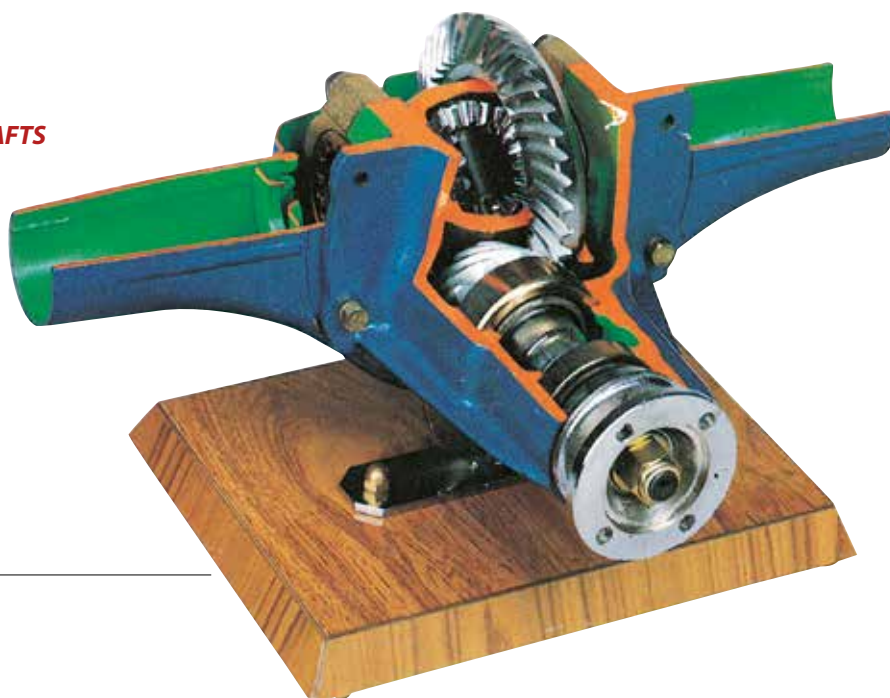
These cutaway items are carefully sectioned for training purposes, professionally painted with different colours to better differentiate the various parts. Many parts have been chromium, plated and galvanized for a longer life.

Indicative picture for reference only

VB 11280

VB 11280M HYPOID DIFFERENTIAL (on base) - manual

COMPLETE WITH SHAFTS



Approx. weight and dim.:

Cm: 50x40x30h
Net Weight: kg 30
Gross Weight: kg 40

VB 11281

VB 11281S CROWN AND PINION DIFFERENTIAL GROUP (on base) - static



Approx. weight and dim.:

Cm: 30x40x26h
Net Weight: kg 8
Gross Weight: kg 10

Indicative picture for reference only

VB 11300M 4X4 VEHICLE TRANSMISSION ASSEMBLY WITH 5 SPEED MECHANICAL GEARBOX (on stand with wheels) - manual

VB 11301M 4X4 VEHICLE TRANSMISSION ASSEMBLY WITH 3 SPEED AUTOMATIC GEARBOX (on stand with wheels) - manual

Transmission assembly fitted to most 4x4 cross-country vehicles.

The various parts are supplied as accurate real cutaway, connected together to show their operation in an easy and immediately understandable manner.

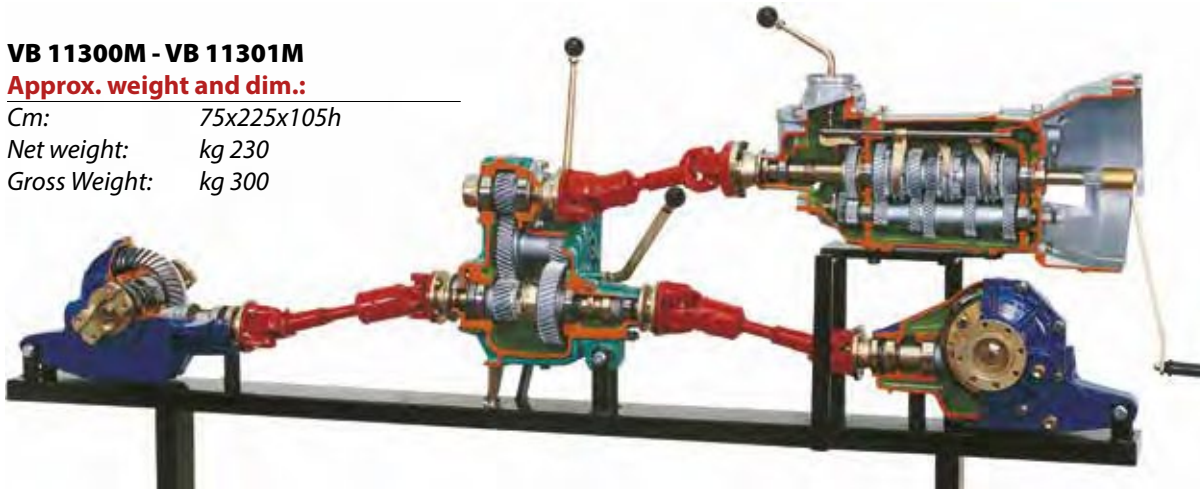
VB 11300M - VB 11301M

Approx. weight and dim.:

Cm: 75x225x105h

Net weight: kg 230

Gross Weight: kg 300



VB 11300M

Main technical specifications:

- Gearbox: 5 forward speeds+ reverse
- 2-Speeds reduction gear
- Movement restorer with front wheel drive manual control
- Drive shafts with universal joints
- **Self-locking hypoid differentials**
- Manual operation

VB 11301M

Main technical specifications:

- Gearbox: automatic transmission 3 speeds+ reverse
- 2-Speeds reduction gear
- Movement restorer with front wheel drive manual control
- Drive shafts with universal joints
- **Self-locking hypoid differentials**
- Manual operation

VB 11084M - 4WD TRANSFER CASE WITH LOCKING DIFFERENTIAL (on base) – manual

Speed reducer transfer case for 4WD cars. It is permanent with possibility of differential locking in order to make the front axle independent from the rear one.

On base – Operated manually through a crank handle.



Approx. weight and dim.:

Cm: 40x40x60h

Net Weight: kg 25

Gross Weight: kg 40

Indicative picture for reference only

VB 11300 - VB 11301

VB 11084

VB 10790

VB 10790M EDUCATIONAL MODEL OF PLANETARY-GEAR (on base) - manual

This model shows very clearly and instructively the operating system of a planetary gear and the available gearshift possibilities.
Topical as in every automatic motorcar transmission there is a planetary gear.

Approx. weight and dim.:

Cm:	25x25x30h
Net Weight:	kg 5
Gross Weight:	kg 8



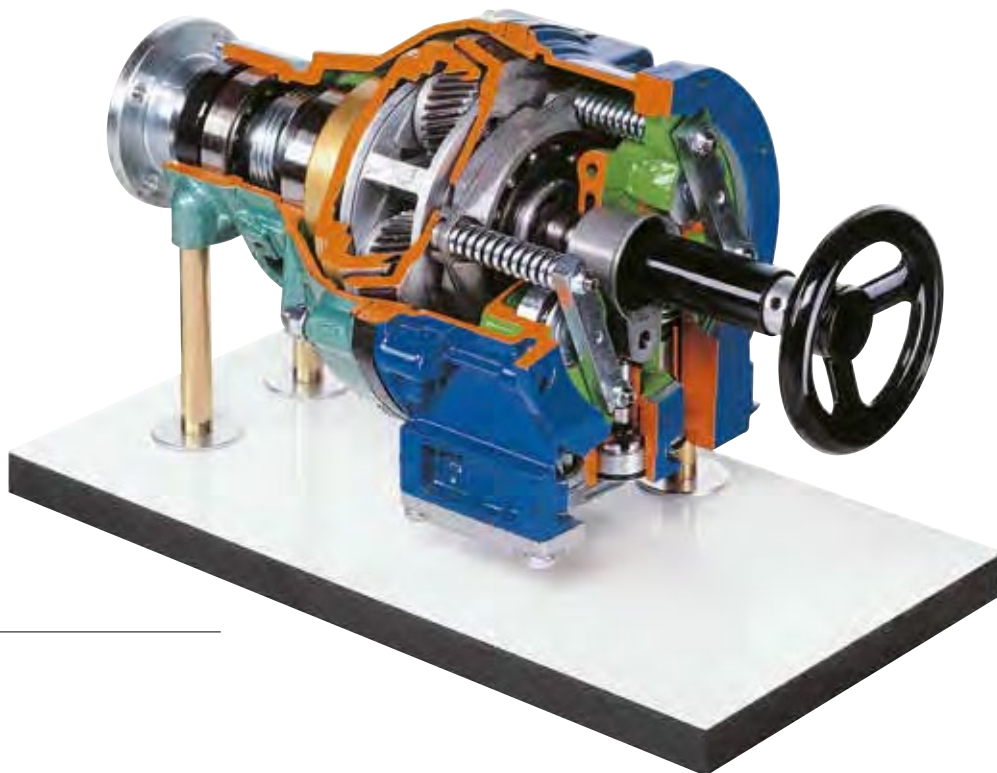
Indicative picture for reference only

VB 11150

VB 11150M OVERDRIVE (on base) - manual

Epicyclic overdrive cutaway model, with electromagnetic actuator, of the type fitted to Volvo motorcars.

Operated manually through a crank handle.



Approx. weight and dim.:

Cm:	50x30x40h
Net Weight:	kg 15
Gross Weight:	kg 20

*These cutaway models are carefully sectioned for training purposes, professionally painted with different colours to better differentiate the various parts and cross-sections.
Many parts have been chromium, plated and galvanized for a longer life.*

VB 12275E HYDRAULIC DOUBLE CIRCUIT BRAKE SYSTEM SIMULATOR - electrical

VB 12275

The simulator is composed by authentic elements from the braking system of a medium powered vehicle.

The functioning is guaranteed by means of a three-phase electric motor 380V, which transmits the motion to the front and to the rear wheels in the two directions by means of an hydraulic engine.

The servo brake is connected to a vacuum pump in order to simulate its motion. A range of manometers and taps allow to measure and to change the pressure in the two systems (front and rear).

The brake pedal is connected to a lever in order to measure the foot effort during the braking phase.

Indicative picture for reference only



Main technical specifications:

- 2 Disc brakes connected to a constant-speed joint
- 2 Drum brakes connected to axle shafts
- Double circuit hydraulic brake pump with tank
- Depression servo brake with pedal
- Hand brake lever connected to rear drums
- Hydraulic diverter to reverse the spin direction
- Hydraulic ECU connected to an hydraulic engine in order to transmit the motion to the wheels
- A range of manometers to measure the pressures
- A range of taps to simulate circuit interruptions
- Vacuum pump for servo brake

Approx. weight and dim.:

Cm: 120x160x154h
Net Weight: kg 270
Gross Weight: kg 400

Purposes:

This item has been created in order to make the students:

- practice the maintenance of the braking system
- test the efficiency of the braking system
- simulate the front and rear circuit failures
- simulate the presence of water in the braking system
- recognize whether there is the servo brake or not
- observe the functioning of the service brake
- test the efficiency of the braking system when the brake temperature changes

VB 12040

VB 12040S SELF-VENTILATING BRAKE APPARATUS WITH 4 SMALL PISTONS (on base) – static

Brake apparatus which can be installed either on front or rear wheels on high performances vehicles.

The section highlights:

- self-ventilating brake disk
- 4 pistons brake caliper with oil duct
- brake pads



Approx. weight and dim.:

Cm: 50x50x50h

Net Weight: kg 18

Gross Weight: kg 25

VB 12041

VB 12041S SELF-VENTILATING BRAKE APPARATUS WITH 6 SMALL PISTONS (on base) – static

Brake apparatus which can be installed on high performances vehicles such as Ferrari, Lamborghini, Porsche, etc.

The section highlights:

- self-ventilating brake disk
- 6 pistons brake caliper with hydraulic connection
- brake pads



Approx. weight and dim.:

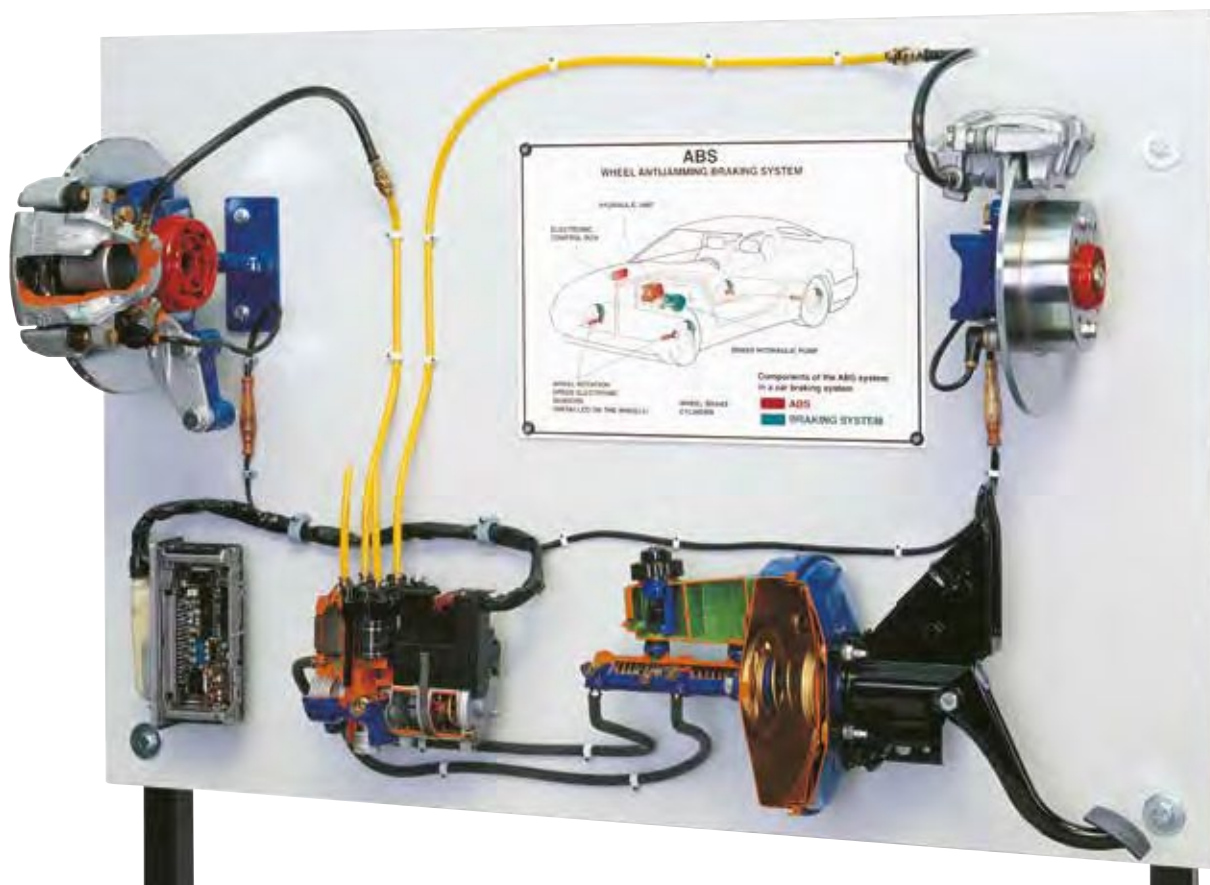
Cm: 50x50x50h

Net Weight: kg 22

Gross Weight: kg 30

Indicative picture for reference only

VB 12230 ABS BRAKE BOARD (on stand with wheels) - static



Educational model of a modern ABS braking system for motorcars. All the brake parts are provided as detailed cutaway models, connected together to enable easy understanding of the brake assembly operation.

The assembly consist of:

- Self-ventilating disc brake with phonic wheel and sensor
- Rear disc brake with phonic wheel and sensor
- Servo brake with foot control panel and brake pump
- Electronic control unit
- Oil tank

Approx. weight and dim.:

Cm:	140x50x90h
Net Weight:	kg 60
Gross Weight:	kg 120

VB 12251S ABS PUMP (on base) – static

VB 12252S ESP PUMP (on base) – static



VB 12251S

Approx. weight and dim.:

Cm:	40x35x40h
Net Weight:	kg 8
Gross Weight:	kg 15



VB 12252S

Approx. weight and dim.:

Cm:	35x30x30h
Net Weight:	kg 6
Gross Weight:	kg 10

VB 12230

VB 12251 - VB 12252

VB 12000

VB 12000M DISC BRAKE (on base) - manual

Section of a disc brake, floating type. The small piston and the brake strips are clearly shown.

Approx. weight and dim.:

Cm:	35x40x40h
Net Weight:	kg 11
Gross Weight:	kg 15



VB 12010

VB 12010M DRUM BRAKE (on base) - manual

Section of a drum brake. The cylinder and shoes are clearly shown.

Operated manually through the parking brake lever.

Approx. weight and dim.:

Cm:	35x35x35h
Net Weight:	kg 8
Gross Weight:	kg 12



Indicative picture for reference only

VB 12030

VB 12030M DISC + DRUM BRAKE (on base) - manual

Particular brake for luxury cars composed of brake pump, oil tank and brake lever and disc brake in which there is a drum brake.

Operated manually through the parking brake lever.

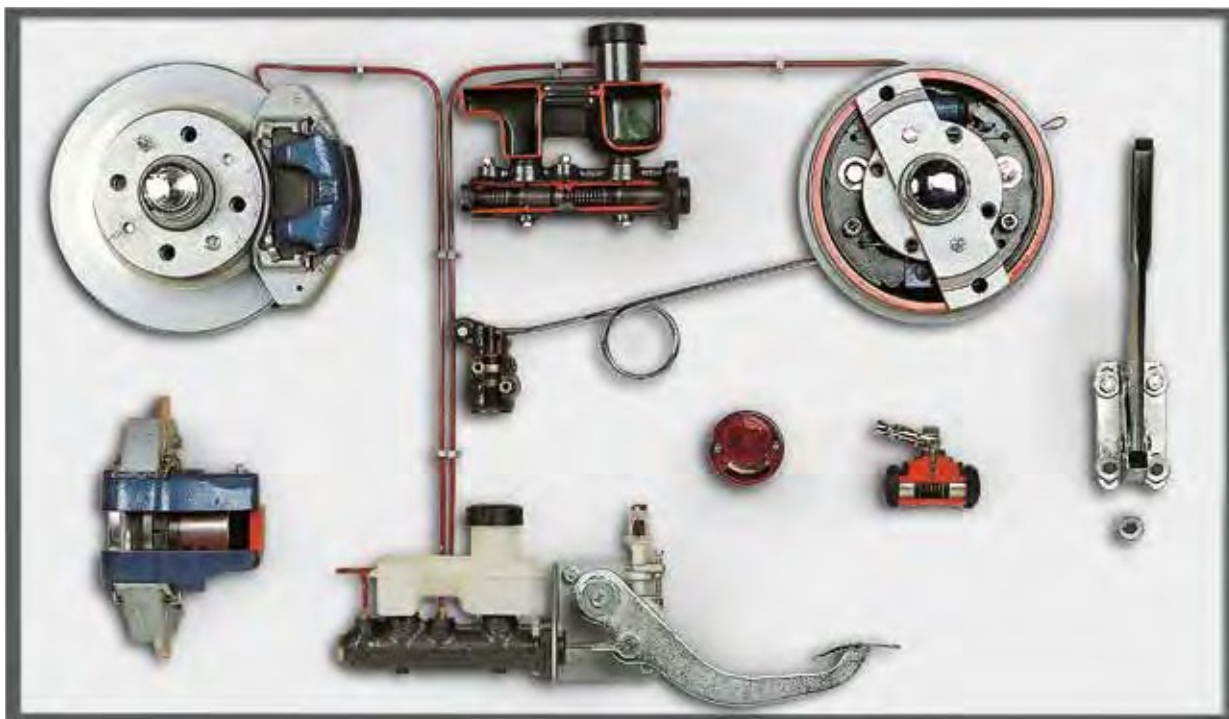
Approx. weight and dim.:

Cm:	40x35x40h
Net Weight:	kg 20
Gross Weight:	kg 26

These cutaway models are carefully sectioned for training purposes, professionally painted with different colours to better differentiate among the various parts. Many parts have been chromium, plated and galvanized for a longer life.



VB 12050M DOUBLE CIRCUIT BRAKES (on panel) - manual



VB 12050

Indicative picture for reference only

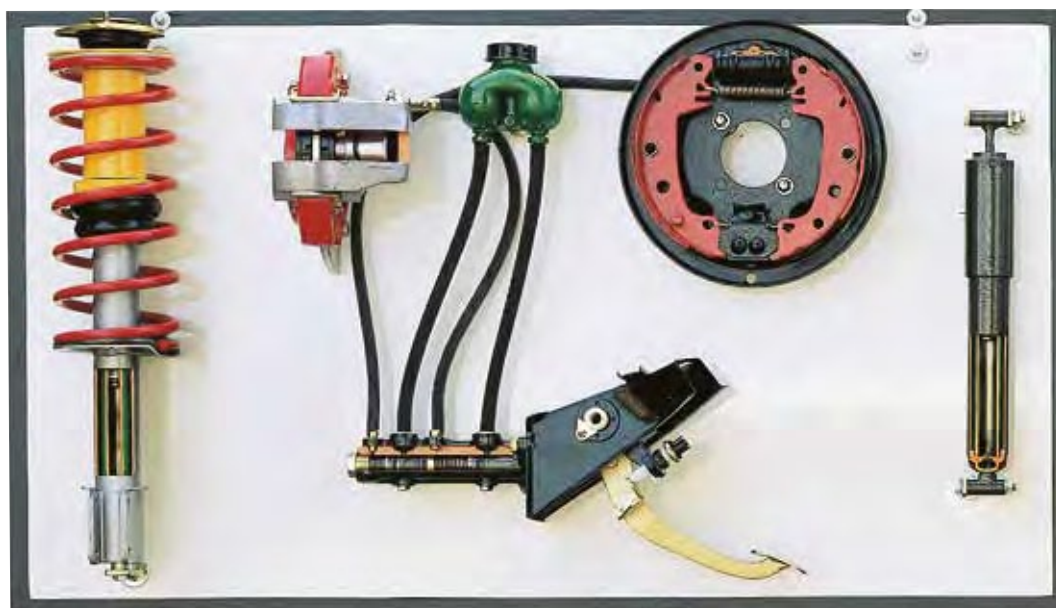
Wall panel representing a double circuit braking system. As in real conditions, it is operated by a hydraulic pump connected to the disc brake and a drum brake. A braking adjuster is placed between the pump and the (rear) drum brake in the circuit in order to avoid the rear wheels locking during the braking phase.

The same devices used in the circuit have been sectioned and added in the panel to clearly show their operation.

Approx. weight and dim.:

Cm:	110x30x85h
Net Weight:	kg 35
Gross Weight:	kg 65

VB 12060S BRAKE + SUSPENSION (on panel) - static



VB 12060

This wall panel consists of:

- Disc brake
- Drum brake
- Double brake pump
- Rear damper
- McPherson damper

Approx. weight and dim.:

Cm:	110x65x30h
Net Weight:	kg 30
Gross Weight:	kg 45

VB 12300

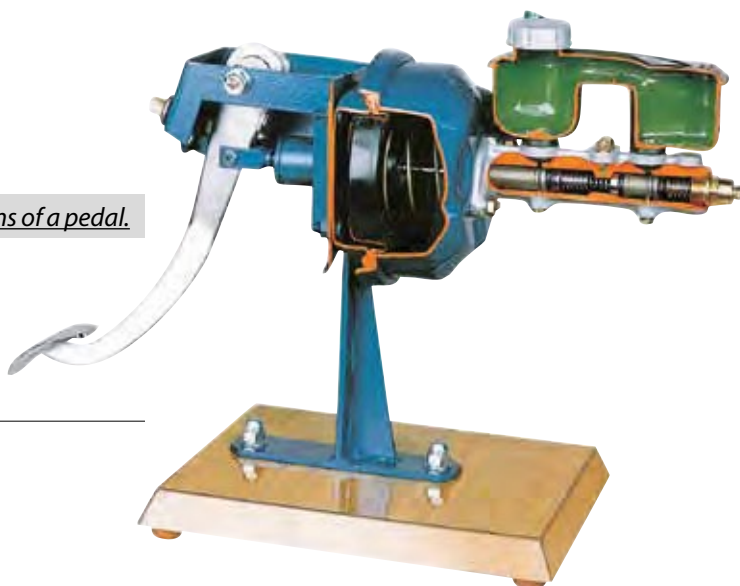
VB 12300M VACUUM SERVOBRAKE (on base) - manual

Section of a diaphragm servo brake used for light vehicles, complete with double circuit brake pump.

It is operated mechanically by means of a pedal.

Approx. weight and dim.:

Cm: 50x30x40h
Net Weight: kg 6
Gross Weight: kg 10



VB 12302

VB 12302M TANDEM MAIN BRAKE CYLINDER WITH PEDAL (on base) - manual

Approx. weight and dim.:

Cm: 35x15x25h
Net Weight: kg 2
Gross Weight: kg 3



Indicative picture for reference only

VB 12304

VB 12304M SINGLE-STAGE MAIN BRAKE WITH PEDAL (on base) - manual

Approx. weight and dim.:

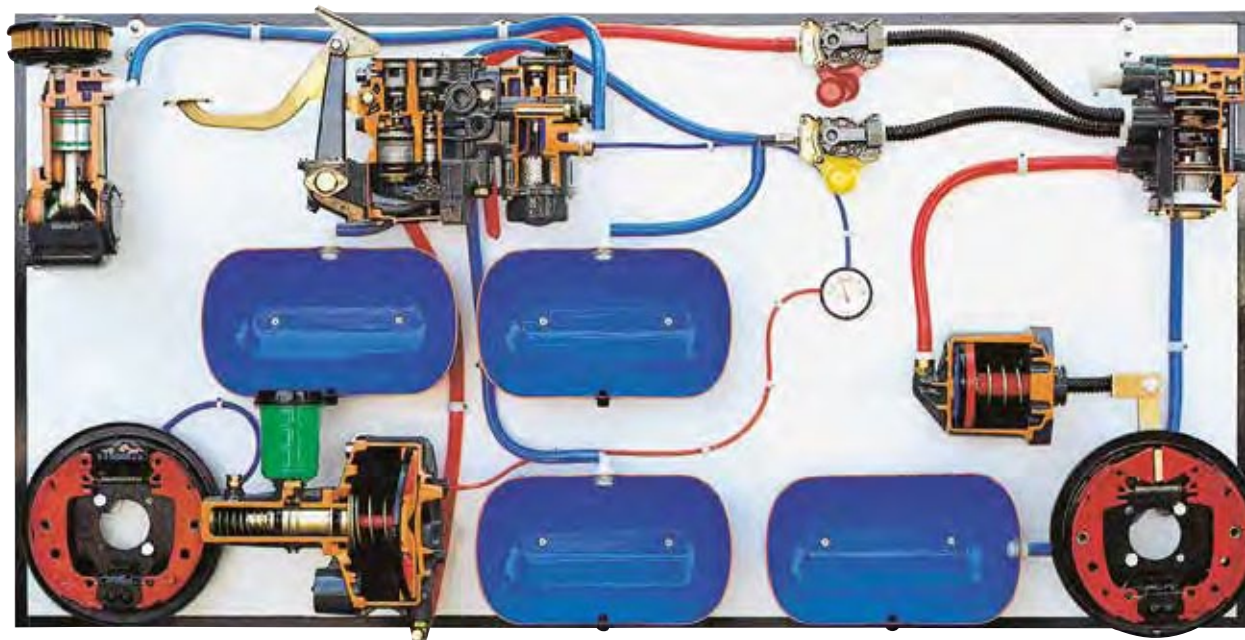
Cm: 30x15x25h
Net Weight: kg 1
Gross Weight: kg 2



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Many parts have been chromium, plated and galvanized for a longer life.*

VB 12065S HYDROPNEUMATIC BRAKING SYSTEM (on panel) - static

Wall panel showing the hydro-pneumatic braking elements of a truck (tractor-trailer) complete with: air compressor, triplex Marelli distributor with adjusting and control unit, pressure brake booster, tractor-trailer coupling joint, hydraulic control braking element, mechanical and air control braking element for parking braking, servo-distributor valve for the trailer, no. 4 air reservoirs (3 for the tractor). All elements are connected with rubber pipes of different colours to distinguish the various circuits.



Approx. weight and dim.:

Cm: 170x35x105h
Net Weight: kg 60
Gross Weight: kg 100

VB 12070S PRESSURE SERVOBRAKE (on base) - static

Section of a piston servo brake used for trucks and complete with brake pump.



Approx. weight and dim.:

Cm: 30x30x40h
Net Weight: kg 6
Gross Weight: kg 10

These cutaway models are carefully sectioned for training purposes, professionally painted with different colours to better differentiate the various parts.
Many parts have been chromium, plated and galvanized for a longer life.

VB 12065

VB 12070

Indicative picture for reference only

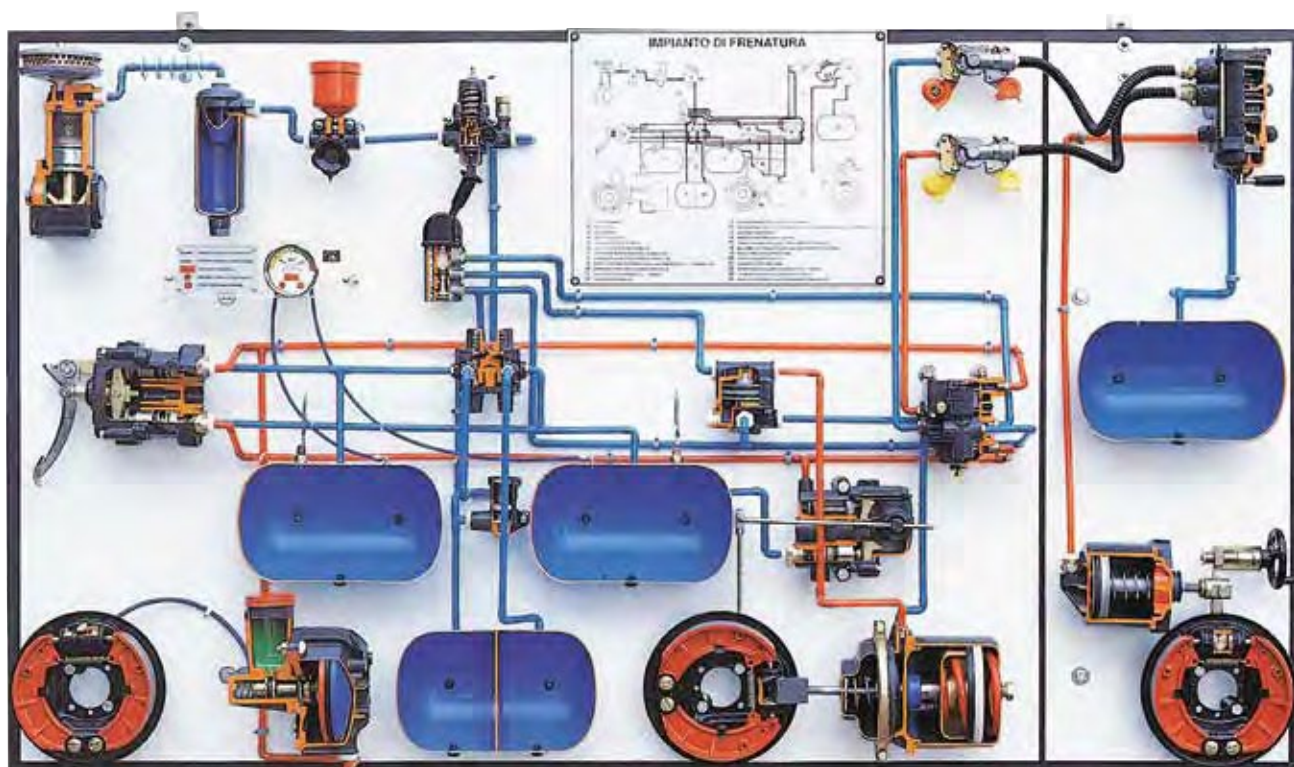
VB 12170S MOTOR/TRAILER AIR BRAKING SYSTEM WITH DOUBLE SPRING BRAKING UNIT WITH CHUCK DEVICE (on wall panel) -static

VB 12180S MOTOR/TRAILER AIR BRAKING SYSTEM WITH DOUBLE SPRING BRAKING UNIT WITH CHUCK DEVICE (on stand with wheels) -static

Wall panel including all the elements of a compressed air braking system. It is complete with all connection circuit components and everything else required for the teaching purposes this panel is intended for. The connection pipes are painted in different colours, in order to differentiate the different circuits. This panel is a must-have training instrument allowing the teacher to clearly describe and teach the running of a modern braking system. The hydro-pneumatic braking system and the braking system with the olive pivot are displayed.

The components shown are:

- compressor
- heating coil
- air purifier
- anti-freeze system
- pressure regulator
- pressure gauge
- safety valve tank
- front brakes air tank
- rear brakes air tank
- spring brake and trailer tank
- pressure reducer
- duplex distributor
- double-governor servo-distributor
- triple governor servo-distributor with built-in pulsed signalman
- jackknife
- charge-pressure modulator
- pneumo-hydraulic pump with braking element
- low pressure indicator
- double-spring wedge-shaped braking element
- ISO coupling joints
- servo-auto distributor
- auxiliary trailer tank
- olive pivot braking element
- parking brake trailer device
- service tank



Indicative picture for reference only

VB 12170S

Approx. weight and dim.:

Cm: 220x36x140h
 Net Weight: kg 95
 Gross Weight: kg 135

VB 12180S

Approx. weight and dim.:

Cm: 220x36x140h
 Net Weight: kg 110
 Gross Weight: kg 150

VB 12190S AIR BRAKING SYSTEM FOR TRUCKS WITH ABS/ASR (on wall panel) **-static**

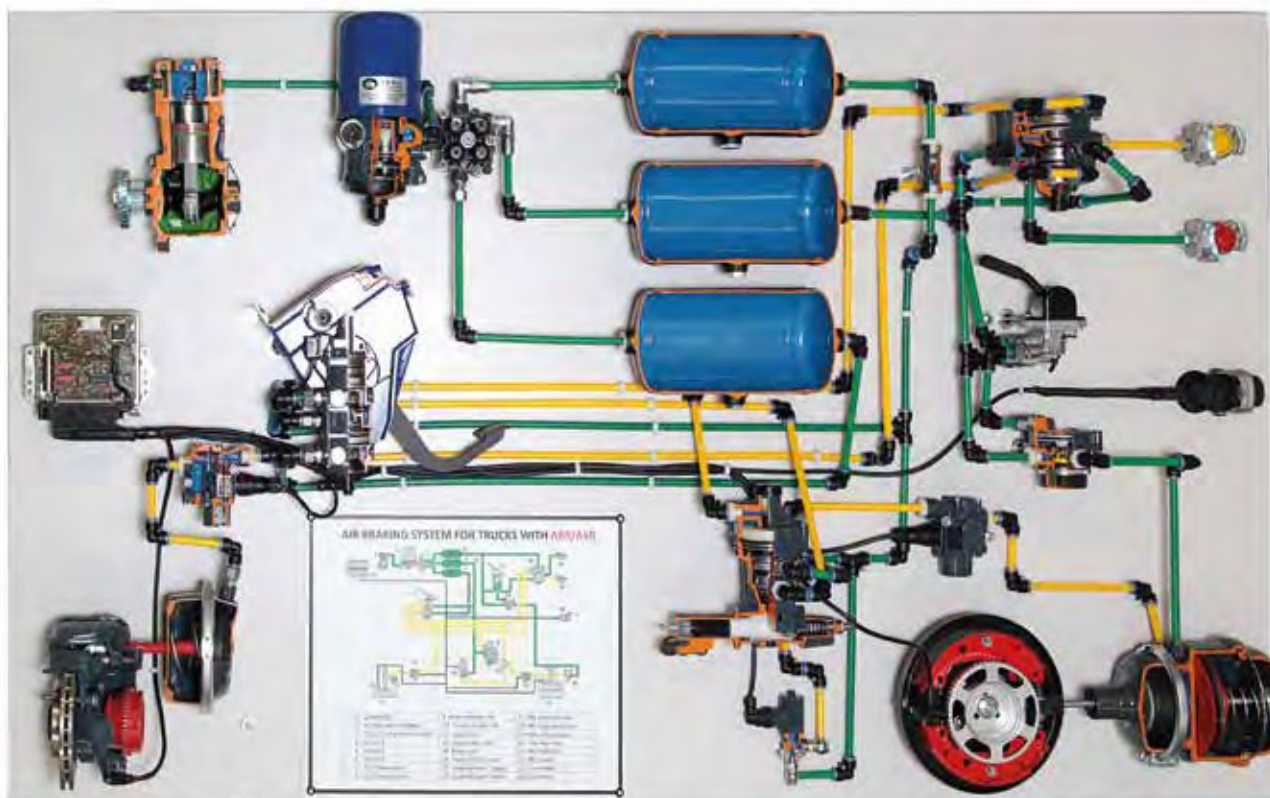
VB 12195S AIR BRAKING SYSTEM FOR TRUCKS WITH ABS/ASR (on stand with wheels) -static

Wall panel including all the elements of a compressed air braking system. It is complete with all connection circuit components and everything else required for the teaching purposes this panel is intended for. The connection pipes are painted in different colours, in order to differentiate the different circuits. This panel is a must-have training instrument allowing the teacher to clearly describe and teach the running of a modern braking system. The hydro-pneumatic braking system and the braking system with the olive pivot are displayed.

The components shown are:

- compressor
- air dryer with unloader
- four-circuit protection valve
- 3 tanks
- foot brake valve
- load sensing valve
- brake chamber VA
- three-stop cylinder HA
- check valve
- hand brake valve
- relay valve
- trailer control valve
- coupling head "supply"
- coupling head "brake"
- ABS solenoid valve
- ABS plug connection
- ASR solenoid valve
- two-way valve
- ABS/ASR-ECU
- ABS sensor
- drum brake
- disc brake

Indicative picture for reference only



VB 12190S

Approx. weight and dim.:

Cm: 220x36x140h
Net Weight: kg 110
Gross Weight: kg 150

VB 12195S

Approx. weight and dim.:

Cm: 220x36x140h
Net Weight: kg 125
Gross Weight: kg 165

VB 12190 - VB 12195



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