ConsuLab
TRAINING AIDS
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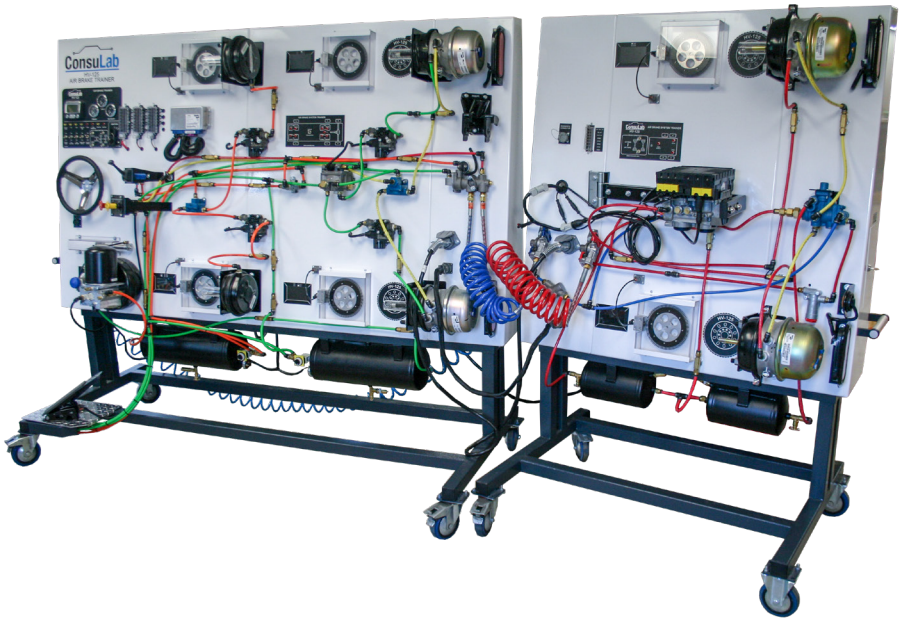
HV-125-BWP (52877-BWP)

AIR BRAKE DRIVING SIMULATOR



The ConsuLab HV-125-BWP is everything you've always dreamed about when teaching air brakes systems. Imagine being able to take the entire class out for a road test and watch live data on a scan tool and see what happens when you drive on dry pavement, during full throttle acceleration and a panic stop. Simulate a drive on an icy road and start to lose control, and you will get to demonstrate how the ABS and ESP functions. Students get to hear, feel and see how all the electronic control valves react during these ABS ESP and ATC events. You can demonstrate trailer sway, you can demonstrate traction control events.

The trainer is built to be used as a live driving simulator in front of a whole class as well as for learning the foundation air brake system, performing electrical and pneumatic diagnosis with the aid of fault boxes, with optional defective components. The trainer has been designed around the FMVSS121 standard and allows students perform their pre-trip inspections. All components are D.O.T. approved.

Optional foundation brake wheel ends with a drum front axle, spring brake disc and spring brake drum configuration give full coverage of how the mechanical foundation section of the brake's functions. Students can see the S-cams move, you can watch the slack adjusters adjust, you can over or under adjust the brakes and see the results on the foundation disc and drum cutaways.

Individual wheel speeds for all wheels are shown on individual screens throughout the trainer that allow every student in class to see what is going on during the different driving events.

A real accelerator pedal and brake pedal are at the heart of the system. The carefully designed driver interface with pedals, a mock steering wheel, and all of the controls that you are used to using in the truck are at your fingertips and positioned the instructor does not have their back turned to the class to operate them. The PP valve, trailer hand valve, primary, secondary and applied air gauges are included along with a murphy gauge showing live data from the CAN bus including vehicle speed.

The ignition key switch and the datalink connector are included so that you can connect your scan tool for live data and codes for diagnosis of the inserted faults. The pedals are mounted to an easily removable diamond plate aluminum panel to allow your students to see the details of the foot valve porting, fitting and tube configuration. The driving simulation reacts in real time to inputs from the driver control section. If you don't start the engine and press on the accelerator, nothing happens. If you start the engine and then try to drive off without removing your parking brakes, nothing happens.

If you release the parking brakes but do not supply the trailer, the truck will start driving forward but will be dragging the trailer behind you. Once driving it is possible reach a maximum speed of 55mph (88kph). All of the braking and acceleration inputs are proportional, this means that if you brake just a little bit you will slow down at a slower rate of deceleration than if you stomp the brake pedal. If you happen to apply the park brakes while driving, you will brake at maximum capacity of the system.

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Main Features

Indicator lights on the dashboard let you know if you have an ABS or ATC light lit. There is a steady state switch which allows the instructor or student to lock in all parameters and leave the system running for an indefinite amount of time – it's like a cruise control but for pedagogical purposes, it lets you lock everything in and then take the time to demonstrate the functions of the system to your students in detail.

There are 12 electrical faults and 6 pneumatic faults for the tractor and 6 electrical and 3 pneumatic faults for the trailer. All faults can be diagnosed and found by students and proved out through testing. The driver area is located at left hand side of the trainer.

There are two pressure gauges located in the operation area. One is for the shop air (140 PSI minimum) that you have connected to the trainer, and the other is to show regulated air input to the trainer. The second gauge, showing the regulated air input to the trainer, is so that you can demonstrate different system functions like governor cut-in and cut-out pressures. There is also a dedicated pneumatic cylinder to represent the unloader valve actuation for governor cut-out and cut-in.

Each individual wheel has its own variable reluctance WSS wheel speed sensor the same as a real truck. The air gap can be adjusted on each sensor If the air gap is too great you will immediately get a trouble code and a light on the dash.

Each of the wheels is individually driven by a stepper motor and will react live to different inputs from the driver along with the road conditions and the air that is applied to the braking system. You can watch and see the speed changes of the individual wheels on the video displays located at each wheel, while you drive down the road.

Each wheel has its own brake chamber on the board without a slack adjuster. The rod from each brake chamber is protected by a transparent cover.

The tractor system is a Bendix EC-60 premium system configured as 4S4M, this means 4 sensors and 4 modulator valves. There is also a traction relay valve for the traction control system to function. There are extra wheels visually demonstrated on the trainer to show the second axles on both the truck and trailer boards.

The trailer system is a Wabco RSSplus with ABS and rollover protection electronic stability control. This is a complete standalone system that can function regardless of whether or not the truck is equipped with an ABS ATC system.

The RSSplus is unitized and includes all modulator valves, yaw rate and g-force sensors as well as the ECU in one unit. The unit is mounted to a specially designed support, with a hinge, so that you can "sway" the trailer as you are driving down the road and watch the air system react differently.

The boards are equipped with brake lights on both the tractor and the trailer. An industry standard 7-way connector connects both the tractor and trailer together. The RSSplus module communicates with the tractor over the powerline in the 7-way cord.

The EC-60 Bendix ECU communicates with the murphy gauge and a scan tool (not included) through the J1939 multiplex network. The switchable faults are located in the ABS/ATC and in the multiplex system.

The trainer requires a regular 120VAC 15A outlet, and 140PSI air, to operate.

Industry standard glad-hands are used to connect the tractor and trailer together.

Many of the components are mounted to the board using thumbnuts so that the components may be removed without any tooling.

All air connections are made using D.O.T. approved push-to-connect fittings and tubing so that the components may be easily removed, replaced with faulted components. This also allows testing for pressure at multiple locations.

The Bendix AD-IS air dryer is used that includes a wet tank and safety valve for over pressure protection. This means that there are just two primary and secondary tanks for the main system.

The primary and secondary tanks have drain valves. All tanks are equipped with safety valves set at the industry standard 150psi.

Key connections are equipped with auto-exhausting shutoff valves to facilitate testing and measurement for troubleshooting and problem solving the various inserted system faults.

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Educational Advantages

- The learner can easily observe the various functions of the trainer and the interaction of the tractor and trailer
- The air brake trainer fits through standard classroom doorways and is simple to set up
- The wheel speeds for all wheels are shown on individual screens throughout the trainer
- The operator controls are positioned so that the operator does not obscure the operation of the system
- Many of the components are mounted to the board using thumbnuts so that the components may be removed without any tooling
- Faulted components are supplied that can be installed for diagnosis training

Applications

- The tractor system is a Bendix EC-60 premium system configured as 4S4M, this means 4 sensors and 4 modulator valves
- The trailer system is a complete standalone system with Wabco RSSplus, ABS and rollover protection electronic stability control
- The Bendix AD-IS air dryer is used that includes a wet tank and safety valve for over pressure protection. This means that there are just two primary and secondary tanks for the main system
- The primary and secondary tanks have drain valves. All tanks are equipped with safety valves set at the industry standard 150psi

Optional Equipment

52890-1 HV-124-DISC, Trailer Disc with Spring Brake for HV-125
52890-2 HV-124-DRUM, Trailer Drum with Spring Brake for HV-125
52890-3 HV-124-FDRUM, Front Tractor Drum with no Spring Brake for HV-125
30255-7 Set of Breakout Boxes with T-Harnesses for Premium
30256 Set of Defective Components for HV-125
93788 NEXIQ USB Link 2 Communication Interface

Physical Specification

- Tractor Panel Dimensions: 86 x 69 x 32 in (218.4 x 175.3 x 81.3 cm) / 90 x 75 x 48 in (254 x 190.5 x 121.9 cm) (w/packaging)
  Trailer Panel Dimensions: 52 x 69 x 32 in (132.1 x 175.3 x 81.3 cm) / 56 x 75 x 48 in (142.2 x 190.5 x 121.9 cm) (w/packaging)

- Tractor Panel Weight: 744 lb (338.1 kg) / 844 lb (383.64 kg) (w/packaging)
  Trailer Panel Weight: 450 lb (204.5 kg) / 510 lb (231.8 kg) (w/packaging)