

## Pneumatic braking system function testers

### 1. Air test case 435 002 007 (WABCO)



Because of the comprehensive equipment it contains, WABCO's Test Cabinet 435 002 007 0 allows quick and accurate testing of pneumatic braking systems in keeping with the guideline on special brake tests on vehicles.

It contains 6 calibrated test pressure gauges with connecting hoses each 6.5 m long, hose couplings for measuring single-line and two-line braking system plus a three-way cock unit for closing the supply line or for airing/venting the trailer control line. Miscellaneous parts include some screw-type adapters, washers, thrust rings, O-rings plus 2 test clips to serve as adapters for the test connections with M 8 × 1 thread sometimes used before.

Pressure measuring devices are precision instruments. They should be handled with care, avoiding high impact loads. The calibration stickers have compulsory expiry dates on them.

### 2. LSV tester 435 008 000 0 (WABCO)



LSV tester 435 008 000 0 can be used to easily test and adapt the settings of automatic load-sensing valves (LSV) without the need for other persons helping. The two precision control valves allow to set the required brake pressure as well as the air spring bellows pressure for load simulation (pressure gauges 1 and 2) which are then supplied or relieved by opening or closing the stop cocks. Pressure gauge 3 shows the actual brake pressure delivered.

The tester is also an excellent means of testing braking system of trailers without a towing vehicle. In that case, use the precision control valves to set the supply line and control line pressures.

### 3. Trailer tester 899 709 092 2 (WABCO)



Use tester 899 709 092 2 for checking mechanically controlled load-sensing valves or for verifying and setting the trailer's advance pressure. The appliance replaces a second person otherwise needed to actuate the brake. To do a test, install the device between either the yellow hose coupling of the towing vehicle or the air reservoir of the building's air system and the yellow hose coupling of the trailer. Use the precision control valve to accurately set the brake pressure to be supplied.

### 4. WABCO test plug for checking the ABS plug connection



To check the towing vehicle's ABS socket (ISO7638) and trailer monitoring equipment (warning lamp and indicator lamp), WABCO provides the test plugs required to test the ISO connection even without a trailer being present. The following parts are involved:

- ABS test plug **446 007 316 0** for checking the 5-pin ABS socket
- 24 N test plug **446 007 310 0** for testing the indicator lamp via the 24 N socket

### 5. Test bench for braking systems 435 197 000 0 (WABCO)



The test bench is intended to test the functions of devices of pneumatic brake systems as well as of electropneumatic braking and control equipment. By practically arranging or connecting up the devices, pressure gauges and reservoirs along the test bench, the devices under test can be set to simulate their normal use and purpose in the vehicle, thus making perfect testing of their function possible. WABCO also provides test instructions closely adapted to the technicalities of the test bench.

Brake servicing shops not only replacing but also repairing braking equipment are subject to a statutory obligation to have this or a similar test bench as part of their equipment.

## Hydraulic braking system function testers

### 1. Pressure tester for hydraulic systems



Continental-Teves pressure tester  
(brake fluid specification)

The manufacturers of hydraulic braking systems provide pressure testers for low and high pressure testing and the testing of stop light switches and foot valves. The ATE pressure tester shown below features both a low pressure gauge (0 - 10 bar) and a high pressure gauge (0 - 250 bar). An integrated regulator valve automatically switches off the low pressure gauge whenever the pressure measured goes up beyond the gauge's dial range.

**Remark:**

Differently colour-coded testers are available for the different media (brake fluid and mineral oil). Avoid getting the confused under all circumstances. Failure to comply would render useless both the tester and the entire braking system.

### 2. Pedal lock (pedal rest)

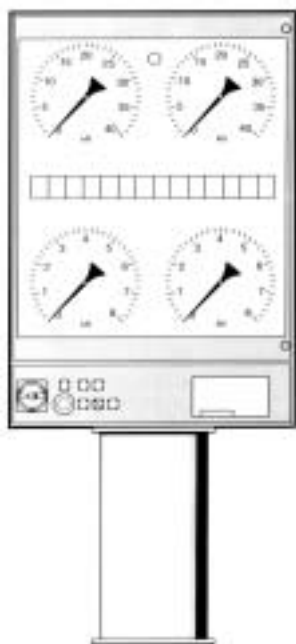
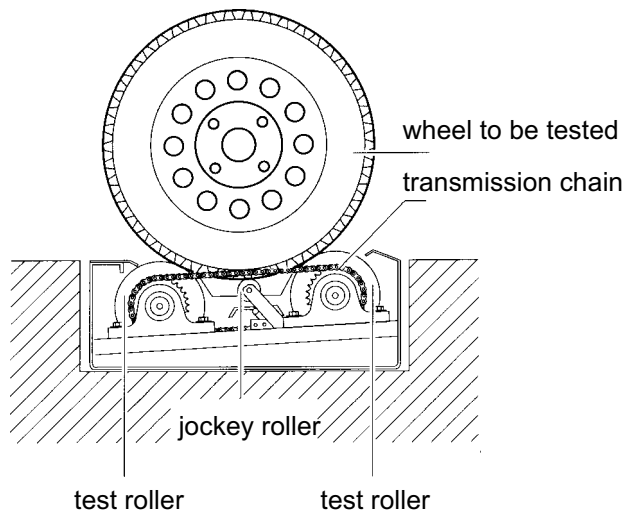


Pedal lock (Continental-Teves)

To avoid unintended changes of the pedal setting negatively influencing the measuring result, a pedal rest must be used for leak testing. A pedal rest can be a useful gadget for other test or setup work, too.

To perform effectiveness tests on wheel brakes (determining the retardation  $z$  or the slowing down of the vehicle  $a$ ), brake repair shops need the following additional test equipment

### Roller dynamometer



Dynamometers - normally roller dynamometers to test commercial vehicles - are used to verify the efficiency of the wheel brakes. Different sets of rollers allow the right and left brake to be tested separately.

As the vehicle enters the dynamometer, it pushes down the jockey rollers which starts the drives of the sets of rollers. Likewise, as the vehicle leaves the dynamometer, the jockey rollers snap back up and switch off the sets of rollers.

To avoid damage to the tyres of the vehicle or to the dynamometer, anti-blocking equipment (slip-controlled switch-off by having the jockey rollers measure the speed) usually switches off the rollers at the blocking threshold. The system displays the brake force measured at the time of slip-controlled switch-off.

Newer dynamometer models often provide some extra options such as an integrated weighing unit, mileage counting for tachograph testing, radio or infrared controlled transfer of braking pressure etc.

Dynamometers can have conventional dial gauges or a computerised display and diagnosis station. The latter allow the printing of test results.

### Plotting deceleration meter

Plotting deceleration meters measure how much the vehicle slows down in road tests. They are normally based on the spring/mass principle: when braking, a mass attached to a spring keeps moving in the travelling direction. The degree of its deflection is taken to represent the deceleration and is plotted onto a chart.

Some units feature an extra measuring input that a pedal force sensor or a pressure sensor can be attached to to either measure (and plot) the pedal actuation force or the braking pressure supplied.

To measure the deceleration, the device is placed on a non-skid surface (e.g. a rubber mat in the front-seat passenger's foot pit), turned to face in the travelling direction and horizontally aligned. Braking starts at the specified test speed (e.g. 40 km/h) and the deceleration is measured and plotted.

### Please note



MAHA deceleration meter, type VZM 100 with pedal force meter and manual trigger

To avoid hazardous road traffic situations, licenced workshops are allowed to use plotting deceleration meters for special testing only if the design or dimensions of the vehicle under test do not allow the vehicle to be tested on a roller dynamometer.

## Instructions for Repairing Braking Equipment

### Introduction

If damaged components of a pneumatic braking system are repaired, the spare parts specified to be wearing parts must be replaced. Apart from the broken components, all sealing and retaining elements as well as pressure springs below 2.2 mm are considered wearing parts.

### Installation instructions

When assembling a unit all attachments, connections, levers etc. must be installed with regard to the variant being built.

Furthermore, prior to assembling the valves, their metal friction areas and sealing elements are to be lubricated as specified in the table of lubricants below.

**Table of Lubricants**

Order number	Quantity	Properties / application	Name	Application
830 502 010 4 830 502 011 4 830 502 019 4	500 g 10 kg 50 kg	Lubricant for device sealing elements and friction surfaces <b>Working medium: compressed air</b> <b>Temperature range: -30°C ... +100°C</b>	LB 0 (West 1)	Standard Lubricant
831 502 065 4 831 502 062 4 831 502 064 4	5 g 5 kg 50 kg	Lubricant for device sealing elements and friction surfaces <b>Working medium: compressed air</b> <b>Temperature range: -40°C ... +100°C</b>	RHF 1	Standard Lubricant
830 502 072 4 830 502 070 4	8 g 50 kg	Lubricant for device sealing elements and friction surfaces under high operating temperatures <b>Working medium: compressed air</b> <b>Temperature range: -30°C ... +150°C</b>	Staburags GBU-Y 131	e.g. for unloader valve 975 3.. ... 0
830 502 074 4 830 503 046 4 830 503 047 4	8 g 500 g 5 kg	Silicone oil lubricant for device sealing elements and friction surfaces under high operating temperatures <b>Working medium: compressed air</b> <b>Temperature range: -50°C ... +180°C</b>	Unisilikon GL 301	421 4 .. ... 0 432 4 .. ... 0 464 002 ... 0 934 7 .. ... 0
830 502 058 4	20 g	Silicone oil lubricant for device sealing elements and friction surfaces <b>Working medium: compressed air and brake fluid</b> <b>Temperature range: -40°C ... +150°C</b>	Paragon 50	970 051 ... 0
830 502 073 4 830 502 056 4	10 g 750 g	Silicone oil lubricant for device sealing elements and friction surfaces <b>Working medium: brake fluid</b> <b>Temperature range: -40°C ... +150°C</b>	Unisilikon L 250 L	432 001 . . . 0 432 199 . . . 0 470 051 114 0 470 051 115 0 932 002 . . . 0
830 502 071 4 830 502 029 4 830 502 009 4	5 g 50 g 5 kg	Lubricant for device sealing elements and friction surfaces <b>Working medium: brake fluid</b> <b>Temperature range: -30°C ... +120°C</b>	Rocol M-TC	828 ... ... 0 460 001 ... 0 470 051 ... 0 470 015 ... 0
830 502 017 4	1 kg	Lubricant for (metal-on-metal) friction surfaces and detachable connections. Removable with water. Not suitable for the lubrication of sealing elements. <b>Temperature range: -40°C ... +130°C</b>	ZH 215 (West VI)	Threads / screw connections
830 702 009 4 830 702 010 4	85 g 500 g	Lubricant for (metal-on-metal) friction surfaces and detachable connections. Anticorrosive for steel. Not suitable for the lubrication of sealing elements. <b>Temperature range: -40°C ... +1,100°C</b>	Copa Slip	975 700 ... 0
830 502 068 4 830 502 063 4	8 g 1 kg	Anticorrosive for gaps and cavities. Not suitable for the lubrication of sealing elements. <b>Temperature range: -40°C ... +80°C</b>	Staburags NBU 30 PTM	Sensors

**Testing**

Following assembly, the device functions are to be tested compliant to our test instructions. Prerequisite: a device test bench.