

# Test instruction

**i** Prior to testing read carefully the safety instructions.

## Safety Instructions

**! WARNING**

Testing the device on the test bench is to be made only by qualified personnel with a specific system knowledge.

Always start testing only after you have read and understood all information required for testing.

Test the device only on a calibrated test bench.

In case of doubt, use test values specified by the vehicle manufacturer.

While testing the device implicitly observe this test instruction.

**! CAUTION**

Comply with internal as well as national accident prevention regulations.

Unlock screws, hoses and equipment parts only when the respective lines of the test bench are vented.

### Test instruction for device 461 318 ... 0

100 (without proximity switch)	491	497	550
485	492	498	551
486	493	501	552
488	494	502	
489	495	503	
490	496	504	


### Symbols and signal terms

**! WARNING**

Possible danger: Any non-compliance can result in severe personal injuries or death.

**! CAUTION**

Possible danger: Any non-compliance can result in minor or medium severe personal injuries.

- Handling
- Enumeration
- i** Instructions, explanations, information, tips
-  Gauge indication

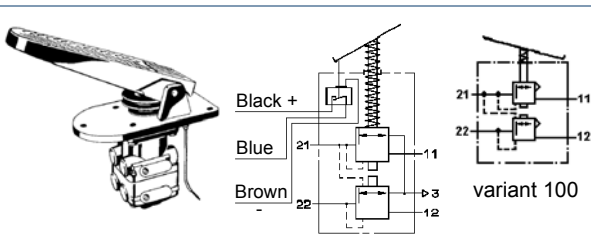


Fig. 1 + 2 Brake valve 461 318 ... 0, Functional symbol

**i Necessary equipment/tools**

- Test bench 435 197 000 0 or an adequate testing equipment
- Adequate equipment:
  - for clamping the brake valve,
  - for actuating the pedal with degree graduation.

**i Additional documents:**  
(see [www.wabco-auto.com](http://www.wabco-auto.com) => INFORM)

- Test Values 2/2:  
to be found by entry of the product number in INFORM
- Test Bench - Operating Instructions:  
435 197 000 0
- General Repair and Test Hints:  
820 001 074 3 (de)  
820 001 075 3 (en)  
820 001 076 3 (es)  
820 001 077 3 (fr)  
820 001 078 3 (it)

**Check sequence**

- i** Perform test procedure as per specified sequence  
Find test values P1 to P14 and G1 to G10 in document "test values 2/2".  
Reservoir pressure is 10 bar max.

- Adjust proximity switch (adjusting screw) for the pedal without clearance.
- i** Here the tappet must not have made any movement.
- Adjusting screw with M = 50 Nm.

**CAUTION**

Before starting any test ensure that cut-off cocks are in their correct normal position (see table 1).

Cock	A	B	C	D	F	L	V	2	3	4	6	7	11	12	21	22
on	x												x		x	
off		x	x	x	x	x	x	x	x	x	x	x		x		x

Table 1: Normal position of cut-off cocks on the test bench

**1. External evaluation**

- Inspect device for external visible damage.
- Check all ports of the device for free passage by visual inspection.

**2. Preparations**

- Fix device in clamping equipment.
- Connect device to test bench ports (see fig. 3).

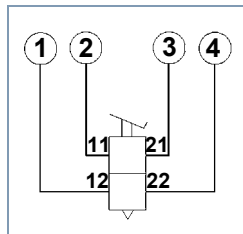


Fig. 3 Test bench ports

**CAUTION**

Make sure that plug-in connections on test bench and device are safely plugged.

**3. Check tightness**

**WARNING**

Never install an untightened brake valve on the vehicle.

**3.1 Exhaust**

- i** From a non-actuated device no air must exceed from the exhaust.
- Vent ports 11 and 12 with P1.
  - Fully operate device several times.
  - Wait until excess pressure has decreased.
  - Check exhaust of the device for tightness.
  - i** No leakages admissible.

**3.2 Complete device**

- Fix degree scale to device.
- i** 0-position of the pedal means 0-position of the graduation at the same time.
- Adjust pedal to G1 (stop within device).
- ⊗ Gauges 3 and 4 must indicate P2.
- Cover complete device with soap and check tightness.
- i** No leakages admissible.  
With soap bubbling the device is not tight.

- Readjust pedal to 0°.
- ⌚ Gauges 3 and 4 must indicate 0 bar.

#### 4. Obtain maximum pressure

- Adjust pedal to G1 (stop within device).
- i** Pressure must increase immediately.
- ⌚ Gauges 3 and 4 must indicate P2.
- Readjust pedal to 0°.
- ⌚ Gauges 3 and 4 must indicate 0 bar.

#### 5. Graduability

- i** In all pressure scopes incremental steps of max. 0.2 bar must be possible.

#### 6. Check pressure increase

- Operate pedal several times.
- ⌚ Gauges 3 and 4 must indicate immediate pressure increase resp. decrease.
- i** In accordance with the type of device, one circuit must have predominance.

#### 6.1 Check cut in point

- i** Test step not required on variant 100.
- Adjust pedal to G2.
- i** Proximity switch: ON

#### 6.2 Check sudden pressure increase

- Adjust pedal to G3.
- ⌚ Gauge 3 must indicate P3.
- Gauge 4 must indicate P4.

#### 6.3 Distance until venting of P5/P6

Carry out test step only on variants 488, 489, 492, 494, 501, 502, 504, 550, 551 and 552.

- Adjust pedal to G4.
- i** Pressure must increase immediately.
- ⌚ Gauge 3 must indicate P5.
- Gauge 4 must indicate P6.

#### 6.4 Distance until venting of P7/P8

- Adjust pedal to G5.
- i** Pressure must increase immediately.
- ⌚ Gauge 3 must indicate P7.
- Gauge 4 must indicate P8.

#### 6.5 Distance until venting of P9/P10

- Adjust pedal to G6.
- i** Pressure must increase immediately.
- ⌚ Gauge 3 must indicate P9.
- Gauge 4 must indicate P10.

#### 6.6 Distance until venting of P11/P12

Carry out test step only on variants 488, 489, 493, 492, 494, 501, 502, 503, 504, 550, 551 and 552.

- Adjust pedal to G7.
- i** Pressure must increase immediately.
- ⌚ Gauge 3 must indicate P11.
- Gauge 4 must indicate P12.

#### 6.7 Check cut out point

- i** Test step not required on variant 100.

- Adjust pedal to G8.
- ⌚ Gauge 3 must indicate P13.
- Gauge 4 must indicate P14.
- i** Proximity switch: OFF

- Re-adjust pedal to 0°.
- ⌚ Gauges 3 and 4 must indicate 0 bar.

#### 7. Circuit failure

##### 7.1 Failure of circuit 1

- Vent port 11.
- ⌚ Gauge 1 must indicate 0 bar.

Carry out test step only on variants 485, 488, 501, 502, 503, 504, 550, 551 and 552.

- Adjust pedal to G9.
- i** Proximity switch: ON

Set pressure point:

- Release nut.
- Screw hexagon bolt up to the pedal.
- Counter hexagon bolt with nut with M = 4 Nm.
- Re-adjust pedal to 0°.
- ⌚ Gauges 3 and 4 must indicate 0 bar.
- Adjust pedal to G9.
- i** The pressure point is now tangible.

- Adjust pedal to G10.
  - ⌚ Gauge 3 must indicate 0 bar.
  - Gauge 4 must indicate P2.
  - i** Proximity switch: ON
- Re-adjust pedal to 0°.
  - ⌚ Gauges 3 and 4 must indicate 0 bar.

## 7.2 Failure of circuit 2

- Vent port 12.
- Vent port 11 with P11.
  - ⌚ Gauge 2 must indicate 0 bar.
  - i** Proximity switch: OFF.
- Adjust pedal to G10.
  - ⌚ Gauge 3 must indicate P2.
  - Gauge 4 must indicate 0 bar.
  - i** Proximity switch: ON
- Re-adjust pedal to 0°.
  - ⌚ Gauges 3 and 4 must indicate 0 bar.

**i** The check of the proximity switch can only be carried out in the vehicle.

## 8. Completion of test

- Vent port 11 to 0 bar.
  - ⌚ Gauges 1 and 2 must indicate 0 bar.
  - i** Proximity switch: OFF

Carry out only on variant 490:

- Check the electrical connections 1, 2 and 3 within the plug casing against ground.



### **CAUTION**

*Disconnect pipe connections only after having exhausted the device to 0 bar before.*

- Removing device from fixture.
- Cleaning device.