

Test instruction

i Prior to testing read carefully the safety instructions.

Notes on Safety



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

Keep company's 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 devices 461 499 ... 0

004
005
016
024

Symbols and Signal Words




WARNING

Possible hazard situation: Disregarding it may cause grave personal injuries or death.



CAUTION

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

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

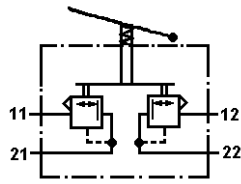
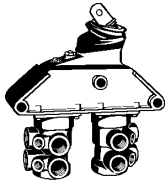


Fig. 1 + 2 Brake valve 461 499 ... 0, Functional symbol

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 lever with mm graduation.
- Soap suds and brush

i Additional documents:
(see 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 P15 (pressure in bar) and H1 to H6 (travel in mm) in document "Test values 2/2".
Reservoir pressure is 7.5 bar max.
Before starting any test ensure that cut-off cocks are in their correct normal position (see table 1).

Cock	A	B	C	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

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.

CAUTION

Make sure that the retaining rings are mounted correctly. The brake valve could otherwise explode while testing.

2 Preparations

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

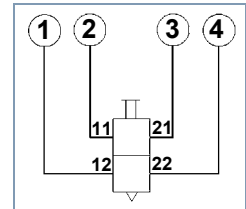


Fig. 3 Test bench ports

CAUTION

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

3 Adjustment

- Vent ports 11 and 12 with P1.
- Turn adjusting screw clockwise into device, until gauge 3 and 4 indicate P3.
- Release adjusting screw until gauge 3 and 4 indicate 0 bar.
- Turn adjusting screw anticlockwise with 3 rotations and counter it with M = 15 Nm.
- Remove bellows.

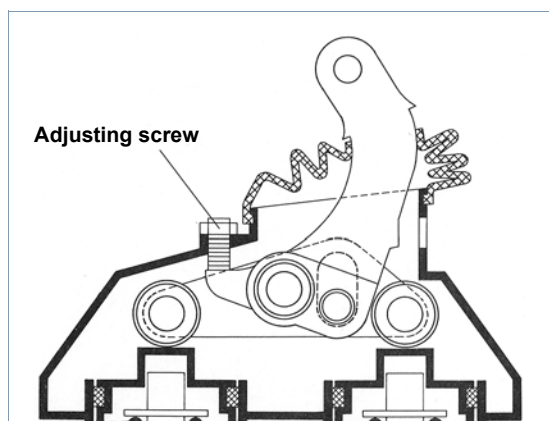


Fig. 4 Brake valve 461 499 - Cross-section, Position of the adjusting screw

4 Check tightness



WARNING

Never install an untightened brake valve on the vehicle.

4.1 Exhaust

- i** From a non-actuated device no air must exceed from the exhaust.
- Fully operate device several times.
 - ⌚ Gauges 1 and 2 must indicate P1.
- Wait until excess pressure has decreased.
- Check exhaust of the device for tightness.
 - i** No leakages admissible.

4.2 Complete device

- Operate lever H1 (stop within the 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.
- Re-adjust lever to 0 mm.
 - ⌚ Gauges 3 and 4 must indicate 0 bar.

5 Obtain maximum pressure

- Operate lever H1 (stop within the device).
 - i** Pressure must increase immediately.
 - ⌚ Gauges 3 and 4 must indicate P2.

- Re-adjust lever to 0 mm.
 - ⌚ Gauges 3 and 4 must indicate 0 bar.

6 Graduability

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

7 Check pressure increase

- Operate lever 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.

7.1 Check sudden pressure increase

- Operate lever with H2.
 - ⌚ Gauge 3 must indicate P4.
 - ⌚ Gauge 4 must indicate P5.

If pedal travel has not been achieved, adjust lever travel via adjusting screw.

- Turn adjusting screw anticlockwise and counter it with $M = 15 \text{ Nm}$.

7.2 Distance until venting of P6/P7

- Operate lever.
 - i** Pressure must increase immediately.
 - ⌚ Gauge 3 must indicate P6.
 - ⌚ Gauge 4 must indicate P7.

7.3 Distance until venting of P8/P9

- i** Carry out test step only on variant 004 and 005
- Operate lever with H3.
 - i** Pressure must increase immediately.
 - ⌚ Gauge 3 must indicate P8.
 - ⌚ Gauge 4 must indicate P9.

7.4 Distance until venting of P10/P11

- i** Carry out test step only on variant 004 and 005
- Operate lever.
 - i** Pressure must increase immediately.
 - ⌚ Gauge 3 must indicate P10.
 - ⌚ Gauge 4 must indicate P11.

7.5 Distance until venting of P12

- Operate lever with H4.
- i** Pressure must increase immediately.
- ☞ Gauges 3 and 4 must indicate P12.

7.6 Distance until venting of P2

- Operate lever H1 (stop within the device).
- i** Pressure must increase immediately.
- ☞ Gauges 3 and 4 must indicate P2.
- Re-adjust lever to 0 mm.
- ☞ Gauges 3 and 4 must indicate 0 bar.

8 Exhaust

- i** Carry out test step only on variant 004 and 005
- Operate lever with H6.
- ☞ Gauge 3 must indicate P14.
- ☞ Gauge 4 must indicate P15.
- Re-adjust lever to 0 mm.
- ☞ Gauges 3 and 4 must indicate 0 bar.

9 Circuit failure**9.1 Failure of circuit 1**

- Vent port 11
- ☞ Gauge 1 must indicate 0 bar.
- Operate lever with H5.
- ☞ Gauge 3 must indicate 0 bar.
- ☞ Gauge 4 must indicate P13.
- Re-adjust lever to 0 mm.
- ☞ Gauges 3 and 4 must indicate 0 bar.

9.2 Failure of circuit 2

- Vent port 12.
- Vent port 11 with P1.
- ☞ Gauge 2 must indicate 0 bar.
- Operate lever with H5.
- ☞ Gauge 3 must indicate P13.
- ☞ Gauge 4 must indicate 0 bar.
- Re-adjust lever to 0 mm.
- ☞ Gauges 3 and 4 must indicate 0 bar.

10 Completion of test

- Vent port 11.
- ☞ Gauges 1 and 2 must indicate 0 bar.
- Adjust set screw (setting dimensions see fig. 5) and secure it with threadlocking adhesives (low shear strength).

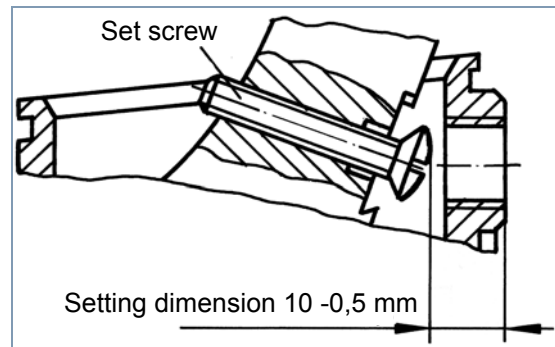


Fig. 5 Position of the set screw / Setting dimension

- Assemble bellows.

**CAUTION**

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

- Removing device from fixture.
- Cleaning device.