

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 461 307 ... 0

239	249	299	378	400	439	475
240	294	342	383	417	459	476
245	295	346	399	419	467	479

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

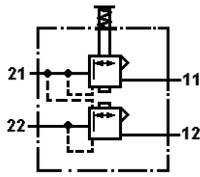


Fig. 1 + 2 Brake valve 461 307 ... 0, functional symbol

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 stem with mm graduation.

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 P12 and H1 to H6 in document "test values 2/2".
Reservoir pressure is 8.0 bar max. / 7.0 bar min.

! 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

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

2.1 Adjustment arrangement of brake valves

- Assemble the brake valve except for the insertion of fully assembled graduating piston and the flange of the whole actuation.
- Measure dimensions a and b (see fig. 3), dimension $C = b - a$.

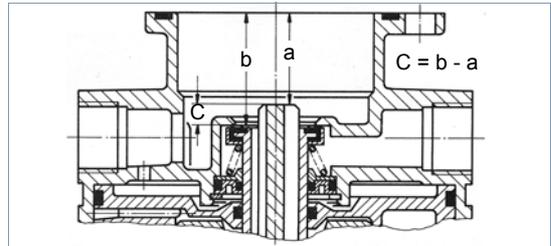


Fig. 3 Dimension C

- Adjust dimension $d = C + 0,8$ mm in the graduating piston by turning the set screw (see fig. 4).

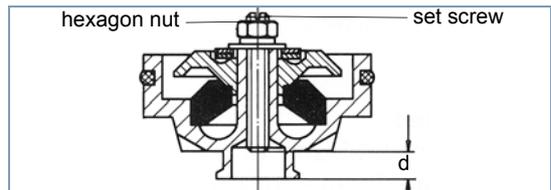


Fig. 4 Dimension d (Device with one rubber spring)

- Counter set screw by turning seizing the hexagon nut (see fig. 4).

- i** The adjustment levels off also at devices with longer graduation travel (two rubber springs), see fig. 5.

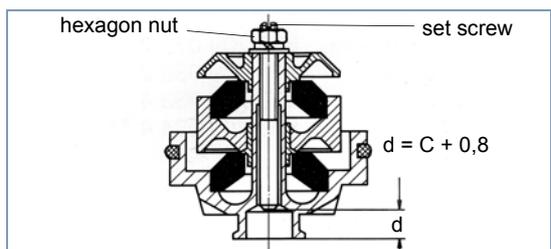


Fig. 5 Dimension d (Device with two rubber springs)

- Assemble the device except for the bellows.
- Fix device in clamping equipment.
- Connect device to test bench ports (see fig. 6).

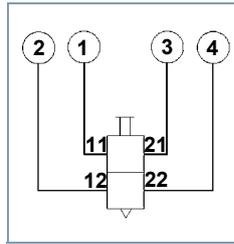


Fig. 6 Test bench ports

CAUTION

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

- Close one of the port 21 and 22 with screw plug M 22x1.5.

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.
- Operate stem several times.
- Wait until excess pressure has decreased.
- Check exhaust of the device for tightness.
- i** No leakages admissible.

3.2 Complete device

- Operate stem 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 stem to 0 mm.
-  Gauges 3 and 4 must indicate 0 bar.

4. Obtain maximum pressure

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

-  Gauges 3 and 4 must indicate 0 bar.

5. Graduability

- i** In all pressure scopes incremental steps of max. 0.3 bar must be possible.

6. Check pressure increase

- Operate stem 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 sudden pressure increase

- Operate stem with H2.
-  Gauge 3 must indicate P3.
Gauge 4 must indicate P4.

6.2 Distance until venting of P5/P6

- Operate stem with H3.
-  Gauge 3 must indicate P5.
Gauge 4 must indicate P6.

6.3 Adjust predominance

- i** Carry out test step only on variants 294, 295, 299, 378, 383 and 476.

The exact adjustment can be done by insertion or removing of compensation washers.

Use washers with the following composition:

Material: Steel

Surface protection: gal Zn 6 c yellow

Washer (approx. 0.4 bar pressure change-ment)	Diameter: 25 cm Thickness: 4 cm
Washer (approx. 0.05 bar pressure change-ment)	Diameter: 25 cm Thickness: 0.5 cm

- Adjust exact pressure with the cap (see fig. 7).
- i** Clockwise rotation: Pressure increase
Counter-clockwise rotation: Pressure decrease

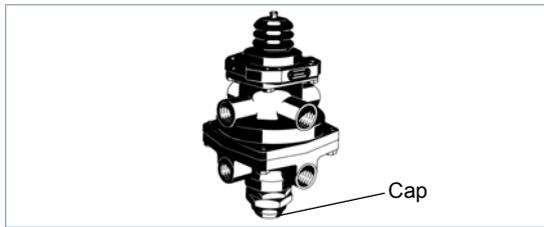


Fig. 7 Position of cap in the device

- Counter cap by turning the hexagon nut.
- Re-adjust stem to 0 mm.
- ⊗ Gauges 3 and 4 must indicate 0 bar.

6.4 Distance until venting of P7/P8

- Operate stem with H4.
- ⊗ Gauge 3 must indicate P7.
- ⊗ Gauge 4 must indicate P8.

6.5 Check predominance

- Operate stem with H3.
- ⊗ Gauge 3 must indicate P5.
- ⊗ Gauge 4 must indicate P6.

6.6 Distance until venting of P9/P10

- Operate stem with H5.
- i** Pressure must increase immediately.
- ⊗ Gauge 3 must indicate P9.
- ⊗ Gauge 4 must indicate P10.

6.7 Distance until venting of P11/P12

- Operate stem with H6.
- i** Pressure must increase immediately.
- ⊗ Gauge 3 must indicate P11.
- ⊗ Gauge 4 must indicate P12.

6.8 Distance until venting of P2

- Operate stem with H1.
- i** Pressure must increase immediately.
- ⊗ Gauges 3 and 4 must indicate P2.
- Re-adjust stem to 0 mm.
- ⊗ Gauges 3 and 4 must indicate 0 bar.

7. Circuit failure

7.1 Failure of circuit 1

- Vent port 11 to 0 bar.
- ⊗ Gauge 1 must indicate 0 bar.
- Operate stem with H1.
- ⊗ Gauge 3 must indicate 0 bar.
- ⊗ Gauge 4 must indicate P2.
- Re-adjust stem to 0 mm.
- ⊗ Gauges 3 and 4 must indicate 0 bar.
- Vent port 11 with P1.

7.2 Failure of circuit 2

- Vent port 12 to 0 bar.
- Operate stem with H1.
- ⊗ Gauge 3 must indicate P2.
- ⊗ Gauge 4 must indicate 0 bar.

8. Completion of test

- Vent port 11 to 0 bar.
- ⊗ Gauges 1 and 2 must indicate 0 bar.



CAUTION

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

- Remove device from fixture.
- Assemble bellows.
- Cleaning device.