

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 461 324 ... 0

000	015	028	040
001	016	031	041
006	017	032	042
007	018	034	043
008	019	036	045
009	022	037	046
011	026	038	520
012	027	039	


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

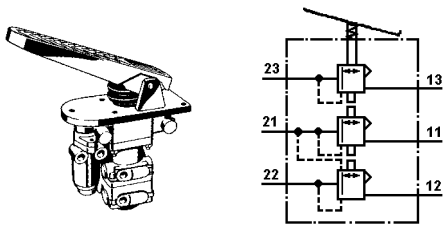


Fig. 1 + 2 Brake valve 461 324 ... 0, functional symbol

i Necessary equipment/tools

- Test Bench 435 197 000 0
- Adequate equipment:
 - for clamping the brake valve,
 - for actuating the pedal with degree 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 P28 (pressure in bar) and G1 to G9 (travel in degree) in document "Test values 2/2".

Reservoir pressure is 10 bar max.

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

! CAUTION

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

- 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).

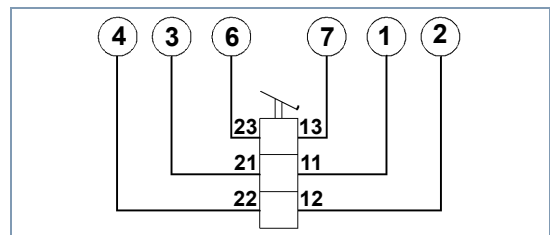


Fig. 3 Test Bench Ports

! CAUTION

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

- Close each one port 11 and 12.

i The marking of the adjusting screws 1 and 2 must be in position "bottom dead center" (see fig. 4).

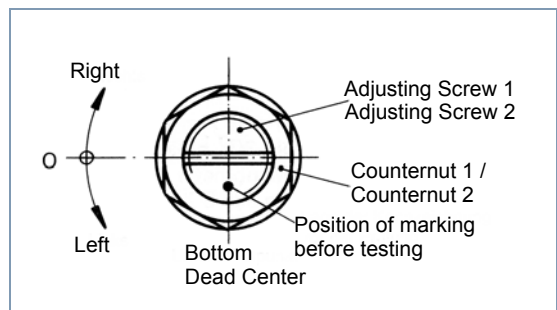


Fig. 4 Bottom Dead Center

- Screw in cap as far as the thread is no more visible.

- Adjust stop screw for the pedal without clearance.
- i** Here the tappet of valve I must not have made any movement (see fig. 5).
- Counter stop screw with M = 20 Nm.

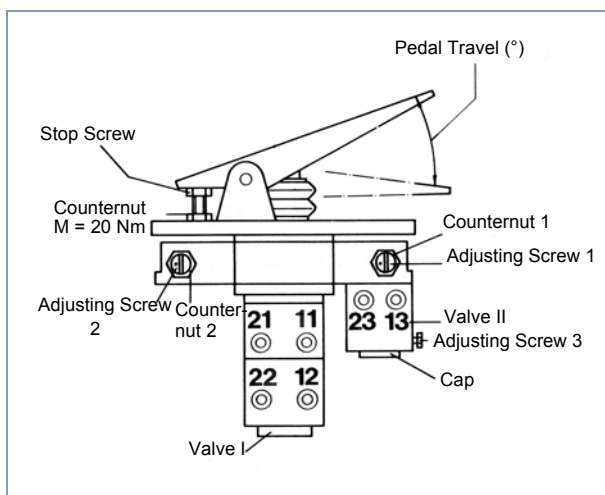


Fig. 5 Brake Valve 461 324 ... 0

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, 12 and 13 with P1.
- ⌚ Gauges 1, 2 and 7 must indicate 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 the 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 P1.
Gauge 6 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 pedal to 0°.
- ⌚ Gauges 3, 4 and 6 must indicate 0 bar.

4. Obtain maximum pressure

- Operate pedal G1 (stop within the device).
- i** Pressure must increase immediately.
- ⌚ Gauges 3 and 4 must indicate P1.
Gauge 6 must indicate P2.
- Re-adjust pedal to 0°.
- ⌚ Gauges 3, 4 and 6 must indicate 0 bar.

5. Graduability

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

6. Adjusting

6.1 Adjustment of valve II without clearance

- Turn adjusting screw 2 to right until resistance.
- i** Here the tappet of valve II must not have made any movement.
- Tighten counternut 2 with M = 45 Nm.
- Operate pedal several times.
- ⌚ Gauges 3, 4 and 6 must indicate immediate pressure increase resp. decrease.
- i** In accordance with the type of device, one circuit must have predominance.

6.2 Pressure pre-adjustment at port 23

- Adjust pedal to G2.
- Turn cap to the left until gauge 6 indicates P6.
- ⌚ Gauge 3 must indicate P3.
Gauge 4 must indicate P4.
- Turn cap to the right.
- ⌚ Gauge 6 must indicate P5.
- Tighten adjusting screw 3 with M = 0,4 Nm.

6.3 Pressure fine adjustment at port 23

- Turn adjusting screw 1 to the right until gauge 6 indicates max. P7.
- Turn adjusting screw 1 to the left until gauge 6 indicates max. P8.
- ⌚ Gauge 3 must indicate P9.
Gauge 4 must indicate P10.

- Tighten counternut 1 with $M = 45 \text{ Nm}$.
- Adjust pedal to 0° .

7. Check pressure increase

7.1 Check sudden pressure increase (Gauge 6)

- Adjust pedal to G3.
- i** Pressure must increase immediately.
- ⊗ Gauge 6 must indicate P11.
- ⊗ Gauges 3 and 4 must indicate 0 bar.

7.2 Check sudden pressure increase (Gauge 3)

- Adjust pedal to G4.
- i** Pressure must increase immediately.
- ⊗ Gauge 6 must indicate P12.
- ⊗ Gauge 3 must indicate P13.
- ⊗ Gauge 4 must indicate P14.

7.3 Distance until venting of P15, P16 and P17

- Adjust pedal to G5.
- i** Pressure must increase immediately.
- ⊗ Gauge 3 must indicate P15.
- ⊗ Gauge 4 must indicate P16.
- ⊗ Gauge 6 must indicate P17.

7.4 Distance until venting of P18, P19 and P20

- Adjust pedal to G6.
- i** Pressure must increase immediately.
- ⊗ Gauge 6 must indicate P18.
- ⊗ Gauge 3 must indicate P19.
- ⊗ Gauge 4 must indicate P20.

7.5 Distance until venting of P21, P22 and P23

- Adjust pedal to G7.
- i** Pressure must increase immediately.
- ⊗ Gauge 6 must indicate P21.
- ⊗ Gauge 3 must indicate P22.
- ⊗ Gauge 4 must indicate P23.

7.6 Distance until venting of P24, P25 and P26

- Adjust pedal to G8.
- i** Pressure must increase immediately.
- ⊗ Gauge 6 must indicate P24.
- ⊗ Gauge 3 must indicate P25.
- ⊗ Gauge 4 must indicate P26.

7.7 Distance until venting of P1/P2

- Adjust pedal to G1.
- i** Pressure must increase immediately.
- ⊗ Gauges 3 and 4 must indicate P1.
- ⊗ Gauge 6 must indicate P2.
- Re-adjust pedal to 0° .
- ⊗ Gauges 3, 4 and 6 must indicate 0 bar.

8. Failure of circuit 1

- Vent port 11 to 0 bar.
- ⊗ Gauge 1 must indicate 0 bar.
- Adjust pedal to G9.
- ⊗ Gauge 3 must indicate 0 bar.
- ⊗ Gauge 6 must indicate P28.
- ⊗ Gauge 4 must indicate P27.
- Re-adjust pedal to 0° .
- ⊗ Gauges 3, 4 and 6 must indicate 0 bar.
- Exhaust device to 0 bar.

9. Completion of test

- Vent port 12 to 0 bar.
- ⊗ Gauges 1, 2 and 7 must indicate 0 bar.



CAUTION

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

- Removing device from fixture.
- Cleaning device.