

Test instruction

Symbols and Signal Words



WARNING

Possible hazardous situation. To disregard this may lead to serious or fatal personal injuries.



CAUTION

Possible hazardous situation. To disregard this may lead to personal injuries.

- Handling
- List

i Note(s), explanation(s) and information which you must take into consideration.

i Carefully read through all the safety information before starting the testing.

Safety information



WARNING

Only qualified skilled personnel with specific system knowledge are authorized to perform the device testing at the test bench.

Never start testing until you have read and understood all the information required for the test.

Test the device on a calibrated test bench only.

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

While testing the device, always adhere to the contents of this test instruction.



CAUTION

Comply with the company and national accident prevention/health & safety regulations

Undo the screw plugs, hoses and equipment parts only when the respective lines have been vented.

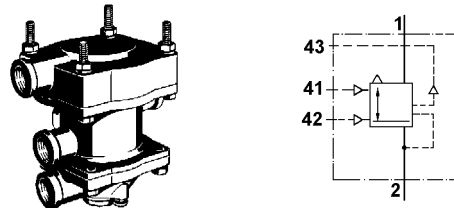


Fig. 1 Trailer Control Valve 973 002 ... 0 / Functional symbol

Test instruction for device 973 002 ... 0

000	019	126	406	430
004	020	127	407	450
010	022	400	409	462
011	115	401	420	
012	117	402	422	
013	124	403	423	

Equipment/tools required

- Test bench 435 197 000 0 or adequate testing equipment (see fig. 3)
- Clamping angle 899 709 035 2 (see adjacent fig.)
- Soapsuds and brush
- Philips screwdriver (min. PH2x120)



Additional documents required

- i** The documents are available on the WABCO homepage <http://www.wabco-auto.com> - simply enter the product or document number in INFORM.
- Test Bench 435 197 000 0 - Operating Instructions
- General Repair and Test Information
 - 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

Testing

WARNING

Do not install a repaired device in the vehicle unless it has passed the following tests.

1 External inspection

- Inspect the device for external visible damage.
- Visually inspect all the device's ports for blockages.

2 Preparations


Test bench

Before starting each test, ensure that the stopcocks are in their correct normal position (see table 1).

The output side of pressure regulator D must be unpressurised.

Shut-off cocks	A	B	C	F	L	V	2	3	4	6	7	11	12	21	22
open	x		x	x									x		x
closed		x				x	x	x	x	x	x		x		x

Table 1: Normal position of stopcocks on the test bench

 If you do not have test bench 435 197 000 0 you must test the device according to the following diagram (see fig. 3).

Never directly clamp the device in the vice. This could damage the device.

- Fix clamping angle to device.
- Clamp the clamping angle and the device in the vice.
- Connect the device to the test bench ports (see fig. 2) or according to the test diagram.

Test bench

Set pressure regulator D to 7 bar.

CAUTION

Ensure that the plug-in connections on the test bench and the device are securely inserted.

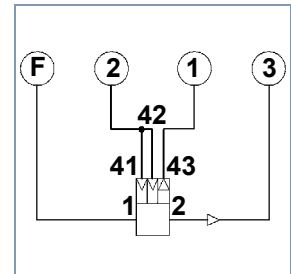


Fig. 2 Test bench connection diagram

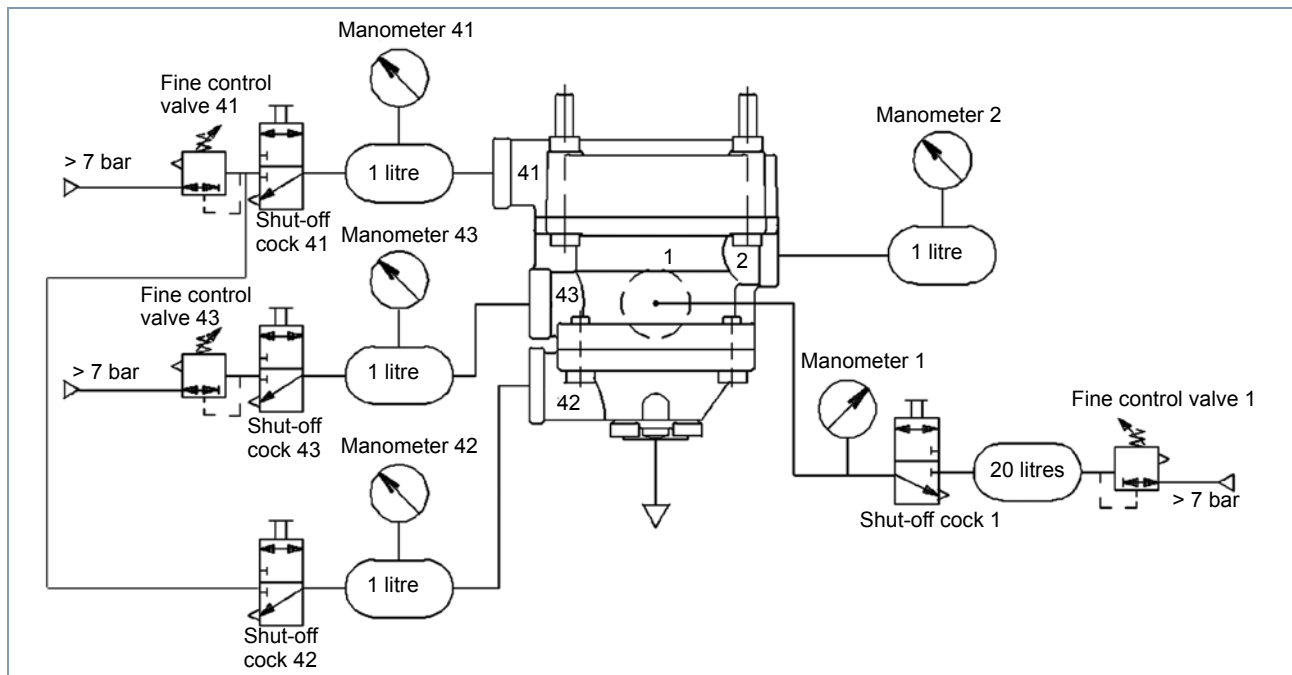


Fig. 3 Test diagram



Trailer Control Valve

with predominance / without predominance

973 002 (B)

i Perform the following test sequence in the specified order.
Default value V and test value P see tables 3 and 4.

i If test values do not fit, adjust the device.
The braking pressure is 8 bar max / 7 bar min.

Test step	Device ports					Note
	A1 bar	A41 bar	A42 bar	A43 bar	A2 bar	
3 Leak test						
Vent A1 and A43. Undo and twist off the hose connection at A42. Wet A42 and the device vent with soap suds. Reconnect the hose connection.	7	0	0	7	0	Permissible leakage: 8 cm ³ /min  WARNING Never install a leaking trailer control valve on the vehicle.
4 Functional test						
Depressurise and pressurise A43 several times.	7	0	0	7...0 0...7	- -	Manometer 43 (test bench: Manometer 1) must display an immediate rise or drop in pressure.
Vent A43.	7	0	0	V1	P1	
Check for leaks Vent A43 slowly. Wet A41 and A42 with soap suds.	7	0	0	0	P2	Permissible leakage: 8 cm ³ /min  WARNING Never install a leaking trailer control valve on the vehicle.
Vent A43.	7	0	0	V2	-	Start of the pressure drop at manometer 2 (test bench: manometer 3). Device must audibly vent.
Vent A43.	7	0	0	V3	0	Pressure at manometer 2 (test bench: manometer 3) must audibly drop to 0 bar.
Continue to vent A43.	7	0	0	7	0	

Test step	Device ports					Note
	A1 bar	A41 bar	A42 bar	A43 bar	A2 bar	
Pressurise and depressurise A41 several times.	7	0...7 7...0	0	7	0...7 7...0	Manometer 2 (test bench: Manometer 3) must display an immediate rise or drop in pressure. Device must audibly vent.
Vent A41.	7	V4	0	7	P3	
Increase pressure slowly.	7	V5	0	7	P4	Only on variants: 023, 020, 117, 420, 422 Adjust value P4 via adjusting screw, therefore remove exhaust. Only on variants: 001, 010, 012, 115, 117, 127 Measuring of the possible predominance.
Only on variants: 001, 010, 012, 115, 117, 127 Vent A41 slowly.	7	V6	0	7	P5	Adjust value P5 via adjusting screw, therefore remove exhaust (final adjustment).
5 Pressure stage checking						
Vent A41 slowly until manometer 2 (test bench: manometer 3) shows a change. At this moment stop pressure increase and check manometer 2 (test bench: manometer 3).	7	-	0	7	Pressure stages: max. 0.3 bar	
Increase pressure slowly.	7	V7	0	7	P6	
Vent A41.	7	V8	0	7	-	Start of the pressure drop at manometer 2 (test bench: manometer 3). Device must audibly vent.
	7	V9	0	7	P7	



Test step	Device ports					Note
	A1 bar	A41 bar	A42 bar	A43 bar	A2 bar	
Vent A41 slowly until manometer 2 (test bench: manometer 3) shows a change. At this moment stop pressure decrease and check manometer 2 (test bench: manometer 3).	7	-	0	7	Pressure stages: max. 0.3 bar	
Vent A42 slowly.	7	0	V10	7	P8	
Continue to vent A42.	7	0	7	7	P9	
6 Leak test						
Vent A41. Wet flanges and device vent with soap suds.	7	7	7	7	-	Permissible leakage: 8 cm ³ /min  WARNING Never install a leaking trailer control valve on the vehicle.
7 Vent device.						
Vent A1, A41, A42 and A43.  CAUTION Do not disconnect the hose connections until you have vented the device to 0 bar. Clean device and unclamp.	0	0	0	0	0	

Table 2: Test steps

Default and test values

973 002 ... 0 Variant	V1	P1	P2	V2	V3	V4	P3	V5	P4		V6
000	=> 012										
004	=> 115										
010	≥5.6	>0	≥5.8	0...0.5	6.1...6.7	>0...≤0.3	>0	2...3	A41+1		2...3
011	≥5.6	>0	6.2...7	0...0.5	6.1...6.7	>0...≤0.3	>0	2...3	A41+1		2...3
012	≥5.6	>0	6.2...7	0...0.5	6.1...6.7	>0...≤0.3	>0	2...3	A41+1		2...3
013	≥5.6	>0	6.2...7	0...0.5	6.1...6.7	>0...≤0.3	>0	2...3	A41+1		2...3
019	=> 402										
020	≥5.6	>0	≥5.8	0...0.5	6.1...6.7	>0...≤0.3	>0	2	2.3±0.1		
022	≥5.6	>0	≥5.8	0...0.5	6.1...6.7	>0...≤0.3	>0	2	2.2±0.1		
115	≥5.6	>0	6.2...7	0...0.5	6.1...6.7	>0...≤0.3	>0	2...3	A41 +1		2...3
117	≥5.6	>0	6.2...7	0...0.5	6.1...6.7	>0...≤0.3	>0	2...3	A41+min.0.85		2...3
124	=> 115										
126	=> 012										
127	=> 115										
400	=> 012										
401	=> 012										
402	≥5.6	>0	6.2...7	0...0.5	6.1...6.7	>0...≤0.3	>0	2...3	A41	0 -0.2	
403	=> 001										
406	=> 010										
407	=> 402										
409	=> 001										
420	≥5.6	>0	≥5.8	0...0.5	6.1...6.7	0...0.3	>0	2	2.3±0.05		
422	≥5.6	>0	6.2...7	0...0.5	6.1...6.7	>0...≤0.3	>0	2...3	A41+0.2	0 -0.2	
423	=> 115										
430	=> 402										
450	≥5.6	>0	6.2...7	0...0.5	6.1...6.7	>0...≤0.3	>0	2...3	A41	0 -0.2	
462	=> 402										

Table 3: Default and test values (V = Default value, P = Test value)

Trailer Control Valve

with predominance / without predominance

973 002 (B)

Default and test values

973 002 ... 0 Variant	P5	V7	P6	V8	V9	P7	V10	P8	P9
000	=> 012								
004	=> 115								
010	A41+0.5±0.1	6.3...6.6	7	≥5.8	3...2	A41+1±0.2	0...1.4	>0	≥6.4
011	A41+0.2±0.1	6.5...6.8	7	≥6.2	3...2	A41+0.7 ₀ -0.4	0...1.4	>0	≥6.4
012	A41+0.6±0.1	6.2...6.6	7	≥5.8	3...2	A41+1±0.2	0...1.4	>0	≥6.4
013									
019	=> 402								
020		7	6.2...6.6	7...6.6	3	3.5±0.2	0...1.4	>0	5.8...7
022		7	≥5.8	7...6.1	3	3.5±0.2	0...1.4	>0	5.8...7
115	A41+0.3±0.1	6.4...6.8	7	≥6	3...2	A41+0.7 ₀ -0.4	0...1.4	>0	≥6.4
117	A41 ₀ ^{+0.15}	7	6.8...7	≥6.2	3...2	A41±0.5±0.2	0...1.2	>0	6.4...7
124	=> 115								
126	=> 012								
127	=> 115								
400	=> 012								
401									
402		7	≥6.7	≥6.2	3...2	A41 ₀ -0.2	0...1.4	>0	≥6.4
403	=> 001								
406	=> 010								
407	=> 402								
409	=> 001								
420		7	6.2...6.6	7...6.6	2	3.2±0.15	0...1.4	>0	5.8...7
422		6.6...7	7	≥6.2	3...2	A41+0.3±0.2	0...1.4	>0	6.4...7
423	=> 115								
430	=> 402								
450		7	6.8...7	≥6.2	3...2	A41 ₀ ^{+0.2}	0...1.2	>0	6.4...7
462	=> 402								

Table 4: Default and test values (V = Default value, P = Test value)