

Test Instructions for Compressors

Symbols used

CAUTION



Potential hazard situations that can cause minor or moderate to severe injury, or material loss, if the safety instruction is not observed.

– Handling

• List



Important instructions, information, or tips that you should always observe.

Safety information



Carefully read through all the safety information before starting the tests.

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

Always follow the specifications and instructions of the vehicle manufacturer.

Always comply with the company's accident prevention regulations as well as national regulations.

It is imperative that you follow these test instructions while testing the device.

Wear suitable protective clothing as the situation requires.

Secure the vehicle against rolling.

Attach a clearly visible note to the steering wheel indicating that repair work is being performed on vehicle.

Only trained and qualified personnel may perform the compressor test.

Tests that need to be carried out with the engine running must only be performed in spaces equipped with an exhaust extraction system, or outdoors. Inhaling carbon monoxide can cause serious damage to health and even death.

Additional documents required

The documents are available on the WABCO website <http://www.wabco-auto.com> - simply enter the document title or document number in INFORM.

- Installation and Maintenance of Compressors 41. and 91.
- General Repair and Test Information (815 010 109 3 - English edition)

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Test Instructions for Compressors

1 Tests for diagnostics

1.1 Oil consumption too high

If oil consumption is indicated as too high, perform the following test steps:

- Check whether air filter and intake line are clean.
- Check the intake line for damage.

CAUTION



Risk of injury

Keep your hands and hair away from moving parts.

Risk of injury

Do not wear a tie, wide clothing, open hair, bracelets or watches, etc when working on the vehicle, especially if the engine is running.

Burn hazard

Do not touch any vehicle components that are warm.

Perform an oil test using the paper method:

Required materials: strong paper on a stable base

- Leave the compressor running for approx. 10 minutes to warm up.

CAUTION

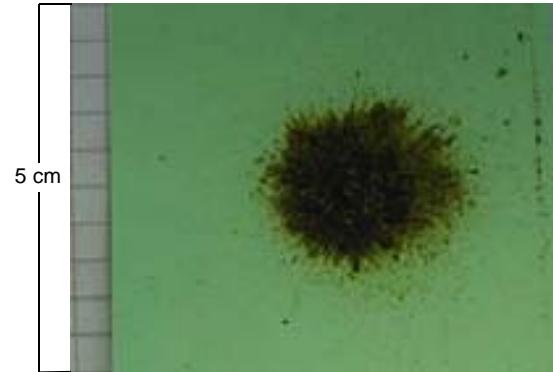
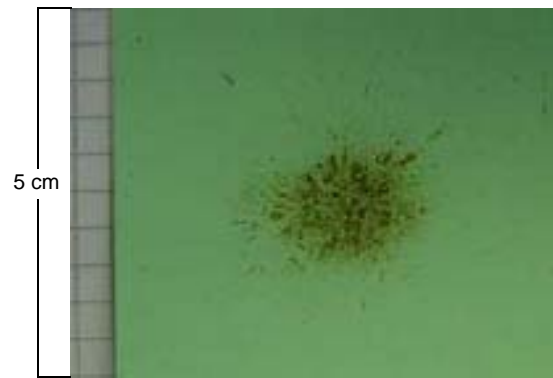


Burn Hazard

Wear protective gloves when dismantling the pressure line.

- Dismantle the pressure line (port 2) of the compressor.
- Increase static rpm of motor.
- Hold the paper in front of the open compressor port 2 for 45 seconds at a distance of approx. 3 cm.
- Compare the pattern with the following photos.

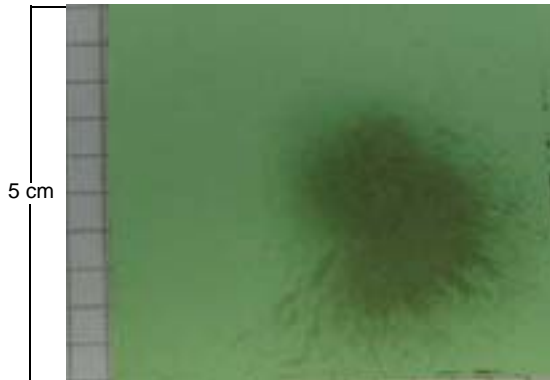
Oil consumption normal:



Dark spots on the paper alone do not indicate increased oil consumption of the compressor because carbon may have collected and settle on the paper. It is important whether the paper is dry or damp.

Damp oil deposits indicate increased oil consumption.

Oil consumption too high:



- ! Dampness is indicated by the radial pattern.
- Replacing the cylinder head alone is not sufficient to stop increased oil consumption.
- Replace the compressor to avoid damaging other parts of the braking system.

1.2 Pressure in the cooling system

Testing the tightness of the compressor cylinder head:

- Seal a coolant port (e.g. port 9.1).
- Connect a compressed air adapter to the second coolant port.
- Apply max. 12 bar to the coolant area.
- Check the suction port for air leaks (any bubble formation, leakage indicating spray).
- Check the discharge air port for air leaks (any bubble formation, leakage indicating spray).
- Note any leaks towards the outside.

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1.3 Long filling times / Cut-off pressure is not reached

If the vehicle takes a long time to fill the braking system, this may be due to one of the following causes, which should be checked in this order:

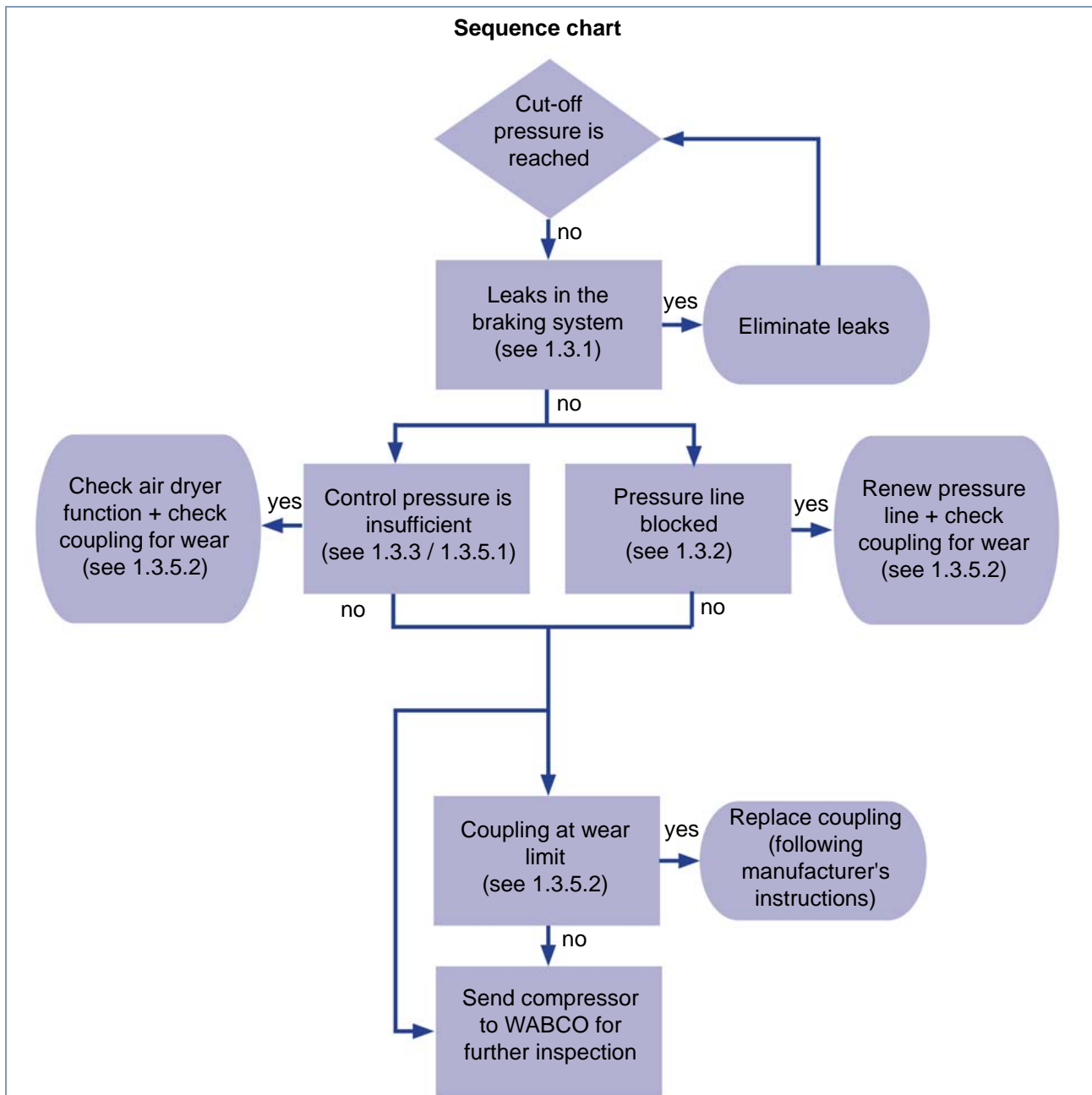
- Leaks in the braking system
- Blocked pressure line
- Incorrect cut-off pressure or PR control not functioning.
- Compressor has an insufficient flow rate.
- Insufficient force transmission of the coupling

1.3.1 Leaks in the braking system

- Pay attention to noise levels.
- Observe pressure losses while engine is stopped.
- Soap down suspected areas of the braking system to ensure that there are no significant leaks.

Reading out the vehicle data memory to check the duty cycle of the compressor:

- If the duty cycles are excessively high (information for vehicle, e.g. truck >50%, note vehicle manufacturer's specifications), determine the cause and remedy it.



Test Instructions for Compressors

1.3.2 Blocked or leaking pressure line

Required test equipment

T connector for connecting port 2 of the compressor with a pressure gauge

- Connect the pressure gauge to the air dryer inlet 1. For this purpose you need to install a T connector at the end of the pressure line upstream of the unloader valve inlet, unless a different connection is available.
- Make sure that the compressor is in the delivery phase when starting the motor (actuate service brake a number of times if necessary).
- Check pressure line for leaks by covering the pressure line, which must be cold, with soap. When starting the motor, check for bubbles.
- At the same time, measure the pressure at the compressor's pressure port and at the pressure inlet of the unloader valve / air dryer.

! If both pressures increase to the same level, the pressure line is OK.

If the pressure at the compressor is significantly higher than the pressure at the unloader valve, the pressure line is blocked and must be replaced (maximum value must be set according to vehicle type).

A blocked pressure line can cause severe consequential damage (compressor failure).

If a coupling compressor is installed, the wear of the coupling must be checked (see item 1.2.5.2) and replaced as required.

1.3.3 Incorrect cut-off pressure or PR control not functioning

- Connect a pressure gauge to the air dryer outlet 21 or the wet tank.
- Check the unloader valve function (reaching cut-off pressure and then venting the delivered air).

! If the compressor has a PR system, the unloader valve control signal must be checked.

To check the PR signal, the following tests must be carried out:

- Measure the control pressure at the compressor inlet (port 4).

! As soon as the cut-off pressure is reached, the control pressure must jump to > 7 bar. When switching to "Delivery" position / Delivery phase, the control line must vent to atmospheric pressure immediately.

1.3.3.1 Test of the separate functions of compressor and control signal by disconnecting the control line

- Vent the line from the compressor to atmospheric pressure.
- Seal the line from the air dryer.

The system must deliver until the cut-off pressure is reached (sudden discharge of air at the air dryer).

1.3.4 Compressor has an insufficient flow rate

- If the compressor is driven by a V-belt, check the corresponding manufacturer's specifications regarding belt tension.

! To check the flow rate, the filling time of the vehicle's braking system must be measured. Here the specifications of the vehicle manufacturer must be observed.

If faults were detected during the previous tests, the compressor must be repaired or replaced. In addition to the compressor, the pressure line should always be replaced as well to avoid another failure after a short period of operation.

Test Instructions for Compressors

1.3.5 Insufficient force transmission of the coupling

1.3.5.1 Test of coupling control signal

- Connect a pressure gauge to the air dryer outlet 21 or the wet tank.
- Check the unloader valve function (reaching cut-off pressure and then venting the delivered air).

! If the compressor has a coupling, the coupling control valve must be checked.

To check the unloader valve signal, the following tests must be carried out:

- Measure the control pressure at the compressor inlet (port 4).

! As soon as the cut-off pressure is reached, the control pressure must jump to > 7 bar. When switching to "Delivery" position / Delivery phase, the control line must vent to atmospheric pressure immediately.

Test of the separate functions of compressor and control signal by disconnecting the control line:

- Vent the line from the compressor to atmospheric pressure.
- Seal the line from the air dryer.

The system must deliver until the cut-off pressure is reached (sudden discharge of air at the air dryer).

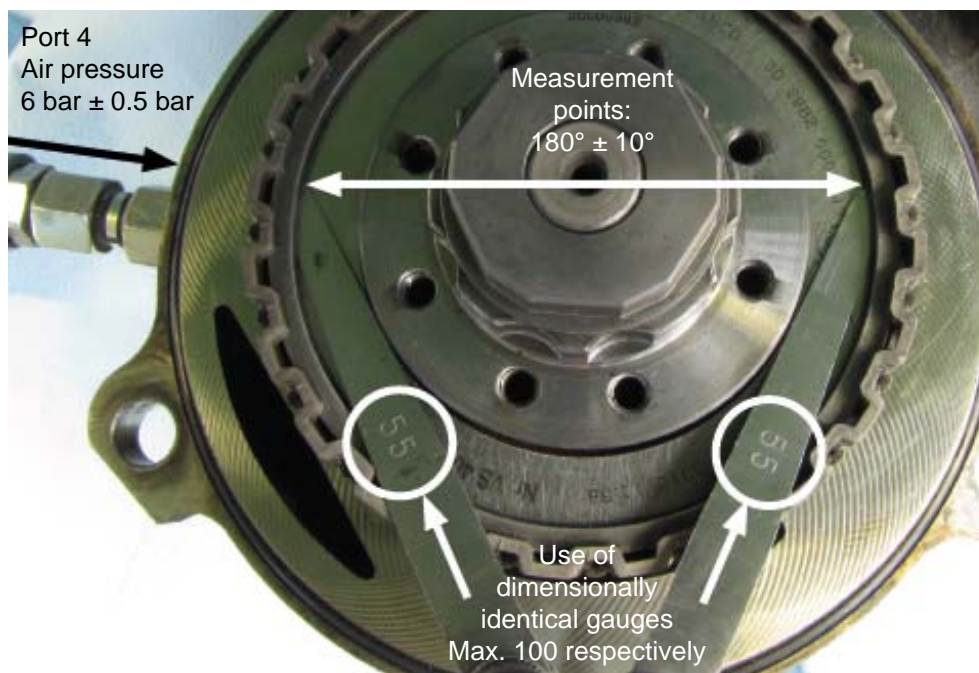
1.3.5.2 Test of the coupling

Checking the wear value:

The coupling needs to be replaced at a wear value of ≥ 1.0 mm.

The wear limit (failure of the coupling) must be expected at a wear value of ≥ 1.2 mm.

- Note any audible leaks during this procedure. Replace the actuating unit as required.



Test Instructions for Compressors


2 Tests after replacing the compressor

The following points should be checked:

- Tightness
- Filling times
- Cooling system (for water-cooled compressors)

2.1 Testing for leaks


- Cover the compressor and the connections of the renewed pressure line with soap sud.

 No bubbles must form when the motor is started or the system is filled.

- After the cut-off pressure has been reached, check the PR control line for tightness (soap sud).

2.2 Test of the filling times

- Measure the time required to reach the cut-off pressure after starting the motor.
- Compare the measured time with the time specified by the vehicle manufacturer.

 If the specified time is not achieved, you must continue checking for leaks in the system.

2.3 Test of cooling circuit

- In the case of water-cooled compressors, check the cooling circuit for leaks or loss of cooling water.