

Completion of new cylinder heads (OHV engines)

Checking the components

Preparation



De-wax and wash new cylinder heads and check for external damage. Clean oil bores and valve guides with a brush.

Note:
Carefully clean the mounting parts to be re-used and replace any defective used parts.

Checking used valves



The valve seats on the valves must not be staved in. If they are: Replace valves or rework valve seats using a valve grinding machine.



The valve stem faces must also not be damaged. Therefore rework damaged valve stem face surfaces or replace valves.



The clamping areas and the insertion grooves for the valve cotters must be undamaged and free from burrs. The form fit to the valve cotters must also work perfectly. For safety reasons, the valve cotters must always be replaced.

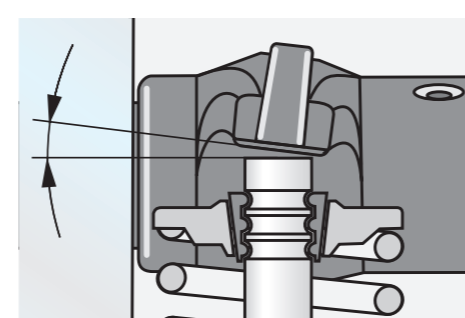


Concentricity of the valve seat surface must be checked using prism and dial gauge. Bent valves must always be replaced.



The valve shafts must not exhibit any visible wear. The diameter of the valve stem and length of the valves must correspond to the manufacturer's specifications (repair shop manual).

Checking the rocker arms



Used rocker arms must not be bent or torn. Oil bores for lubricating the rocker arm and rocker arm shaft must be unrestricted.



The valve actuating surfaces and the ball sockets must not exhibit any damage, such as seizure areas or impressions. To ensure the correct axial clearance, the diameter of the rocker arm axle and its bores must correspond to the set-point values of the engine manufacturer (repair shop manual).

Checking the valve guide clearance



The diameter dimensions of the valve stem and valve guide are deducted from each other and compared with the clearance specifications of the manufacturer. If the clearance is too great, the valve may be worn and must be replaced. If the clearance is too small, then the valve guide must be reworked using a reamer.

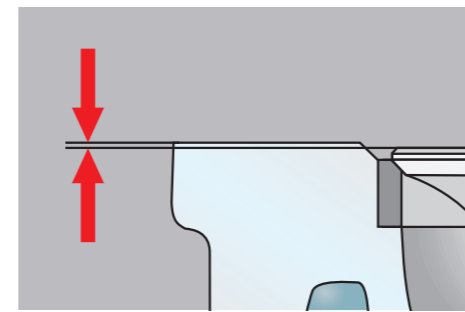
Guide values for the valve guide clearance

Valve stem Ø	Intake valves	Exhaust valves
6 – 7 mm	10 to 40 µm	25 to 55 µm
8 – 9 mm	20 to 50 µm	35 to 65 µm
10 – 12 mm	40 to 70 µm	55 to 85 µm

Measuring the valve recess



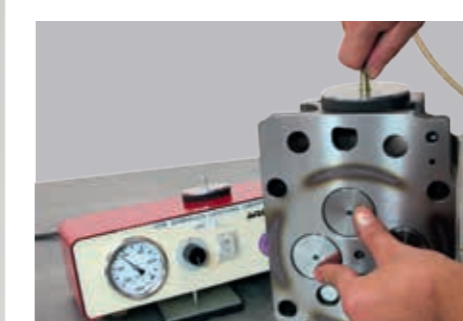
The valve recess dimension must correspond to the manufacturer's specifications (repair shop manual). If the valve recess is too great, the valve must be replaced. If the valve recess is too small, check whether the correct valve is being used. Replace the valve if required, or rework the valve seat insert until the prescribed recess dimension is achieved.



Attention:
An excessively large valve recess leads to diminished compression. If the valve recess is too small, the valve may collide with the piston during operation.

Valve tightness test

Vacuum test



The required check for valve tightness can be performed by means of a vacuum test from the duct side. Alternatively, the combustion chamber bowl can be filled with a small amount of fluid (petrol, petroleum).

Grinding in valves



If there is a leak, first check the valves for radial eccentricities and damage before reworking the valve seat inserts or grinding in the valves.

Note:
New valves may already exhibit radial eccentricities due to damage in transit. It is therefore also recommended to check new valves for concentricity.

Mounting the components

Mounting the valve stem seal



Oil the valve stems before final mounting and insert the valves into the valve guides. Fit the valve spring seats or the valve rotators (if prescribed).



Slide the valve stem seals over the valve stems using an oiled protective bushing.



Push the valve stem seals onto the guides using a suitable fitting tool. Valve stem seals with a plastic supporting body can be pressed on manually. Valve stem seals with metal supports must be carefully and lightly tapped into place using a plastic hammer. The seal is in place when you hear a different (deeper) tapping sound.

Note:
The use of protective bushings is recommended to ensure that the sealing lips are not damaged on the sharp edges of the valve cotter grooves.

Mounting the valve springs



Check the valve springs for length and rectangularity. Insert valve springs with valve spring retainers and press down valve cotters with a suitable tool or equipment for mounting.

For further details and information on this subject, see our technical video "Completion of cylinder heads for utility vehicles" on our YouTube channel: [youtube.com/motorservicegroup](https://www.youtube.com/motorservicegroup).

Or ask your local Motorservice partner. We have also provided a lot more information for you at www.ms-motorservice.com and on our Technipedia at www.technipedia.info.

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