

Issue No.: 1/2010 – Assembling and Disassembling Valve Guides

The valve guides are very important components in the cylinder head. As the name suggests they guide and support the valves, thus contributing to a long engine life. Like the valves, valve guides are subject to natural wear and tear. Therefore both components should always be replaced together.

PLEASE CONSIDER THE FOLLOWING TO AVOID UNPLEASANT SURPRISES:

The valve guides should be disassembled using a press (Figure 1). Subsequently the cylinder head bores have to be inspected in terms of damage. It is essential to clean the cylinder head after pressing out, to avoid that foreign particles are between the valve guide and the cylinder head when the valve guides are assembled.



Figure 1: Pressing out of the valve guide

THE VALVE GUIDES SHOULD BE ASSEMBLED AS FOLLOWS:

A sufficient overlap between cylinder head bore and outer dimension of the valve guide is important. The valve guides are inserted into the previously cleaned

cylinder head bores. This can either be done using a press (Figure 2) or using a method without force, thus limiting the risk of material damage. In the latter case, the cylinder head is heated and the valve guides are simultaneously cooled, e.g. using liquid nitrogen.



Figure 2: Pressing in of the valve guide

Keep in mind during assembly that the valve guides must not be inserted too far into the cylinder head, otherwise there is the danger of valves getting jammed in the valve guides. Then the valves would not close properly. Possible secondary damage would be: burning through of the valve disks, a stem seizure, or a collision of the piston with the valve.

INDISPENSABLE: REAMING THE VALVES

Please note: After the successful assembly of the valve guides they must be machined to the finished dimension using a reamer.

Why? Even if the valve guides have been assembled correctly by pressing in or by application of the temperature method, distortions or micro burrs, caused for example by a distorted valve guide drilling, may occur within the valve guides. These geometrical deviations have an oil-scrapping effect. If the engine is nevertheless operated there will be a lack of lubrication. The imminent consequences: valve stem seizure or valves jammed in the valve guide.