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A good valve job is very important in an air-cooled engine, as a great deal of the heat must be dissipated through the valve seats. This is especially true of the exhaust valve, which is made of special steel to withstand the elevated temperature under which the valve must operate.

If valve seat and valve refacing equipment is available, although not always necessary, it is desirable to use a seat cutter and valve refacer at each engine overhaul. Both valve and valve seat should be refaced, or neither refaced; never reface one without the other. Reface valve to 45° and finish seat to 46° . This difference in angle between valve and seat permits lapping the valve to a single ring contact. This contact ring must be complete. Valve seat width is shown in Fig 9. When the valve and seat are refaced, the valve should then be ground in with a very fine compound. If neither has been refaced, a medium grinding compound should be used first to remove the hard carbon particles and then the final grinding accomplished with a very fine grinding compound. It is also very important that only a slight pressure be used on the valve while grinding.

Test valve for concentricity with seat and for tight seating. Valves can be tested by lighting coating the valve face with prussion blue and turning the valve against its seat. This indicates whether the seat is concentric with the valve guide, but does not prove that the valve face is concentric with the valve stem, or that the valve is seating all around. After making this test, wash all blue from the surface, lightly coat the valve seat with blue and repeat the test to see whether a full mark is obtained on the valve. Both tests are necessary to prove that a proper seat is being obtained.

Valve guides and valve seats are shrunk in place and replacement is not recommended with the facilities available in the average home workshop. If valve guides and valve seats are worn to such an extent that efficient engine operation is no longer possible and replacement of these parts is necessary, the cylinder head should be taken to an automotive machine shop that has the proper equipment for a complete assembly overhaul.

VALVE SPRINGS After the valve springs have been thoroughly cleaned they should be carefully examined for cracks and straightness. If springs are not square an uneven side thrust will be exerted on the valve stem and guide. The free length of all springs should be about the same. If a valve spring testing fixture is available, when the springs are compressed to lengths given in table below the indicator should read as follows:-

	<u>Old Model</u>	<u>New Model</u>
Compressed length	1.3"	1.22"
Load	95.5 lbs + 6.6 lbs	126 lbs + 9 lbs

If a spring fixture is not available, after the valve has been installed in the cylinder head it can be checked for loading. The valve spring when assembled, should support a weight as specified in the above table, when valve is on its seat.

Check valve keys for wear, also spring caps for wear.

DRILLING AND TAPING FOR EXTRA SPARK PLUG IN VW CYLINDER HEAD Because the spark plug must be installed on two different angles it is advisable to build a drill jig to hold the cylinder head while this work is being done (as per Fig. 10).

After the jig has been completed it is recommended that you borrow a discarded cylinder head from your local VW dealer's scrap box to practice on.