D. Checking and Replacing Valve Guides

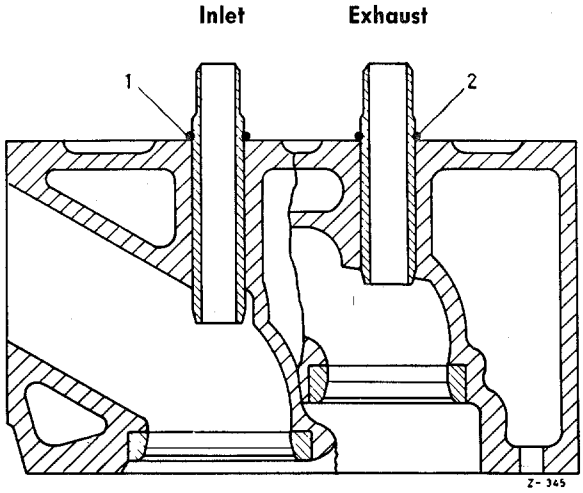

Fig. 01 — 5/6

1 Snap ring 14 DIN 9045 for inlet
2 Snap ring 14 DIN 9045 for exhaust

1. Clean the bores of the valve guides with Cylinder Brush 000 583 04 38 and gasoline or paraffin.

   Hard oil carbon deposits in the guides should be removed with a honing tool. Paraffin should be used for the lubrication.

   The honing tool consists of the following parts:

Hand Honing Tool with Nut and Setting Wrench	000 589 01 67
Adapter with Collet	000 589 03 31
Honing Shaft for Inlet	000 589 04 67
Honing Shaft for Exhaust	000 589 05 67

2. Use Testing Plug Gages 636 589 00 21 and 187 589 01 21 to measure the bores for the inlet and for the exhaust respectively.

   The gage should just drop to the bottom of the bore on the "go" side, and on the "not-go" side it should just bind on entering. If the "not-go" section of the Testing Plug Gage can be inserted, the guide must be replaced.

Note: Only testing plug gages in new condition must be used for measuring the bores. Attention is here drawn to the fact that **the gages must be examined from time to time to make sure that their accuracy has not been impaired by use.**

3. When replacing a valve guide, knock out the old valve guide with Drift 136 589 00 39.

4. Then check the base bore in the cylinder head, using an internal micrometer. High spots can be smoothed off with a reamer or broach. If necessary, the base bore can be remachined but this must be done at an exact right-angle to the cylinder head separating surface.

5. The new valve guides must be selected so as to give a force-fit oversize of 0.007 mm. If a valve guide of the required force-fit allowance dimension is not available, an oversize guide must be re-ground or turned down to the required dimension.

6. Rub a little talc into the bores in the cylinder head and then place the valve guide on the bore (the valve guide must just bind at the entrance to the bore) and press into position with Forcing Sleeve 187 589 10 39. The guide must either be **pre-cooled** before being installed or alternatively, the cylinder head must be heated to approx. 60° C.

   The valve guide can be pre-cooled by means of liquid air or carbon dioxide snow.

Note: The valve guides are fitted with a radial groove in which there is a snap ring which serves to prevent axial displacement of the valve guide in the bore (see Fig. 01 — 5/6). The valve guides should therefore be pressed into the cylinder head only as far as the point where the snap ring lies against the cylinder head. If the valve guides are pressed in too far, the snap ring will jump out.

7. Check that the valve guides are firmly held in the cylinder head. Use a suitable plastic drift and by means of light hammer taps, attempt to drive the guide out again. If the guide remains firmly held, the correct force-fit has been obtained. But if the guide can be tapped back out of the bore, a guide

with a greater external diameter must be installed.

8. After pressing the valve guides into position, the bores should be checked with the testing plug gages. Any narrow parts should be carefully honed up to the correct dimension, using the honing tool for this purpose (see Paras. 1 and 2). It is, however, better to replace the valve guide once more.

Dimensions of Valve Guides and Bores in Cylinder Head

Measurements in mm

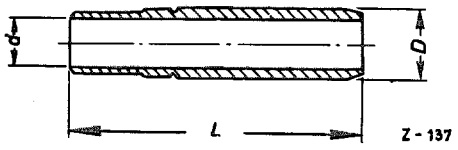

Fig. 01 — 5/7

Overhaul stage	Color code	Valve guide					Bore in cylinder head
		External diameter D	Internal diameter d		Length L		
			Inlet	Exhaust	Inlet	Exhaust	
Standard size	plain	14.013 / 14.007	9.000 / 9.015	10.000 / 10.015	67	58	14.000 / 14.006
	red	14.019 / 14.013					14.006 / 14.012
	white	14.025 / 14.019					14.012 / 14.018
	yellow	14.031 / 14.025					14.018 / 14.024
	blue	14.037 / 14.031					14.024 / 14.030
	brown	14.043 / 14.037					14.030 / 14.036
1st Overhaul stage	red	14.225 / 14.207					14.200 / 14.218
	white	14.425 / 14.407					14.400 / 14.418