

## Compression Ratio and Capacity of Compression Chamber

Model	180 a	180 b	220 a 219 <sup>1)</sup> 220 S <sup>1)</sup>	219 <sup>2)</sup> 220 S <sup>2)</sup>	220 SE	220 a <sup>3)</sup> 219 <sup>3)</sup> 220 S <sup>3)</sup>	190 SL <sup>4)</sup>	190 SL <sup>5)</sup>
Com- maximum pression standard ratio minimum	7.0:1	7.25:1	7.8	9.0	8.8	7.1	8.8	9.2
	6.8:1	7.0:1	7.6	8.7	8.7	6.8	8.5	8.8
	6.6:1	6.8:1	7.35	8.4	8.4	6.5	8.25	8.45
Total compression cham- ber capacity with cylinder head fitted in cm³	78.5—84.5	76—82	53.5—57.5	45.5—49.5	46.9—49.5	61.0—65.0	60.3—66.3	57.8—63.8
Compression chamber capacity in cylinder head with valves and spark plugs fitted in cc	70.3—71.3	68.5—69.5	44.3—45.3	36.4—37.4	36.4—37.4	51.2—52.2	51.7—53.7	49.3—51.3
Height of compression chamber in cylinder head	18 ± 0.3	18±0.3	18±0.3	18±0.3	18±0.3	18±0.3	18 ± 0.3	18 ± 0.3

<sup>1)</sup> On Model 219 up to Engine End No. 75 04347, on Model 220 S up to Engine End No. 75 09083.

<sup>2)</sup> On Model 219 with standard clutch as from Engine End No. N 75 04348, with hydraulic automatic clutch as from Engine End No. Z 75 00002.

On Model 220 S with standard clutch as from Engine End No. N 75 09084, with hydraulic automatic clutch as from Engine End No. Z 75 00008.

<sup>3)</sup> Engines with lower compression as an optional extra, on Models 220 a and 219 according to SA 10037, on Model 220 S according to SA 10187.

<sup>4)</sup> Up to Engine End No. 65 03803.

<sup>5)</sup> As from Engine End No. 65 03804.

## D. Checking and Replacing Valve Guides

For Models 180 a, 180 b, 190 SL, 220 a, 219, 220 S, and 220 SE this procedure is the same as described for Model 190.

On the first cars of Models 190 SL, 219, and 220 S shouldered valve guides were installed, which were later replaced by valve guides with a snap ring (to prevent axial displacement) of the type used on all cars of Models 180 a, 180 b, and 220 SE (Figs. 01-5/1 and 01-5/2). All cars of Model 220 a have shouldered valve guides as standard parts.

When repairs are carried out, the shouldered valve guides can without modification be replaced by valve guides with a snap ring.

On Model 220 SE the exhaust valve sealing system is the same as on the other models, but the inlet valve is sealed by a silicone sealing ring (see Fig. 01-4/25). For this reason, the top of the inlet valve guide has been redesigned (Fig. 01-5/3).

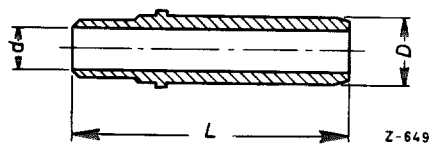


Fig. 01-5/1  
1<sup>st</sup> Version with  
shoulder

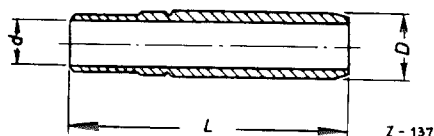


Fig. 01-5/2  
2<sup>nd</sup> Version with  
snap ring

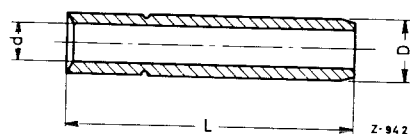


Fig. 01-5/3  
Inlet valve guide  
Model 220 SE

## Dimensions of Valve Guides and Bores in Cylinder Head

Model 180 a, 180 b, 190, 190 b, 190 SL, 220 a, 219, 220 S and 220 SE

Part-No.	Overhaul stage	Color code	External diameter D	Internal diameter d		Length L		Bore in cylinder head	Force-fit oversize in cylinder head
				In-let	Ex-haust	In-let	Exhaust		
Inlet 121 050 00 24 180 050 02 24 <sup>1)</sup> Exhaust 121 050 16 24 <sup>3)</sup>	Standard size	—	$\frac{14.013}{14.007}$					$\frac{14.000}{14.006}$	+ 0.007
		red	$\frac{14.019}{14.013}$					$\frac{14.006}{14.012}$	
		white	$\frac{14.025}{14.019}$					$\frac{14.012}{14.018}$	
Inlet 121 050 02 24 180 050 03 24 <sup>1)</sup> Exhaust 121 050 22 24 <sup>3)</sup>	1 <sup>st</sup> Overhaul stage	red	$\frac{14.225}{14.207}$	$\frac{9.000}{9.015}$	$\frac{10.000}{10.015}$	67 <sup>2)</sup>	57	$\frac{14.200}{14.218}$	
Inlet 121 050 03 24 180 050 04 24 <sup>1)</sup> Exhaust	2 <sup>nd</sup> Overhaul stage	white	$\frac{14.425}{14.407}$					$\frac{14.400}{14.418}$	

Note: The part numbers refer to valve guides with a snap ring.

<sup>1)</sup> Inlet valve guide for Model 220 SE

<sup>2)</sup> Length of inlet valve guide for Model 220 SE = 65.5 mm.

<sup>3)</sup> The previous Exhaust Valve Guides 121 050 01 24 (standard size), 121 050 04 24 (1<sup>st</sup> overhaul stage), and 121 050 05 24 (2<sup>nd</sup> overhaul stage) with a length L = 58 mm can be used up.

## Thrust Collars for Valve Springs

When installing the thrust collars, please note that in the case of shouldered valve guides thrust collars with a dimension  $a = 2.2 + 0.2$  mm are installed, and in the case of valve guides with a snap ring, thrust collars with a dimension  $a = 1.1 + 0.2$  mm (Fig. 01-5/4).

Under special circumstances thrust collars with the dimension  $a = 2.2 + 0.2$  mm can be used for valve guides with a snap ring, **but on no account should thrust collars with the dimension  $a = 1.1 + 0.2$  mm be used for shouldered valve guides.**

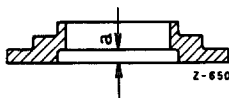


Fig. 01-5/4

Dimension  $a = 2.2 + 0.2$  mm for shouldered valve guides  
Dimension  $a = 1.1 + 0.2$  mm for valve guides with a snap ring

In the case of inlet valve guides for Model 220 SE (injection engine) with sealing ring and sealing ring retainer, the thrust collars have been replaced by a plain washer (see Fig. 01-4/25).