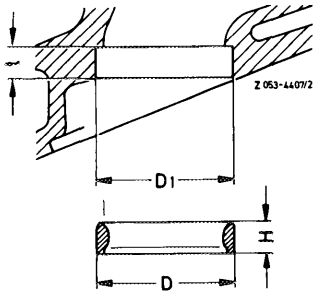
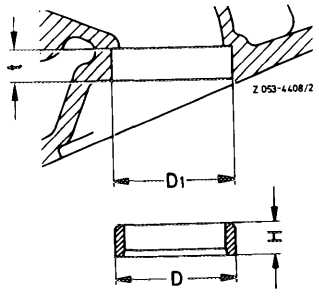
Engine		116.960 116.961	116.960 (AUS) (J) (USA) 116.961 (AUS) (J) (S) (USA)	116.962 116.963	116.964 116.965 117.960 117.961	117.962 117.963 117.964 117.965	117.967 117.968
Standard dimen. D 1	Intake	46.000–46.016	41.000–41.016		46.000–46.016		47.400–47.416
	Exhaust		40.000–40.016		42.000–42.016		–
Standard dimen. D	Intake	46.090–46.100	41.090–41.100		46.090–46.100		47.490–47.500
	Exhaust		40.090–40.100		42.090–42.100		–
Repair stage intake	D1 max. to	47.016	41.016		47.016		48.016
	D roughing dimension	47.300	41.300		47.300		48.700
Repair stage exhaust	D1 max. to		40.016		42.016		–
	D roughing dimension		40.300		42.300		–
t		10.300–10.800					
H		10.390–10.500					
Overlap of valve seat rings in cylinder head		0.074–0.100					



Intake



Exhaust

Special tool

Plug gauge 9 mm dia.		117 589 03 23 00

Conventional tools

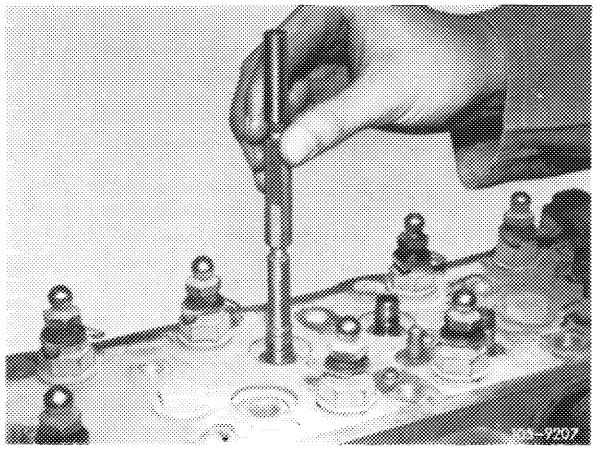
Cylinder head clamping device	e.g. Rothenberger, D–6233 Kelkheim
Ring seat turning tool	e.g. Hunger, D–8000 München Size 2, order No. 220.03.110

Valve seat turning tool	e.g. Hunger, D–8000 München Type VDSNL 1/45/30, order No. 236.03.308
Test set for valve seats	e.g. Hunger, D–8000 München Order No. 216.93.300
Internal measuring instrument (measuring range 25–60 mm)	e.g. Mahr, D–7300 Esslingen Order No. 844
Outside micrometer (measuring range 25–50 mm)	e.g. Mahr, D–7300 Esslingen Order No. 40 S

Renewing

1 Remove old valve seat ring by means of a ring seat turning tool.

2 Check valve guides, renew if necessary (05–285).



3 Measure basic bore D 1.

A new valve seat ring **standard dimension** may be used if the specified overlap is available.

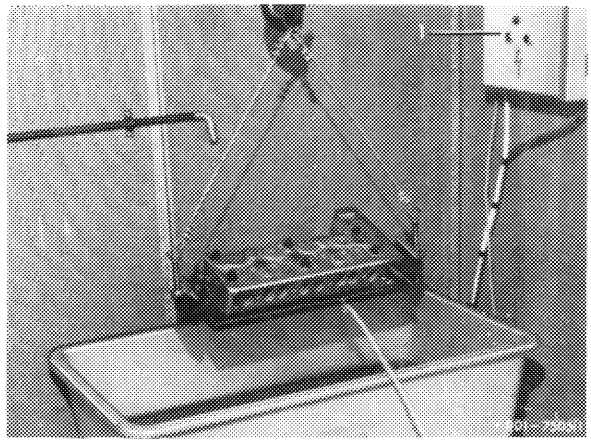
4 Machine basic bore repair stage D 1 with the valve seat ring turning tool until the bore is just clean.

5 Measure machined basic bore.

6 Machine valve seat ring repair stage until the specified overlap is attained.

7 Heat cylinder head in water bath.

8 Cool valve seat ring in liquid nitrogen.



9 Install valve seat ring with a suitable mandrel.

10 Machine valve seats (05–291).