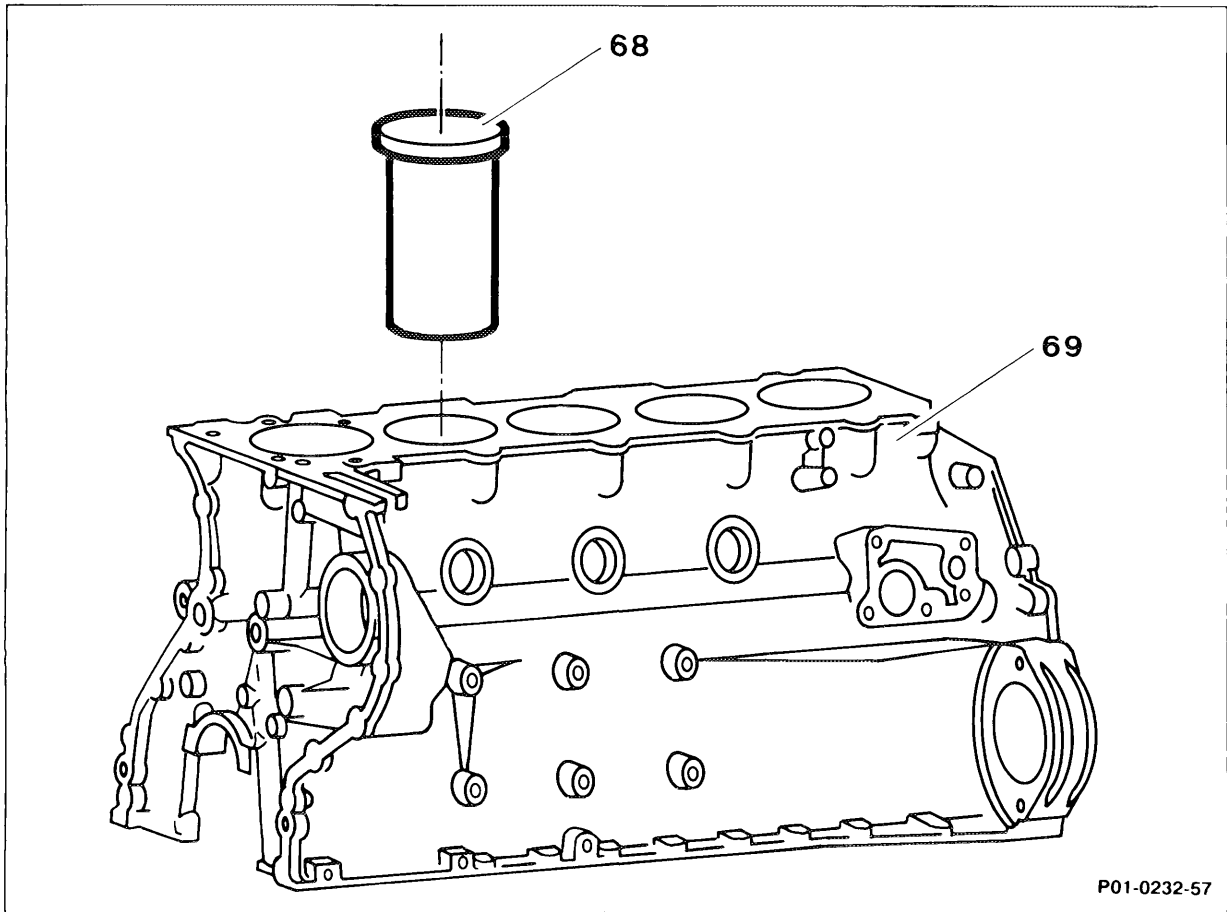


# 01-115 Boring, honing and replacement of cylinder sleeves

Preliminary operations:  
Pistons removed (03-316).



Cylinder bore .....	measure (01-110).
Cylinder sleeves (68) .....	press out, punch 603 589 00 15 00 (item 1).
Block (69) .....	clean basic bores for sleeves and check diameter (see table) with internal measuring instrument (items 2 and 3).
	<b>Note</b>
	If the permissible values are exceeded, replace block.
Cylinder sleeves .....	press in and maintain pressure for approx. 7 seconds to seat sleeve, punch 603 589 00 15 00 (item 4).

Cylinder bores . . . . . bore out to standard diameter "D" and hone, see Note in (01-110). Observe group code letters (A, X, B) (items 5 – 9).

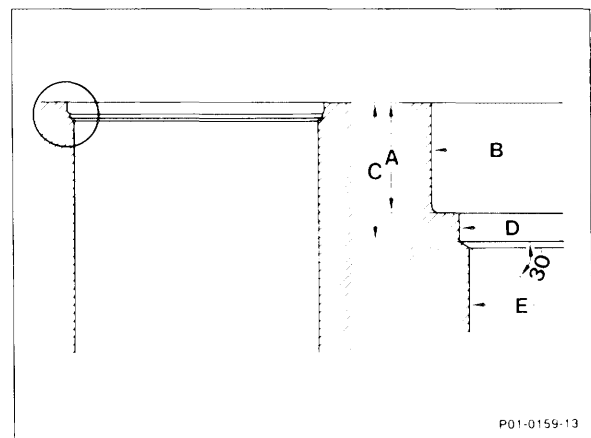
**Diameter "D" for cylinder sleeves**

Engine			602, 603
Version	Cylinder	Group code letter	Cylinder dia. D in mm
Standard 1)	1 – 4, 5, 6	A X B	87.000 – 87.006 over 87.006 – 87.012 over 87.012 – 87.018

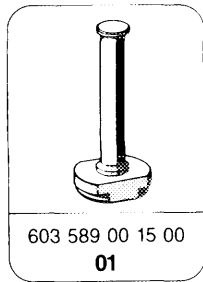
1) There are no repair stages for engines with cylinder sleeves.

**Dimensions for basic bore in block**

Bore dia. "B"	92.650 – 92.750 mm
Bore dia. "D"	90.550 – 90.650 mm
Bore dia. "E"	90.000 – 90.935 mm
Depth "A" sleeve seat	3.8 – 4.0 mm
Depth "C" sleeve seat	4.77 – 5.23 mm
Permissible out-of-round of basic bore in block	0.01 mm
Permissible out-of-round and conicity of cylinder bore	0.07 mm
Permissible roughness of cylinder bore (R3Z)	0.003 – 0.006 mm
Permissible waviness of cylinder bore	50 % of roughness
Honing angle	45°
Roughness of block parting surface	0.006 – 0.016 mm
Chamfer of cylinder bores	30°



## Special tool



## Commercially available tool

Internal measuring instrument for 50 – 100 mm dia.,  
with 0.01 mm increments and measuring point  
pressure relief

e.g. Hommel Handel  
D-5000 Köln 71  
Sunnen Grm -2125

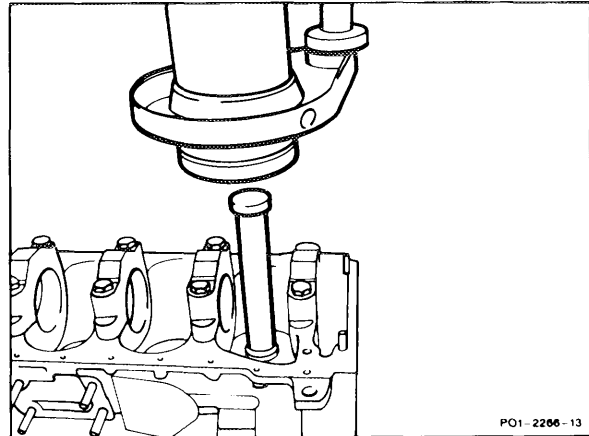
## Replacement

- 1 Press out cylinder sleeves.
- 2 Thoroughly clean basic bore.
- 3 Measure basic bore (D) in block.

If the limits are exceeded (see table) the block  
cannot be reused.

- 4 Position new cylinder sleeves and press in  
with press.

After pressing in cylinder sleeves maintain  
pressure for approx. 7 seconds with press  
(setting pressure).



## **Boring and honing**

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- 5 Mill or grind off projecting collar on sleeve. Remove as little material as possible from the block parting surface. Guide milling cutter or grinding wheel carefully over cylinder bores.
- 6 Bore out cylinder sleeves in two steps. Leave at least 0.03 mm additional material in the bores for honing.

- 7 Chamfer cylinder sleeves.
- 8 Hone cylinder bores.
- 9 Measure cylinder bores and select matching pistons (01-110).

