

05-2850 Replacing valve guides

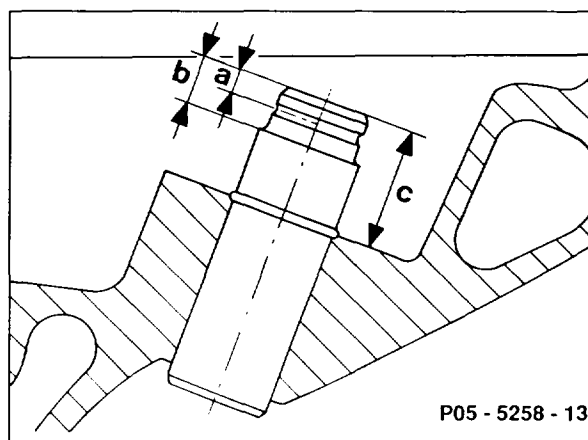
Preceding work:

Valve guides checked (05-2845).

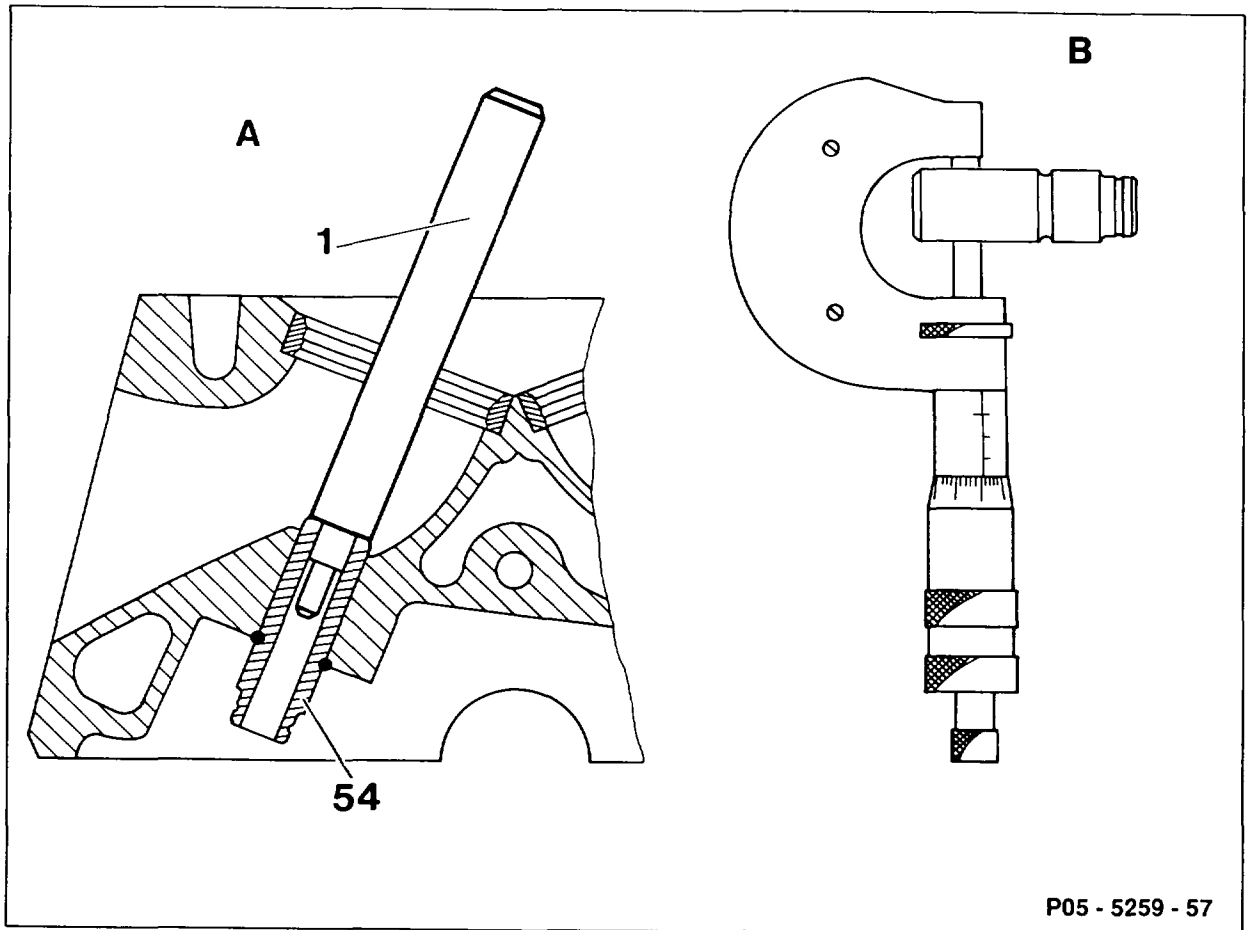
Basic bore and valve guide in cylinder head

	Standard size	Standard size I	Repair size I	Repair size II
Basic bore \varnothing in cylinder head	14.000 – 14.011	14.035	14.210	14.410
Outer \varnothing and color coding of valve guide	14.023 – 14.031	14.023 – 14.030 grey – green 14.044 – 14.051 grey – brown	14.214 – 14.222 red	14.414 – 14.422 white
Inlet part no.	–	103 050 22 24	103 050 23 24	103 050 24 24
Exhaust part no.	–	103 050 27 24	103 050 28 24	103 050 29 24
Overlap		0.012 – 0.031		

Valve guide	Inlet	Exhaust
Valve guide ID	8.000 – 8.015	9.000 – 9.015
Length	42	48
Size		
a	3.3	3.3
b	6.3 – 6.6	6.3 – 6.6
c	16.7 – 16.9	15.9 – 16.1



Knocking out valve guide



- A Valve guide knocked out
 B Measuring valve guide OD

Valve guide (54) knock out from combustion chamber side with drift (1).

Inlet drift 8 mm dia. 103 589 03 15

Exhaust drift 9 mm dia. 103 589 02 15

Checking basic bore, matching valve guide

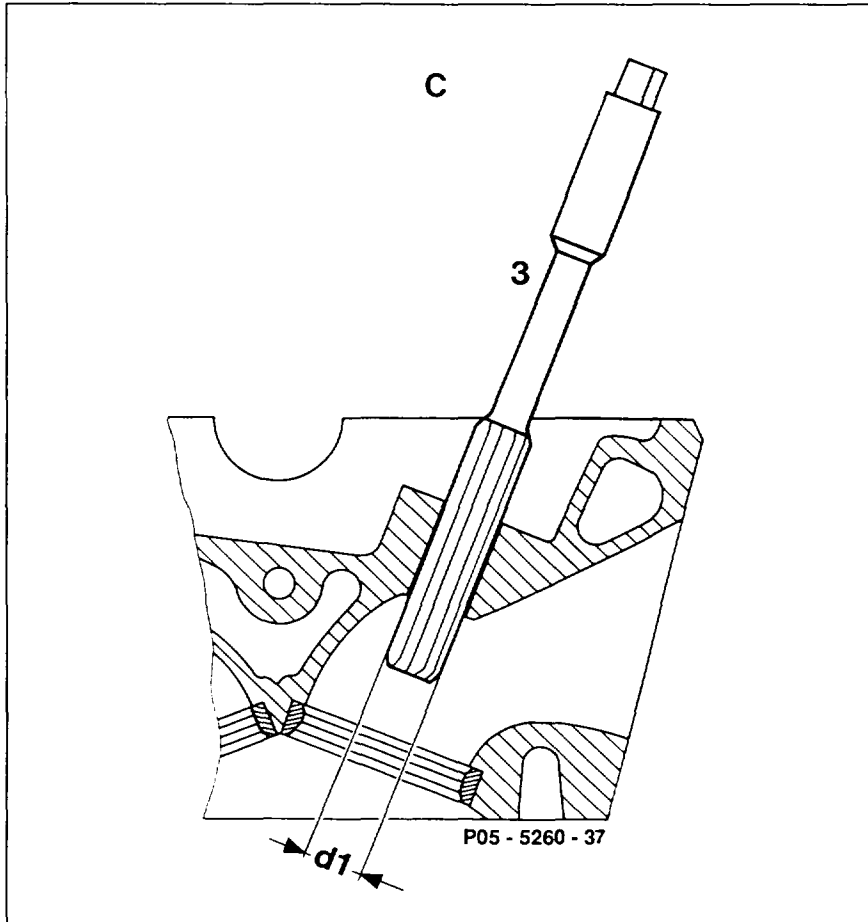
OD measure with a micrometer.

Determine which valve guide is installed, see table.

Next larger valve guide match.

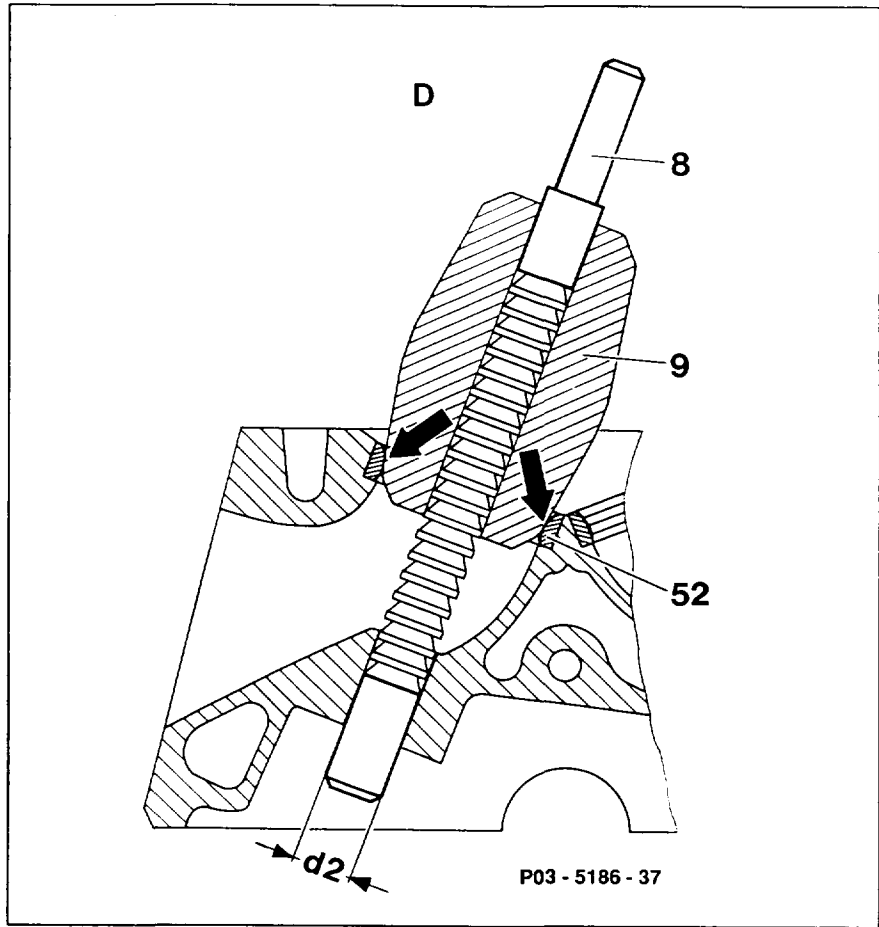
Basic bore in cylinder head according to matched valve guide file standard size I or broach repair size I.

Standard size I



Basic bore	ream with reamer.
Basic bore	ream through with reamer (3)
	110 589 03 53 00 dia. 14.035 mm.
Lubricate with petroleum	when reaming.
Apply only slight pressure when reaming and ...	do not tilt reamer (3).
Clean blades of reamer	before each reaming operation.

Repair size I (broaching basic bore with broaching needle dia. 14.21)



Matching engines – guide sleeves – broaching needles

Engine	Valve	Valve guide basic bore	Guide sleeve part no.	Page	Broaching needle part no.
103.94 103.98	Inlet	14.21 mm	102 589 08 63 00 102 589 01 63 00	A A	115 589 00 53 00
103.94 103.98	Exhaust	14.21 mm	102 589 08 63 00 102 589 00 63 00	B A	115 589 00 53 00

- Inside of valve seat rings remove all carbon deposits.
- Blades of broaching needle (8) clean with plastic brush before each broaching operation.
- Appropriate guide sleeve (9) select, see table.
- Guide sleeve (9), basic bore and broaching needle (8) moisten with engine oil.
- Guide sleeve (9) together with broaching needle (8) introduce into cylinder head.

Broaching needle (8)

insert into basic bore in broaching direction up to first blade.

Fit guide sleeve (9) onto valve seat ring (52) (arrows) and by turning center guide sleeve (9) on valve seat ring (arrows) and broaching needle (8)

in basic bore.

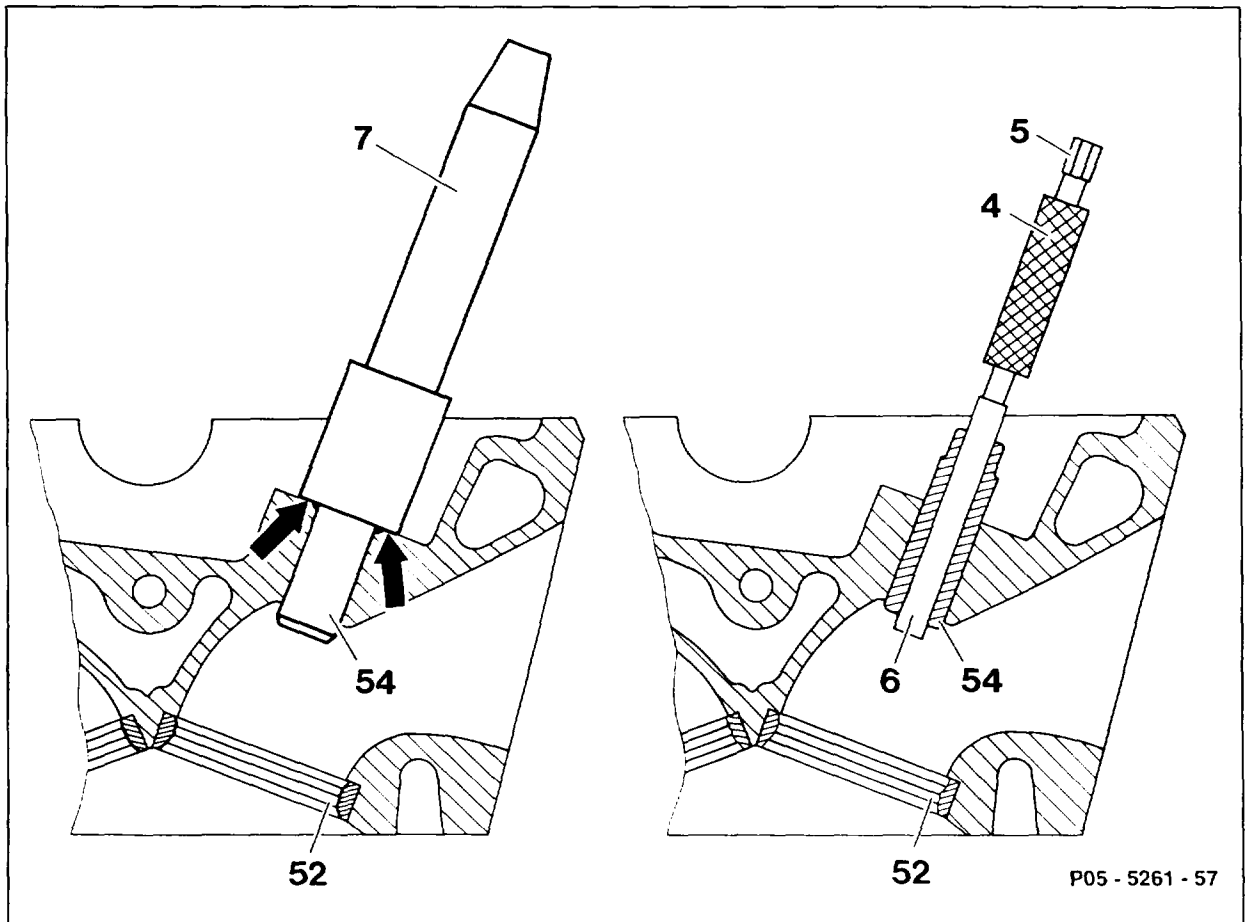


Centering must not take place on carbon residues, casting projections, inlet and exhaust passage walls.

Broaching needle (8)

press through.

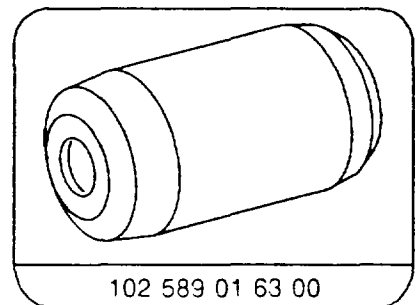
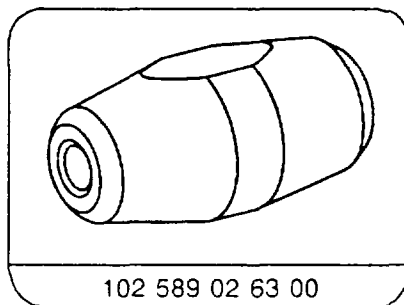
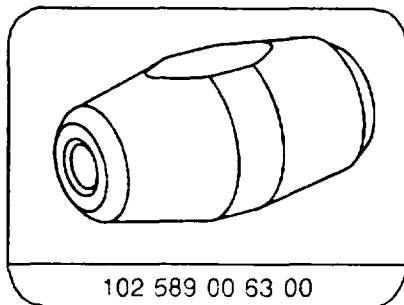
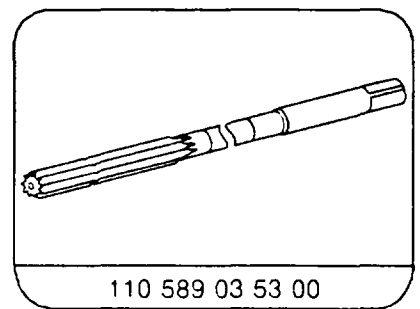
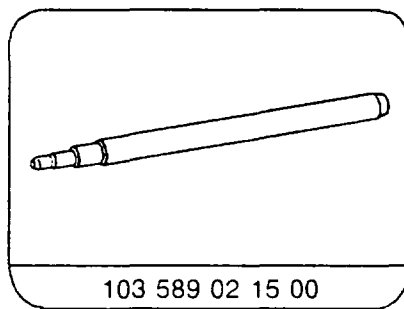
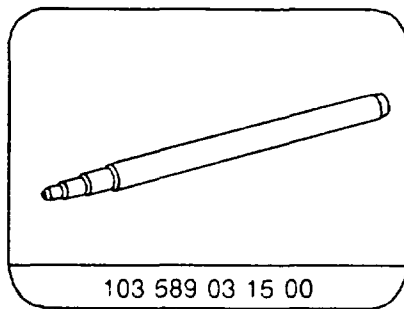
Inserting valve guide, checking ID

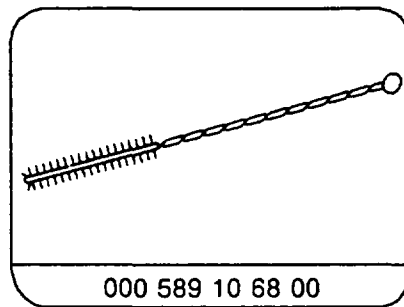
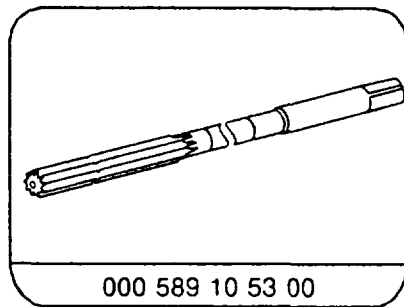
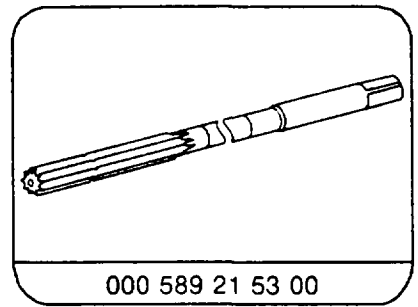
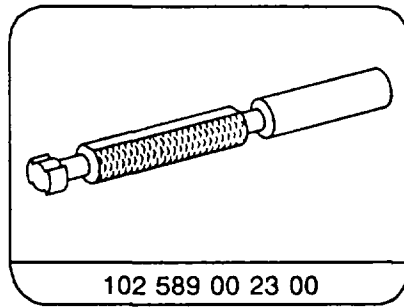
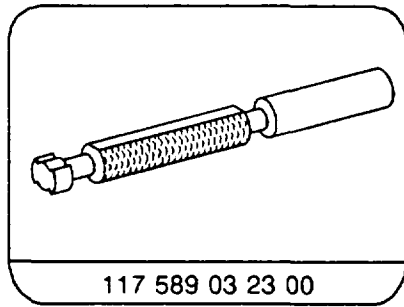
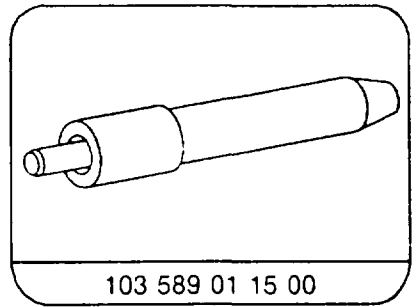
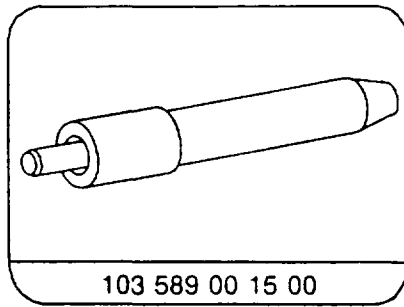
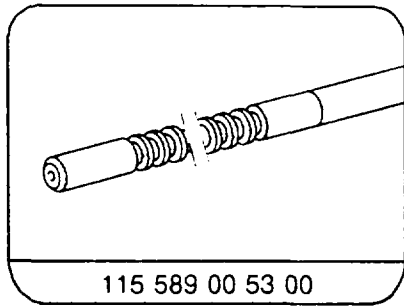


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Valve guide (54)	supercool, in liquid nitrogen (approx. 3 minutes).
If no liquid nitrogen available,	heat cylinder head in water bath to approx. 80 °C.
Valve guide (54)	knock in with drift (7) as far as stop (arrows).
Inlet drift 103 589 00 15 00.	
Exhaust drift 103 589 01 15 00.	
Valve guide (54) when cylinder head cooled	check if tightly seated.
ID of valve guide (54)	check with gauging drift (4).
Inlet gauging drift 102 589 00 23 00	
Exhaust gauging drift 117 589 03 23 00	
It must be possible to insert the go side (6) of the gauging drift (4)	fully.
If necessary, ream ID	with reamer.
Inlet reamer 000 589 21 53 00	
Exhaust reamer 000 589 10 53 00	
Valve seat (52)	check concentricity, re-work if necessary (05-2910).

Special tools





Commercially available tool

Cylinder head tensioning device

eg. Hunger
D-81375 München
Order no. 221.60.000

Micrometer 0.25 mm

Note

Inlet, exhaust valve guides made of improved material.

	1st version	2nd version
Inlet	brass-coloured	copper-coloured
Exhaust	brass-coloured	brass-coloured

Production breakpoint: December 1989

Model	Engine	Engine end no.	
		manual transmission	automatic transmission
124.026	103.940	029502	076413
124.030 124.050 124.090	103.983	035036	196370
124.226	103.943	000508	001192
124.230 124.290	103.985	002401	009671
126.020	103.941	004458	014693
126.024 126.025	103.981	007781	106846
201.029	103.942	016242	041289