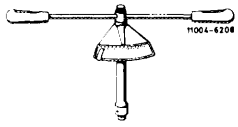
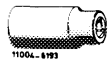
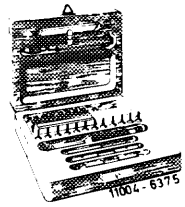
Test values

Engine	Injection nozzles Bosch designation	Opening pressure in bar gauge pressure[1] with new injection nozzles	Opening pressure in bar gauge pressure[1] with used injection nozzles at least
Standard version and (AUS) (J)			
615.913/940	DN 0 SD 1510	115–123	100
615.941 616 (48 kW) 617 (59 kW)	DN 0 SD 220		
616 (53 kW) 617 (65 kW)	DN 0 SD 240[3]		
(E) (S) starting 1979 Identification (S) only injection pump with lead-sealed governor housing.			
615.913/940	DN 0 SD 1510	115–123	100
615 616 (48 kW) 617 (59 kW)	DN 0 SD 220		
616 617	DN 0 SD 240[2]		
(USA) (ZA) starting 1979 Identification Injection pump with green type-rating plate.			
616 617	DN 0 SD 240[2]	115–123	100

[1] The difference in opening pressure of injection nozzles within one engine should not amount to more than 5 bar gauge pressure.
[2] Starting 1979 nozzle holder with edge-type filter.
[3] Engine 616, 617 starting from increased output.

Tightening torques	Nm
Injection nozzle upper and lower half	70–80

Special tools

Torque wrench 1/2" square, 40—130 Nm		000 589 22 21 00
Socket 27 mm, 1/2" square for injection nozzle		001 589 65 09 00
Cleaning kit		000 589 00 68 00

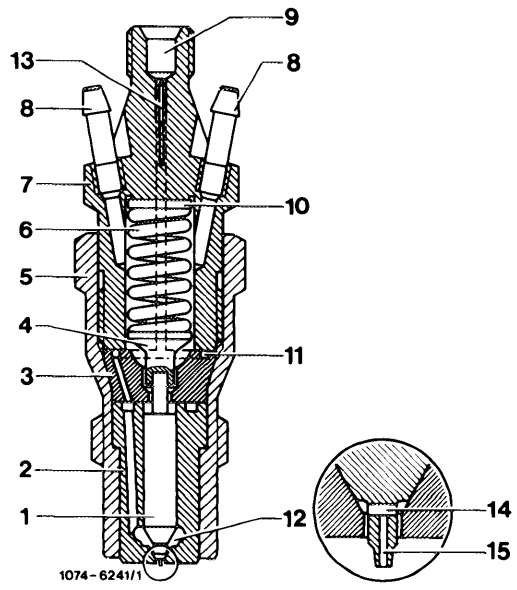
Conventional tools

Tester EFEP 60 H	e.g. made by Bosch, D-7000 Stuttgart Order no. 0 681 200 502
Cleaning needle 0.13 mm dia	e.g. made by Bosch, D-7000 Stuttgart Order nor. KDEP 2900/3

Note

The injection nozzle with Bosch designation DN 0 SD 240 is a perforated pintle nozzle. It differs from pintle nozzle by a crosswise bore and a longitudinal bore (14 and 15) in throttle pintle. In addition, a maintenance-free rod-type filter (13) is pressed into injection nozzle holder top (7).

The advantage of a perforated pintle nozzle is better injection at lower volume and less load, as well as a reduction of coking on ring gap.

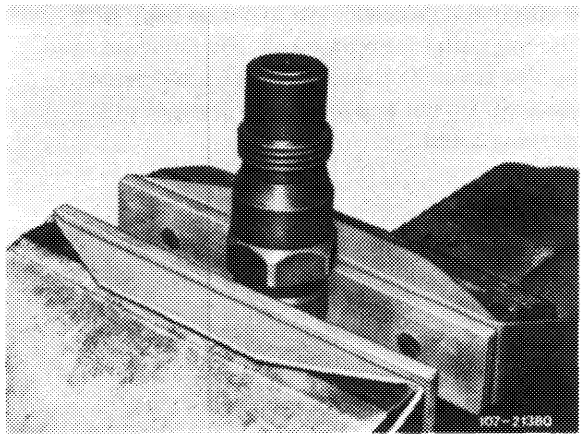


1 Nozzle needle
2 Nozzle body
3 Nozzle holder element
4 Pressure pin
5 Injection nozzle holder bottom
6 Compression spring
7 Injection nozzle holder top
8 Leak oil connection
9 Fuel feed
10 Steel washer
11 Ring groove and feed bores
12 Pressure chamber in nozzle body
13 Rod-type filter
14 Crosswise bore
15 Lengthwise bore

Disassembly

1 Clamp injection nozzle holder top (7) with protective jaws into vise in such a manner that the leak oil line connections are not damaged.

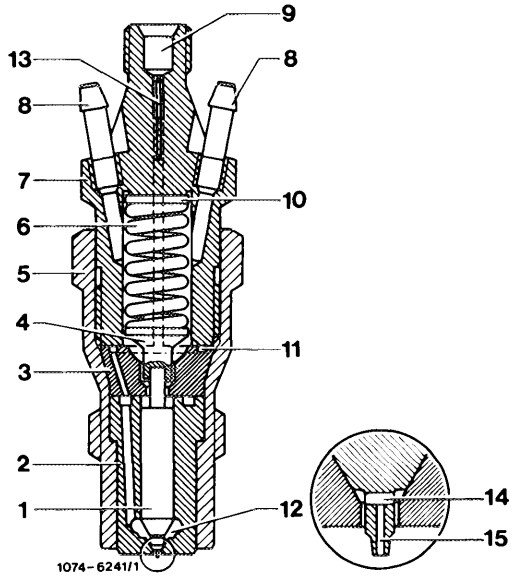
2 Loosen injection nozzle holder bottom (5) with socket wrench insert and screw off.



5 Injection nozzle holder bottom
7 Injection nozzle holder top

3 Remove steel washer (10), compression spring (6), pressure pin (4), nozzle holder element (3) and nozzle body (2) with nozzle needle (1).

Attention!
During disassembly make sure that the nozzle body, the nozzle needle and the individual components are not mixed up among each other.

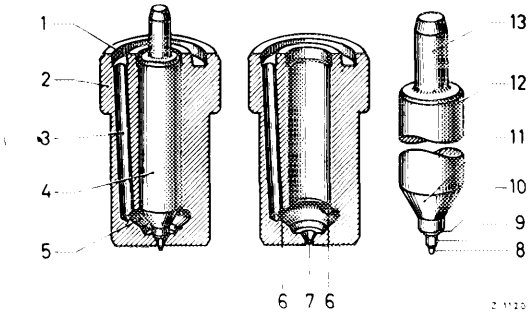


Cleaning

4 Brush off combustion deposits outside on face of nozzle body (2), mainly around nozzle mouth, by means of a brass brush.

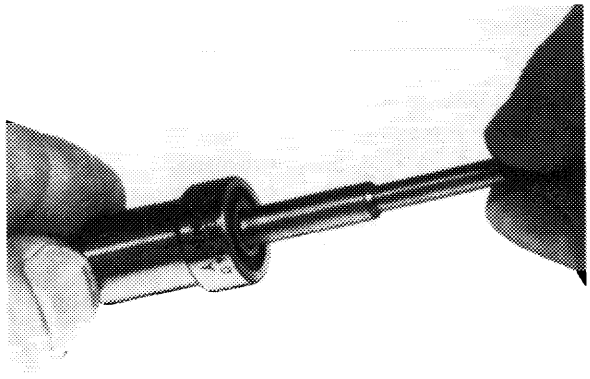
Touch up nozzle holder element (3) and nozzle body (2) on face of both sides on a surface plate.

5 Clean pressure chamber (5) of nozzle body by means of ring groove scraper.



1 Ring groove
2 Nozzle body
3 Feed bore
4 Nozzle needle
5 Pressure chamber
6 *Mouth of feed bores in pressure chamber*
7 Nozzle mouth
8 Spray pintle
9 Throttle pin
10 Needle seat
11 Pressure shoulder
12 Needle stem
13 Pressure pin

6 Clean nozzle needle seat in nozzle body with cleaning cutter from inside out. Do not clean from outside (to guide cleaning cutter or to prevent canting). Do not exert excessive pressure with cleaning cutter.



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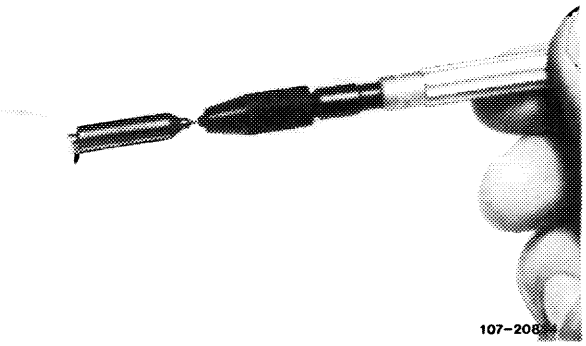
7 Clean longitudinal and cross bore of nozzle needle with cleaning needle 0.13 mm dia.



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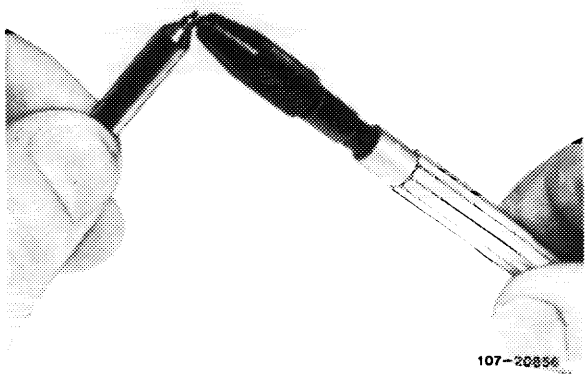

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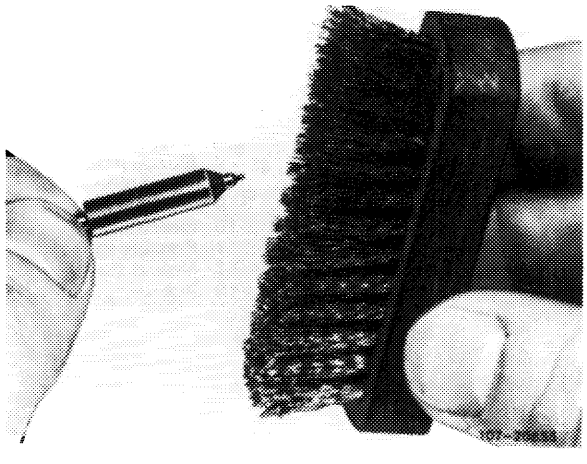
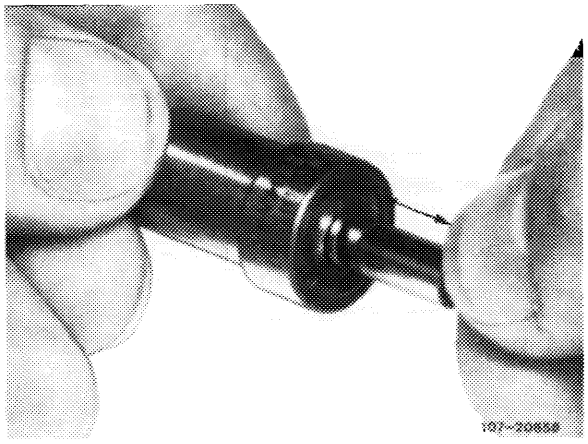
8 Clean nozzle needle with brass brush.



Testing nozzle needle

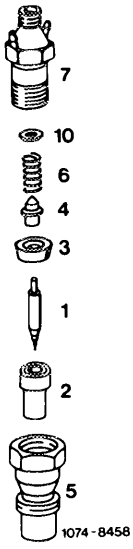
9 Visual test. Upon cleaning, test used nozzles visually. Test nozzle needle for dented or rough needle seat and for worn or damaged spray pintle. Replace damaged nozzles.

10 Slide test. For this purpose, immerse nozzle needle and nozzle body in filtered diesel fuel and insert nozzle needle into nozzle body. With nozzle needle held vertically the nozzle needle, which is pulled out by approx. one third, should slide back on its seat under its own weight. Replace injection nozzle, if required.



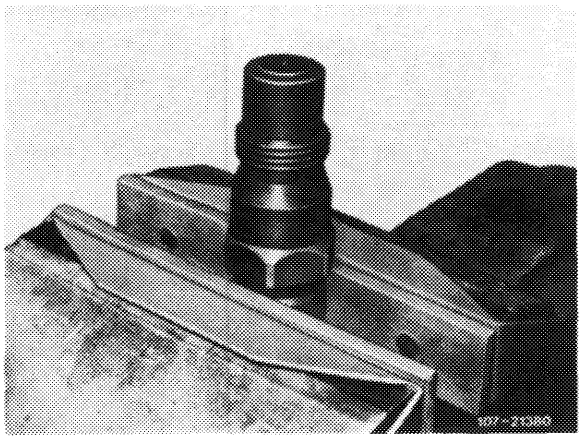
Assembly

11 Insert all parts in vice versa sequence into injection nozzle holder bottom (5) and screw on injection nozzle holder top (7), while inserting pressure pin (4) with bore into nozzle needle (1).



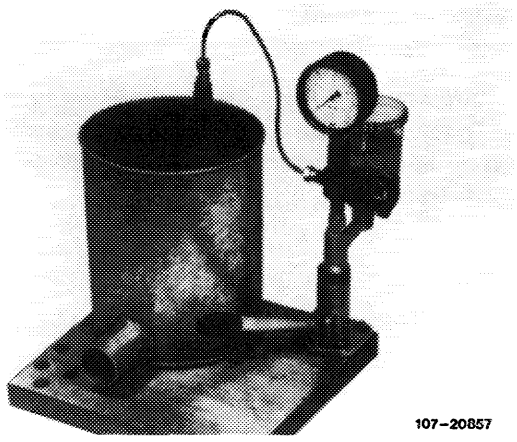
1 Nozzle needle
2 Nozzle body
3 Nozzle holder element
4 Pressure pin
5 Injection nozzle holder bottom
6 Compression spring
7 Injection nozzle holder top
10 Steel washer

12 Clamp injection nozzle holder top (7) with protective jaws into vise and tighten injection nozzle holder bottom (5) to 70–80 Nm.



Testing

13 Test injection nozzles for jet, buzzing noise, opening (ejection) pressure and for leaks (07.1—135).



Adjusting

14 Install or remove steel washers (10) between compression spring (6) and injection nozzle holder top (7) to maintain specified ejection (opening) pressure, if required for adjustment.

Putting in = increased ejection pressure
Taking out = decreased ejection pressure

Washers are available 1.0 to 1.8 mm thick in steps of 0.05 mm. An increase of preload by 0.05 mm increases ejection pressure by approx. 3.0 bar gauge pressure.