



UNIVERSAL GLOW PLUG REMOVAL KIT BASIC

Manual

90417800 / 90417780 / 90417790 / 90417820



SAFETY NOTICE

To understand the functioning of the tools, is it necessary to read the manual first!

- > Read these instructions before assembling, during installation and throughout use and in the proper sequence
- > Always refer to the OEM manufacturer's instructions and service manuals for the latest data and to maintain the correct sequence
- > These work instructions and the recommended tools are meant to serve as aides only and are by no means a guarantee for certain results.
- > This tool kit is a special collection and it has been tested and used successfully on several occasions. It is of the utmost importance to maintain the correct procedure as per the instructions
- > The use of the tools should only be carried out by qualified personnel!



ATTENTION

Special caution



CORRECT



LIGHT BULB

Hint or recommendation



WRONG



SAFETY GOGGLES

Wearing safety goggles
necessary

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UNIVERSAL GLOW PLUG REMOVAL KIT BASIC M8x1/M9x1/M10x1/M10x1.25

Part no. 90417800

No.	Part no.	Description	90417800	90417780	90417790	90417820
1	4024030	Angle Gauge 60° / 90° / 120°	1	1	1	1
2	1131025	Stud-Remover Ø 2,5mm,	1	1	1	1
3	1131035	Stud-Remover Ø 3,5mm	1	1	1	1
4	1131040	Stud-Remover Ø 4,0mm	1	1	1	1
5	60421150	Threaded Insert Installation Tool M8x1 M9x1	1	1	1	not included in the set
6	60417150	Threaded Insert Installation Tool M10x1 M10x1,25	1	not included in the set	not included in the set	1
7	20402600	HSS Drill Bit Ø 2.60 mm, Long Version	1	not included in the set	not included in the set	1
8	20403500	HSS Drill Bit Ø 3.50 mm, Long Version	1	not included in the set	not included in the set	1
9	20404000	HSS Drill Bit Ø 4.0 mm, Long Version	1	1	1	1
10	60417551	Drill Sleeve internal diameter 4.0 mm, external diameter 5.4 mm	1	not included in the set	not included in the set	1
11	6041749	Drill Sleeve internal diameter 3.5 mm, external diameter 5.4 mm	1	not included in the set	not included in the set	1
12	6041641	Drill Sleeve internal diameter 2.6 mm, external diameter 4.4 mm	1	1	1	not included in the set
13	6041751	Drill Sleeve internal diameter 2.6 mm, external diameter 4.8 mm	1	not included in the set	not included in the set	1
14	6049024	Cylindrical Brush Ø 4,7mm	1	1	1	1
15	6049025	Cylindrical Brush Ø 5,3mm	1	1	1	1
16	6049027	Cylindrical Brush Ø 7,0mm	1	1	1	1
17	6049028	Cylindrical Brush Ø 8,0mm	1	1	1	1
18	6049029	Cylindrical Brush Ø 8,5mm	1	1	1	1
19	60416350	Step Drill Bit for Kit M8x1	1	1	not included in the set	not included in the set
20	60416435	Step Drill Bit for Kit M9x1	1	not included in the set	1	not included in the set
21	60417355	Step Drill Bit for Kit M10x1 / M10x1.25	1	not included in the set	not included in the set	1
22	6041643	Tap UNF No.12-28	1	1	1	not included in the set
23	60416473	Spindle M8 UNF No.12-28	1	1	1	not included in the set
24	6041543	Tap UNF 1/4"	1	not included in the set	not included in the set	1
25	60418870	Spindle M8 UNF 1/4"	1	not included in the set	not included in the set	1
26	60416345	Tap M8x1	1	1	not included in the set	not included in the set
27	60416445	Tap M9x1	1	not included in the set	1	not included in the set
28	60418745	Tap M10x1	1	not included in the set	not included in the set	1
29	60417445	Tap M10x1,25	1	not included in the set	not included in the set	1
30	151.20425	Allen Key Hex Drive 2.5 mm	1	1	1	not included in the set
31	6041667	Tool Holder for Step Drill Bit M8x1 & M9x1	1	1	1	not included in the set
32	151.2103	Allen Key Hex Drive 3 mm	1	not included in the set	not included in the set	not included in the set
33	9041736	Tool Holder for Step Drill Bit M10x1 & M10x1.25	1	not included in the set	not included in the set	1
34	60416533	Support Sleeve	1	1	1	1
35	60416536	Extraction Adapter 4 pc.	1	1	1	1
36	6041632	Universal Drill Bit Holder	1	1	1	1
37	151.2042	Allen Key Hex Drive 2 mm	1	1	1	1
38	6041738	Tool Holder with Ratchet „Keeper“ (long) M3-M8	1	1	1	1

BEFORE STARTING WORK



In preparation all obstructions and all attachments that may hinder work on the glow plugs must be removed e.g. the plastic cover, the cable loom across the valve cover, high pressure pipes from the rail to the injector, possibly the intake manifold etc. have to be .

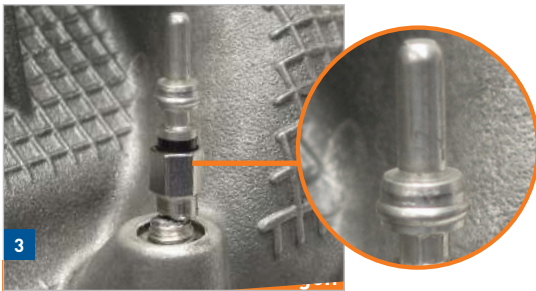
1. DETERMINING THE GLOW PLUG BORE AXIS IN THE CYLINDER HEAD

For an easier determining the alignment of the glow plug shaft, it is recommended to remove the next following glow plug from the cylinder head and instead, screw in the appropriate Threaded Insert Installation Tool M8x1, M9x **60421150** ⑤ or M10x1/M10x1,25 **60417150** ⑥. The knowledge gained here is very useful and helpful for the work steps „drilling“ and „taping“.



2. REMOVING THE CENTRE ELECTRODE

VERSION A: GLOW PLUG WITH PIN TERMINAL



Place the Stud Puller $\varnothing$ 4.0 mm **1131040** ④ on the terminal of the centre electrode. With a 1/4" ratchet break off the centre electrode by turning the Stud Puller several times clockwise.



Remove the freed parts

VERSION B: GLOW PLUG WITH TREADED TERMINAL



Hammer the Stud Puller $\varnothing$ 3.5mm **1131035** ③ on the threaded terminal of the glow plug. With a 1/4" ratchet break off the centre electrode by turning the Stud Puller several times clockwise.



Remove the freed parts



... continue on page 12.

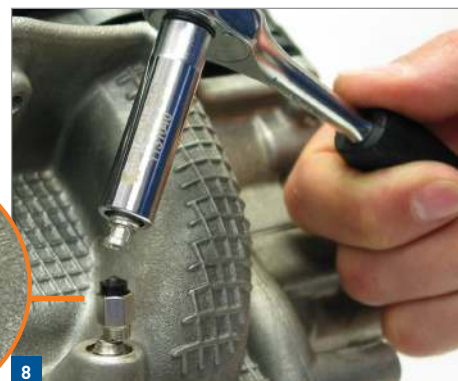


... continue on page 12.



If, even after a several turns of the Stud Puller, it is not possible to remove the centre electrode by hand, we advice to use set 60390755 (see recommended accessories page 22).

2.1 THE CENTRE ELECTRODE BREAKS IMMEDIATELY BEHIND THE CAP OF THE ELECTRICAL CONNECTION



Remove the freed parts.



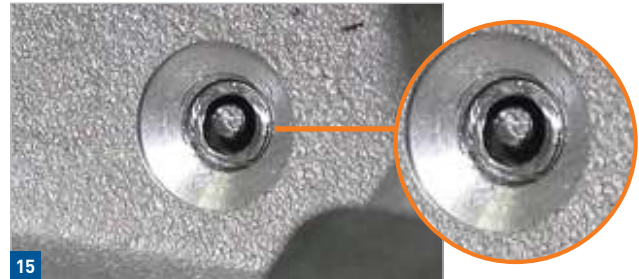
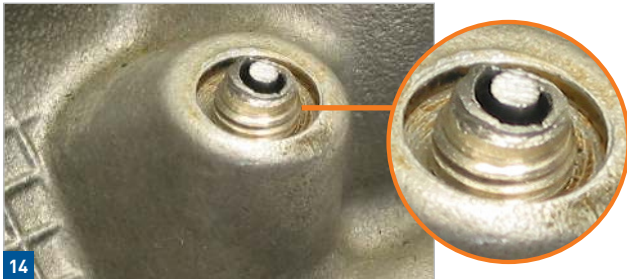
Hammer the appropriate **Stud Puller** Ø 2.5 mm **1131025** ② / Ø 3,5 mm **1131035** ③ / Ø 4 mm **1131040** ④ on the centre electrode and with a 1/4" ratchet break off the centre electrode by turning it several times clockwise. Remove the freed parts



... continue on page 12.

2.2 THE CENTRE ELECTRODE DOES NOT BREAK OFF AT THE BOTTOM OR STEP 2.1 IS NOT POSSIBLE

Possible starting situation:



Select the suitable Drill Sleeve (Ø 2.6 mm **6041641** (12) / Ø 2.6 mm **6041751** (13) / Ø 3.5 mm **6041749** (11) / Ø 4.0 mm **60417551** (10)):

The appropriate Drill Sleeve must meet the following criteria:

- Inner diameter of the Sleeve is equal to the diameter of the centre electrode
- The outer diameter of the Sleeve must slide into the bore of the body of the glow plug without play.

Diameter centre electrode



Inner diameter body of the glow plug

Glow plug

Inner diameter sleeve

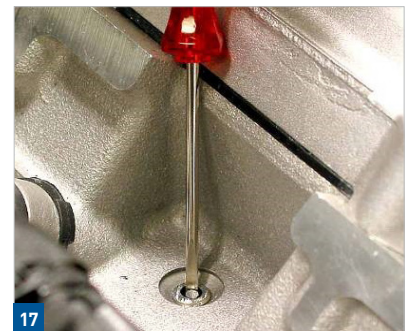


Outer diameter sleeve

Drill Sleeve



Remove the possible burr between glow plug and centre electrode.



Select the appropriate Drill Bit:

- Drill Bit diameter is equal to the inner diameter of the Drill Sleeve

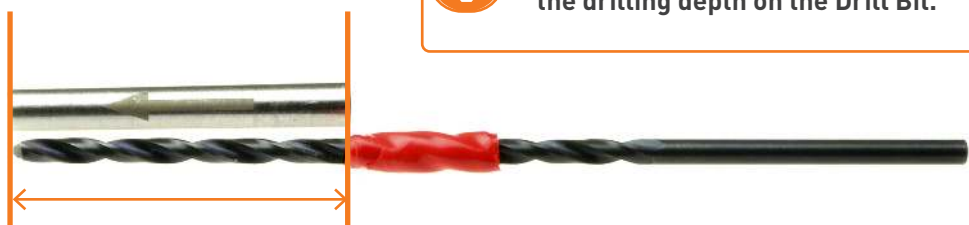
Inner-Ø Drill Sleeve	Part no. Drill Sleeve		Part no. Drill Bit
Ø 2.6 mm	6041641	→	20402600
Ø 3.5 mm	6041749	→	20403500
Ø 2.6 mm	6041751	→	20402600
Ø 4 mm	60417551	→	20404000



Diameter Drill Bit



Determine drilling depth:



! ATTENTION
mind the maximum drilling depth!

💡 Apply insulating tape or a paint mark to mark the drilling depth on the Drill Bit.

The max. drilling depth is equal to the length of the Drill Sleeve

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Place the appropriate **Drill Sleeve** onto the centre electrode and hammer it halfway into the glow plug.

For conical Drill Sleeves, the installation direction **(see arrow)** must be observed.



TIP

If the Drill Sleeve slides into the plug very easily, it can be slightly grained on the outer circumference!

Clamp the suitable Drill Bit into a power drill and cautiously drill out the centre electrode to the marking (**insulating tape**). Lift and lubricate the Drill Bit frequently.

Remove the chips by compressed air, a aspirator and/or a magnet.



Lubricate again and again!



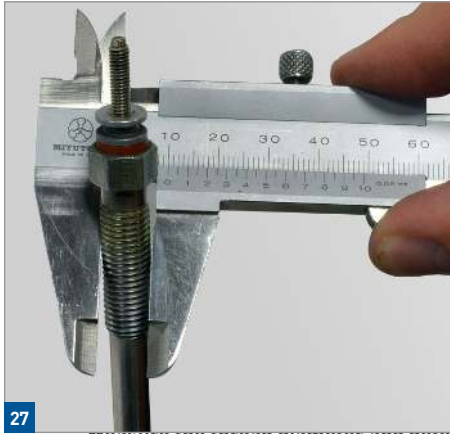
Wearing safety goggles necessary

Remove the Drill Sleeve from the glow plug.



3. SELECTING THE APPROPRIATE SPECIAL DRILL BIT AND HOLDER 1

Measure of the glow plug the thread diameter, thread pitch and length.

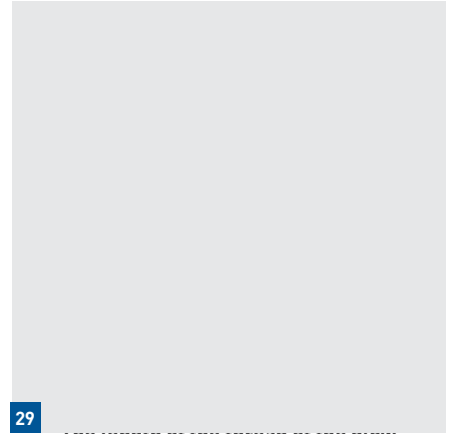


27

Measure the thread diameter and determine the thread pitch of the glow plug



28



29

The length of the thread of the glow plug is the basis for how deep the hole needs to be drilled in the glow plug

Select the matching special step drill with drill holder:

Glow plug		Drill Bit		Drill holder
M8x1	→	6041635	+	6041667
M9x1	→	60416435	+	6041667
M10x1, M10x1.25	→	60417355	+	9041736

30

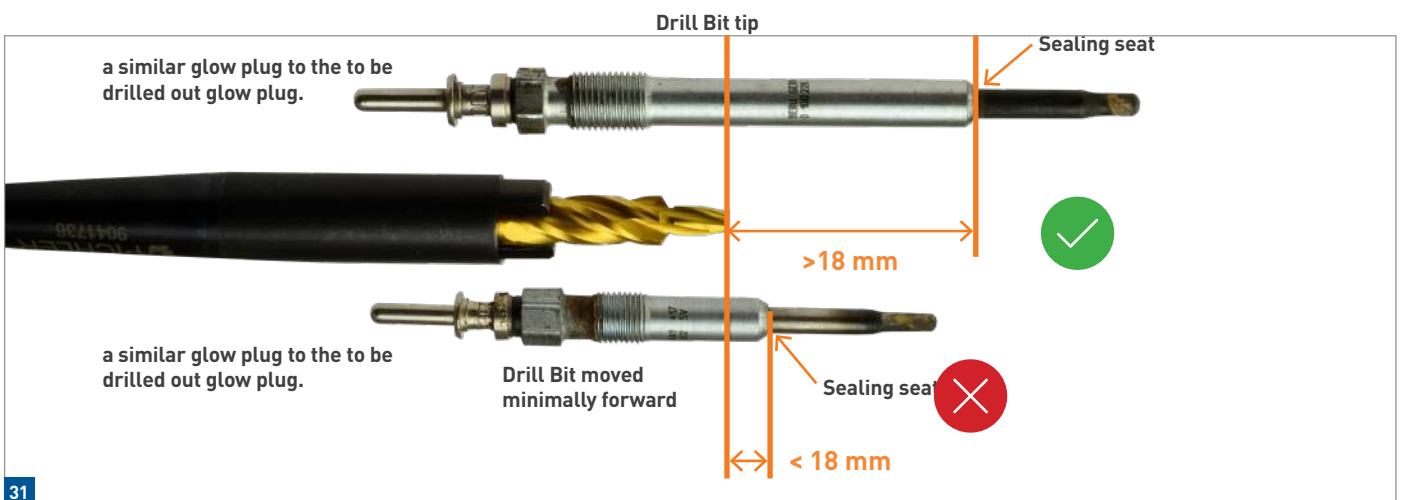


Special Drill Bit + Drill holder

The following criteria must be observed before the boring process:



- The distance from the Drill Bit tip to the sealing seat of the glow plug may not go below 18 mm when the glow plug thread is completely drilled out.
- It must be possible to completely drill out the glow plug thread. So pay attention to the clamping length of the Step Drill Bit in the individual Drill Bit Holders.



31

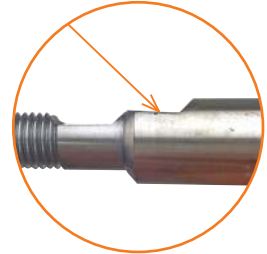


In the rare case of an extra short glow plug (distance from the end of the thread to the sealing seat is less than 18 mm), is there the possibility to use the Drill Bit Holder 6041876 with the Step Drill Bit 60418756. (see recommended accessories, page 23)

If the required drilling depth cannot be reached, is it possible to clamp the **Step Drill 60417355** about 7 mm further out of **Drill Bit Holder 9041736**.



IMPORTANT: Pay attention to the flat shank of the Drill Bit when clamping.



ATTENTION

The Drill Bit must be clamped in the Drill Bit Holder on the flat shank.

4. DRILLING OUT OF THE CORE OF THE GLOW PLUG THREAD – PART 1

With the appropriate **Stepped Drill Bit** clamped in the **corresponding Drill Holder** bevel the glow plug by hand. (3-4 turns)



Drill the core out of the glow plug thread to a depth of 4 - 5 mm with the multi-phase drill bit chucked into a drill.



Cross section of the cylinder head and glow plug shaft



Check the alignment with a screwed-in Insert Installation Tool.

Remove the chips from the glow plug by compressed air, a aspirator and/or a magnet.



Wearing safety goggles necessary



5. TAPPING THE EXTRACTOR THREAD IN THE GLOW PLUG – PART 1

Clamp the correct tap UNF No.12x28 [6041643 \(22\)](#) for glow plug threads M8x1 and M9x1 or UNF 1/4" [6041543 \(24\)](#) for glow plug threads M10x1 and M10x1.25 in the Tap Holder [6041632 \(36\)](#) or the Tap Holder with Ratchet „Keeper“ [6041738 \(38\)](#). Carefully tap far as possible a thread in the glow plug.



Check the alignment with a screwed-in Insert Installation Tool.



Wearing safety goggles necessary



Remove the chips from the glow plug by compressed air, a aspirator and/or a magnet.



6. DRILLING OUT OF THE CORE OF THE GLOW PLUG THREAD – PART 2

Completely drill out the core over the remaining length of the glow plug thread with the **previously in section 3 selected Drill Bit**. Lift the Drill Bit frequently.



IMPORTANT

Intermediate measuring prevents the glow plug from being drilled too deep or not deep enough.



Cross section of the cylinder head and glow plug shaft



Remove the chips from the glow plug by compressed air, an aspirator and/or a magnet.



The use of drilling and cutting oil is recommended. (e.g. Bio-Cut [99900175](#))



Check the alignment with a screwed-in Insert Installation Tool.

7. TAPPING THE EXTRACTOR THREAD IN THE GLOW PLUG – PART 2

Clamp the appropriate Tap UNF No.12x28 [6041643](#) (22) for M8x1/M9x1 Glühkerzengewinde glow plug thread or UNF 1/4" [6041543](#) (24) for M10x1/M10x1,25 glow plug threads into the Tap Holder [6041632](#) (36) or Tap Holder with Ratchet „Keeper“ [6041738](#) (38) and tap carefully and as deep as possible, a thread in the glow plug.

Remove the chips from the glow plug by compressed air, an aspirator and/or a magnet.



Check the alignment with a screwed-in Insert Installation Tool.



8. RETAPPING THE THREAD IN THE CYLINDER HEAD

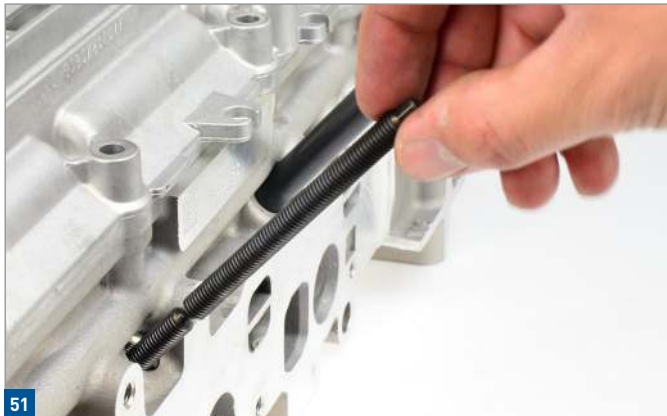
Insert the appropriate tap for **M8x1** 60416345 (26) **M9x1** 60416445 (27) **M10x1** 60418745 (28) **M10x1.25** 60417445 (29) into the tap holder 6041632 (36) or into the keeper 6041738 (38) lubricate with grease and cleanly recut the fastening thread in the cylinder head. Use a vacuum cleaner, a magnet or compressed air to remove dirt and chips from the glow plug shaft and the glow plug.



Wearing safety goggles necessary

9. REMOVING THE GLOW PLUG

Screw the appropriate **Spindle** for **M8x1/M9x1** → UNF No.12x28 60416473 (23) or for **M10x1/M10x1,25** → UNF 1/4" 60418870 (25) into the remains of the glow plug and tighten it with a spanner 5mm.



Guide the **Support Sleeve** 60416533 (34) (can be used on both sides, depending on the space) over the threaded spindle and screw the **Extraction Adaptor** 60416536 (35) onto the Spindle.



By turning the **Extraction Adapter** with a spanner 13 and counter-holding the Spindle with a spanner 5, pull out the glow plug remains.



If the Extraction Adapter turns sluggishly, it should be unscrewed from time to time (1-2 turns back) and the spindle be tapped with a hammer, on the hexagon end in the direction of the sealing surface!



Remaining part of the glow plug

If it is not possible to place the support sleeve completely adjacent, it is also possible to pull out the remainder of the glow plug by means of a slide hammer either **60390750** or **1030210** over the Spindle and adapter **6041798** (see recommended accessories). There is also the option of ordering a longer extraction spindle and support sleeve in the current sizes in the recommended accessories.

10. CLEANING THE GLOW PLUG SHAFT

Measure the diameter of the heating rod and the body of the glow plug of the new to be installed glow plug.



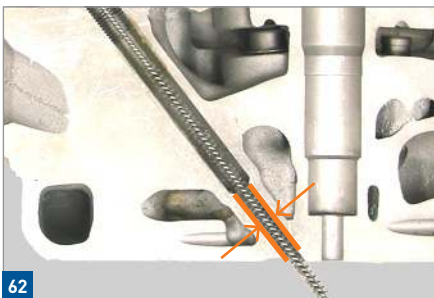
Heating rod



The body of the glow plug

The part of the shaft for the heating rod

Based on the previously measured diameter of the glow element, select the pipe brush with the same or next larger diameter.

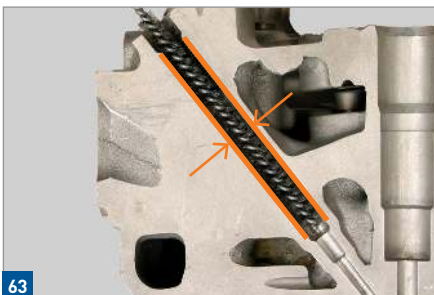


Cross section of the cylinder head and glow plug shaft

Pipe Brushes	Part no.
Steel Wire Tube Brush Ø 4,7 mm	6049024
Steel Wire Tube Brush Ø 5,3 mm	6049025

The part of the shaft for the body of the glow plug

Based on the previously measured diameter of the body of the glow plug, select the pipe brush with the same or next larger diameter.



Cross section of the cylinder head and glow plug shaft

Pipe Brushes	Part no.
Steel Wire Tube Brush Ø 7 mm	6049027
Steel Wire Tube Brush Ø 8 mm	6049028
Steel Wire Tube Brush Ø 8,5 mm	6049029



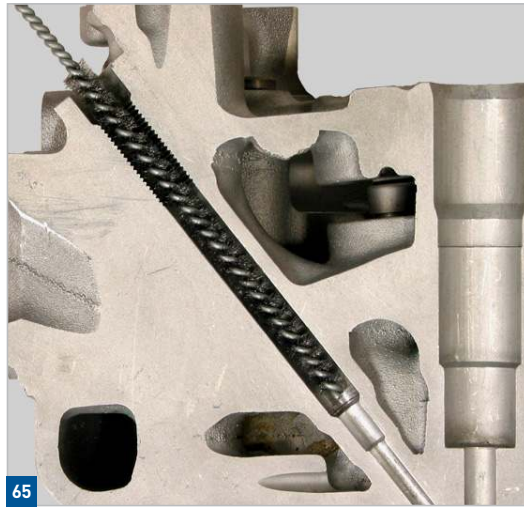
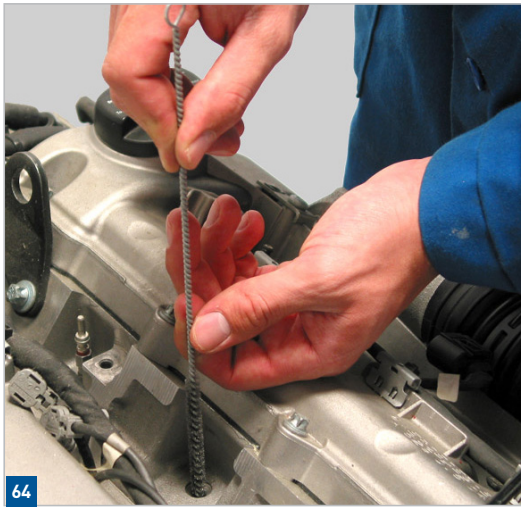
Some engine manufacturers require that the work only is carried out with a brass brush, because this achieves a gentler cleaning.

PIPE BRUSH WITH STEPPED DIAMETERS 4, 6 AND 9.0MM

9049026



Use the appropriate pipe brush to remove the carbon deposits from the glow plug shaft and remove them with an aspirator.



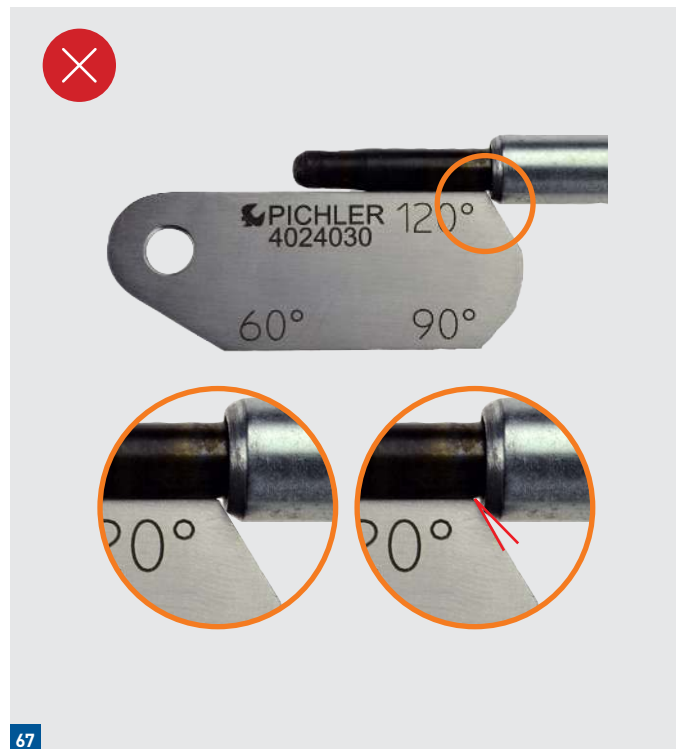
Cross section of the cylinder head and glow plug shaft

Ensure that the glow plug mounting thread in the cylinder head is completely clean. If necessary, rethread the glow plug fastening thread in the cylinder head as described under point 8.

11. DETERMINING THE APPROPRIATE GLOW PLUG SHAFT REAMER

Determine of the removed and cleaned glow plug or at a new to be installed glow plug, the seat angle using the Angle Gauge **4024030** ①.

Example: glow plug with sealing seat angle 60°



12. REAMERS TABLE

This table can be used to select the appropriate reamer or components. The compatibility of the individual parts can be determined by the coloured markings in the table.

SET Part no.		INDIVIDUAL PARTS Part no.									
Reamer		Dimensions reamer in mm 						Guide Bush Length (mm)		Actuator 	
	Length	Part no.	∠°	Ø1	L	Ø2	Ø3		Length inside Ø		
M8x1 / 90° 6041625	162	6041628	90°	4,7	25,4	6,9	4,8	M8x1 6041627	38 4,8	No. 1 6041626	
M8x1 / 120° 60416225	162	60416228	120°	4,7	25,4	6,9	4,8	M8x1 6041627	38 4,8	No. 1 6041626	
M9x1 / 90° 60416215	162	6041628	90°	4,7	25,4	6,9	4,8	M9x1 60416027	45 4,8	No. 1 6041626	
M10x1 / 60° 6041725	162	6041729	60°	5,5	25,6	8,5	5,5	M10x1 60417027	47 5,5	No. 2 60416166	
M10x1 / 60° 60417125	156	60417129	60°	4,2	26,0	8,7	5,5	M10x1 60417027	47 5,5	No. 1 6041626	
M10x1 / 90° 60417025	156	60417028	90°	4,2	26,2	8,7	5,5	M10x1 60417027	47 5,5	No. 1 6041626	
M10x1 / 120° 60417925	162	60416228	120°	4,7	25,4	6,9	4,8	M10x1 60417927	53 4,8	No. 1 6041626	
M10x1.25 / 60° 60417225	162	6041729	60°	5,5	25,6	8,5	5,5	M10x1.25 60417026	36 5,5	No. 2 60416166	
M10x1.25 / 60° 60417115	156	60417129	60°	4,2	26,0	8,7	5,5	M10x1.25 60417026	36 5,5	No. 1 6041626	
M10x1.25 / 90° 60417029	156	60417028	90°	4,2	26,2	8,7	5,5	M10x1.25 60417026	36 5,5	No. 1 6041626	
M10x1 / 60° M10x1.25 / 60° 6041715	202	6041714	60°	5,5	22,6	8,8	8,7	Guiding by the reamer shaft		No. 2 60416166	
M10x1 / 120° M10x1.25 / 120° 60417105	202	60417104	120°	5,5	25,3	8,8	8,7	Guiding by the reamer shaft		No. 2 60416166	
M12x1.25 / 60° 6041615	140	6041618	60°	6,9	24,0	10,5	6,0	M12x1.25 6041617	42 6,0	No. 2 60416166	

NOTES

RECOMMENDED ACCESSORIES

VIDEOSCOPE

9078050

with 1.5 m flexible probe Ø 4.9 mm lenses 0° and 90° viewing angle



UNIVERSAL BROKEN GLOW PLUG TIP REMOVAL

90417900

for M8x1, M9x1, M10x1 & M10x1.25



UNIVERSAL GLOW PLUG HEATING ELEMENT

60417755

Removal Kit



UPGRADE FOR THREAD REPAIR KIT M8X1

60421000-1



UPGRADE FOR THREAD REPAIR KIT M9X1

60421250-1



UPGRADE FOR THREAD REPAIR KIT M10X1

60417000-1



ERGÄNZUNG GEWINDE REP. M10X1,25

60415000-1



HSS TWIST DRILL BIT LONG 5,5 MM

20405500

Precision Ground - Ø 5.5 mm



HSS DRILL BIT LONG VERSION Ø 4.5 MM

20404500

DIN 340, precision ground



THREAD ADAPTER FOR SLIDE HAMMER M10 / M8

6041798

outer M10, inner M8



FLEXIBLE LAMP „BAL“

40103000

410 mm long with protective tube, tip diameter 3.2 mm



FLEXIBLE MAGNET, SIZE 2

52601020

460mm long



EXTRACTION SPINDLE UNF NO.12, M8

60416475 246 mm long



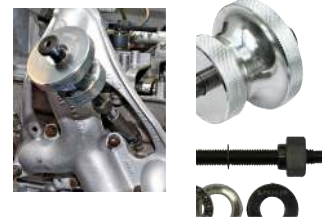
GLOWPLUG HOLE BRUSHES SET

90490300 14 pieces



GLOW PLUG EXTRACTION KIT

60390755 for frozen glow plugs including extractor



GEWINDESPINDEL UNF 1/4" / M8

60416550 278 mm long



SLIDE HAMMER 1350G

60390750 Inner Thread M10, stroke: 45 mm



SLIDE HAMMER 0.7 KG

1030210 Inside Thread M10, stroke: 140 mm



CENTRING AND SUPPORT TUBE (LONG)

60416535 162 mm long



STEP DRILL BIT HSS 9, 5,3 MM FOR M10X1 AND M10X1.15

60418756 TIN coated, shorter version



TOOL HOLDER FOR THE SHOULDERED DRILL

6041876



DRILLING OUT MILLING CUTTER SET

90417960 tool holder and milling cutters for M8, M10 and M12 for broken taps in e.g. glow plugs



SPECIAL DRILL BIT Ø 4,5 MM

6041639 for drilling out the centre electrode of glow plugs M8x1 / M9x1



SPECIAL DRILL BIT Ø 5,5 MM

60417395 for drilling out the centre electrode of glow plugs M10x1 / M10x1,25



TOOL HOLDER FOR DRILL L=90 MM

60416675



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