



GLOW PLUG REMOVAL KIT M10x1 MOD. VAG

Manual

90417410



SAFETY NOTICE

To understand the functioning of the tools, it is 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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Nr.	Part.-Nr.	Description	90417410
1	6049025	Pipe brush cylindrical Ø 5,3mm	1
2	6049029	Pipe brush cylindrical Ø 8,5mm	1
3	1131025	Stud extractor Lift S 2,5mm	1
4	1131035	Stud extractor Lift S 3,5mm	1
5	1131040	Stud bolt extractor Lift S 4,0mm	1
6	60418870	Extractor thread spindle long	2
7	6041738	Tool holder with ratchet	1
8	60417435	Special drill with countersink	1
9	6041667	Holder for special drill	1
10	6041637	Combination holder for tap	1
11	60416533	Support tube for glow plug tool	1
12	60416536	Tension nut M8 compl. 4 pcs.	1
13	6041749	Drill sleeves for fixing	1
14	6041751	Drill sleeves for fixation	1
15	6041641	Drill sleeves for fixation	1
16	4024030	Angle gauge 60° / 90° / 120°	1
17	6041543	Hand tap HSSG	1
18	60418745	Machine tap M10x1	1
19	6041632	Adapter with clamping hole	1
20	6041884	Tap MGB M12x1	1
21	6041798	Impact thread adapter outside M10-inside M8	1
22	6041701E	Reamer for Quickset "G"	1
23	20403500	HSS twist drill long 3,50 mm	1
24	20402600	HSS twist drill long 2,60 mm	1
25	6041704	Insert Setting Tool for M10x1	1
26	6041505	Threaded bush M10 x 1 x 14 mm	4
27	60417129	Glow plug reamer 60°	1
28	60417027	Screw-in guide thread M10x1	1
29	6041626	Actuation length 56.0 mm with hexagonal	1

PREPARATION



Preparation, the glow plugs must be uncovered and all add-on parts which could obstruct the space, e.g. plastic cover, cable harness on the valve cover, injection lines from the rail to the E-nozzle, etc., must be removed: Plastic cover, wiring harness on valve cover, injection lines from rail to E-nozzle, possibly intake manifold, etc. must be dismantled.

1. DETERMINATION OF THE GLOW PLUG BORE AXIS IN THE CYLINDER HEAD

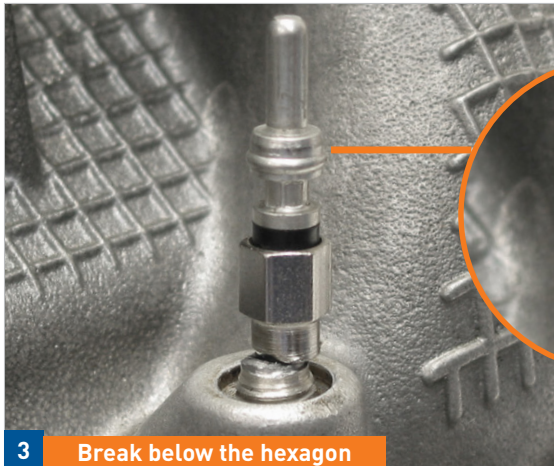
To make it easier to identify the installation position of the glow plug in the cylinder head, it is advisable to remove the next glow plug from the cylinder head and screw in the threaded bushing setter **6041704** (25) instead. The reference point thus obtained here, is very useful and helpful for the „drilling out“ and „tapping“ work steps.



2. REMOVE CENTER ELECTRODE

ELECTRICAL CONNECTION WITH PLUG (PIN)

Place the appropriate stud extractor on the electrical connection (pin) of the glow plug and use a 1/4" ratchet to break off the center electrode by turning it clockwise.



Remove all loose and exposed parts.



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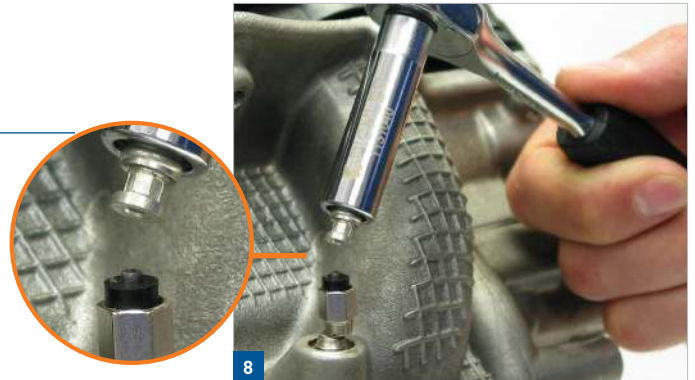


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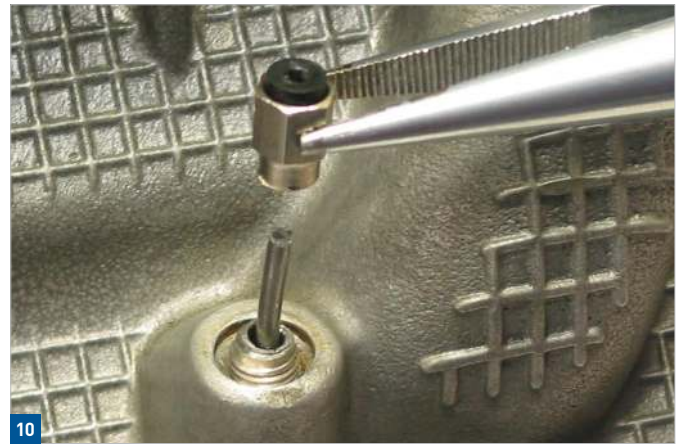
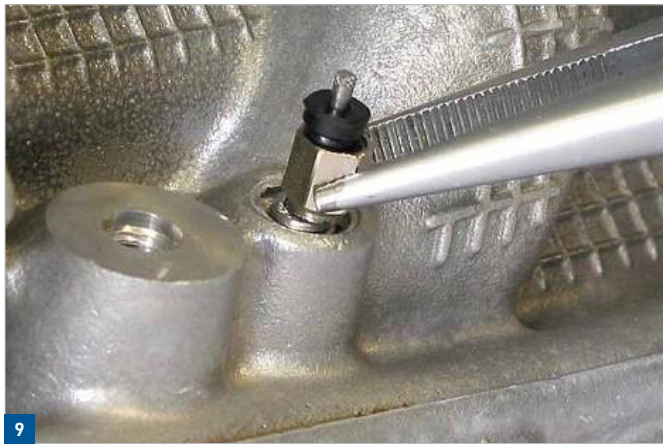


If it is not possible to remove the center electrode from the glow plug by hand, even after turning it a few times, the recommended accessories (set [60390755](#)) can be used (see page 22).

2.1 THE CENTER ELECTRODE BREAKS DIRECTLY BEHIND THE CAP OF THE ELECTRICAL CONNECTION



Remove all loose and exposed parts.



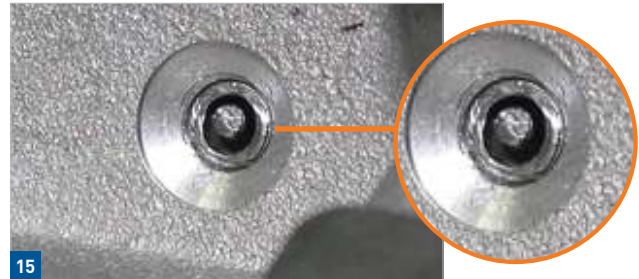
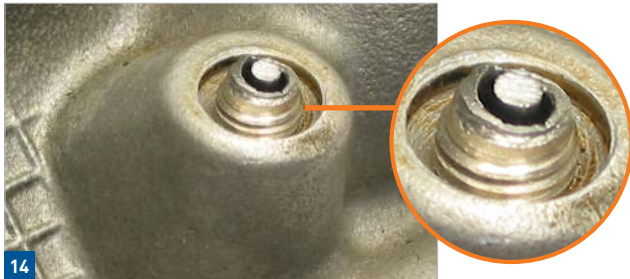
Tap the appropriate stud extractor onto the center electrode and tear it off by turning it clockwise. Then remove all loose and exposed parts.



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2.2 THE CENTER ELECTRODE DOES NOT TEAR OFF AT THE VERY BOTTOM OR POINT 2.1 IS NO LONGER POSSIBLE

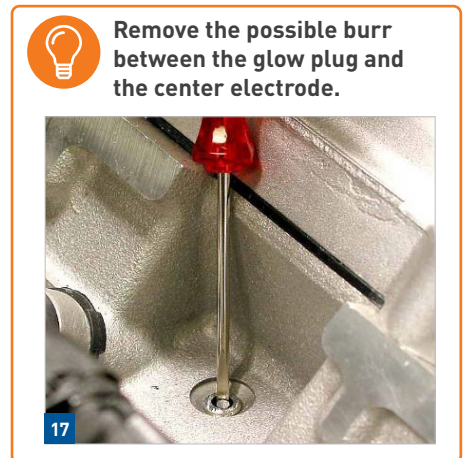
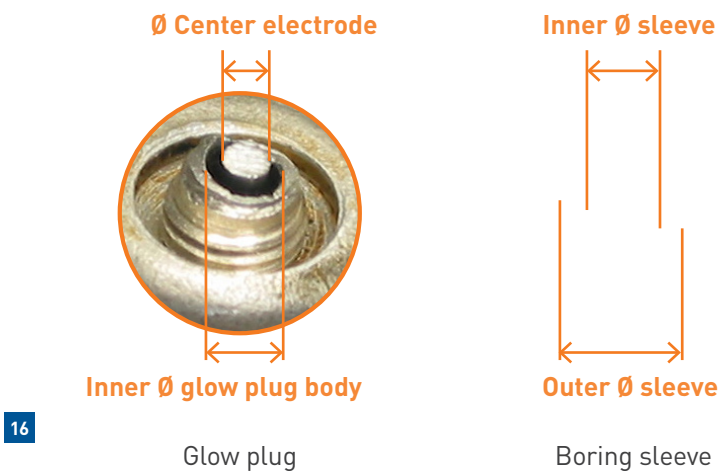
Possible initial situation:



A suitable boring sleeve ($\emptyset$ 2.6 mm **6041641** (15) / $\emptyset$ 2.6 mm **6041751** (14) / $\emptyset$ 3.5 mm **6041749** (13)) must now be selected here:

The suitable boring sleeve must meet the following criteria:

- Inner- $\emptyset$ of the sleeve = outer- $\emptyset$ of the center electrode.
- It must be possible to insert the outer $\emptyset$ of the sleeve into the bore of the glow plug body without play.



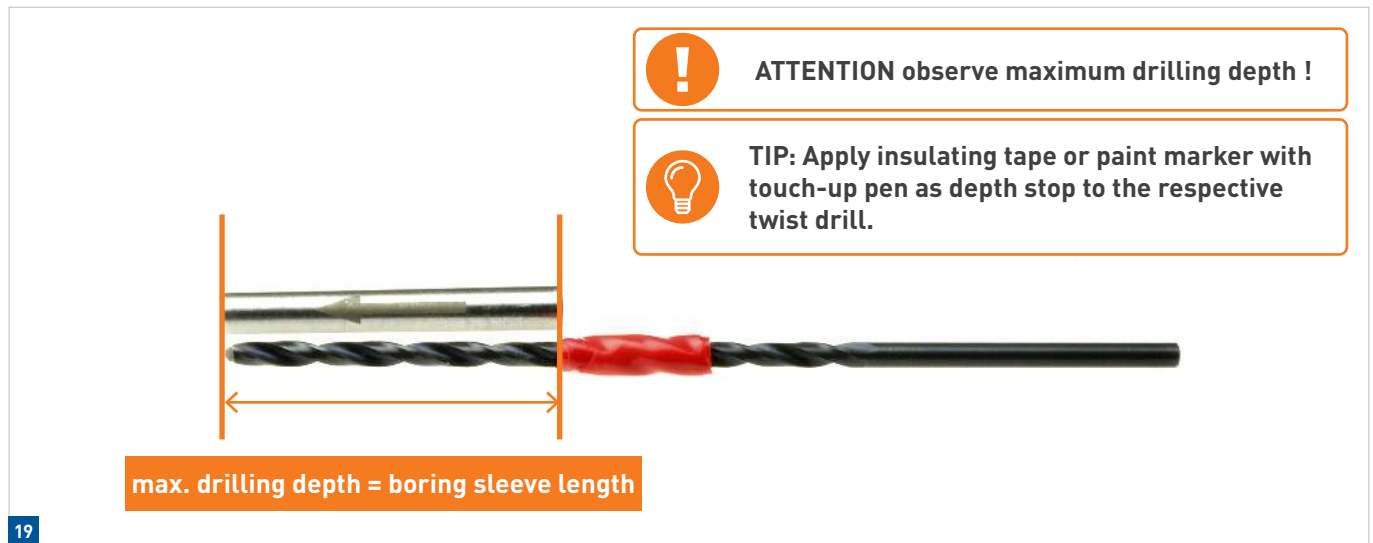
Select the appropriate twist drill:

- Twist drill $\emptyset$ = inner $\emptyset$ of boring sleeve

Inner $\emptyset$ Boring sleeve	Part No. Boring sleeve		Art-Nr. Twist drill
$\emptyset$ 2.6 mm	6041641	→	20402600
$\emptyset$ 3.5 mm	6041749	→	20403500
$\emptyset$ 2.6 mm	6041751	→	20402600



Determine drilling depth:



Place the appropriate drill-out sleeve on the center electrode and drive it halfway into the glow plug.

For tapered drill-out sleeves, the mounting direction (see arrow) must be observed.



TIP: If the boring sleeve falls in very easily, it can be slightly punched on the outer circumference!



Clamp the appropriate twist drill in a drilling machine and drill out the center electrode with feeling and under repeated settling and lubrication up to max. the marking (insulating tape).

Use a suction device, a magnet or compressed air to remove dirt and chips from the drill sleeve.



Lubricate again and again!



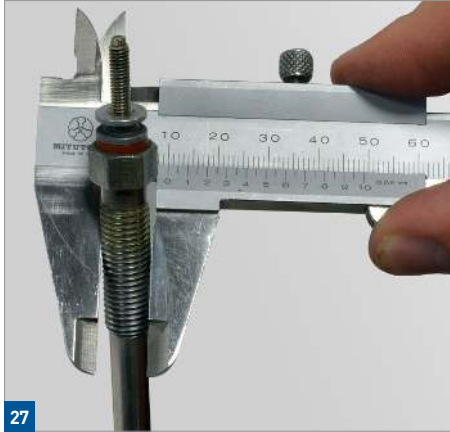
Wearing of protective goggles required

Then remove the boring sleeve from the glow plug again.

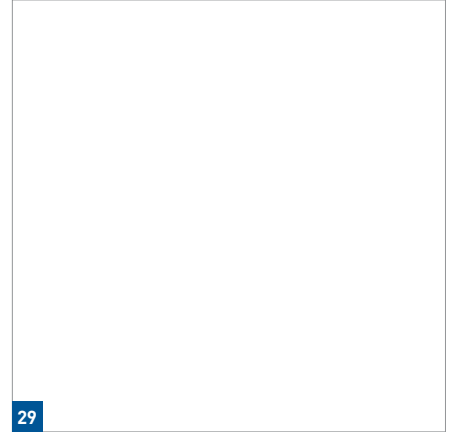


SELECT THE APPROPRIATE SPECIAL STEP DRILL AND DRILL HOLDER

Select the appropriate special step drill and drill holder.



Check glow plug thread size M10x1 and pitch by measurement

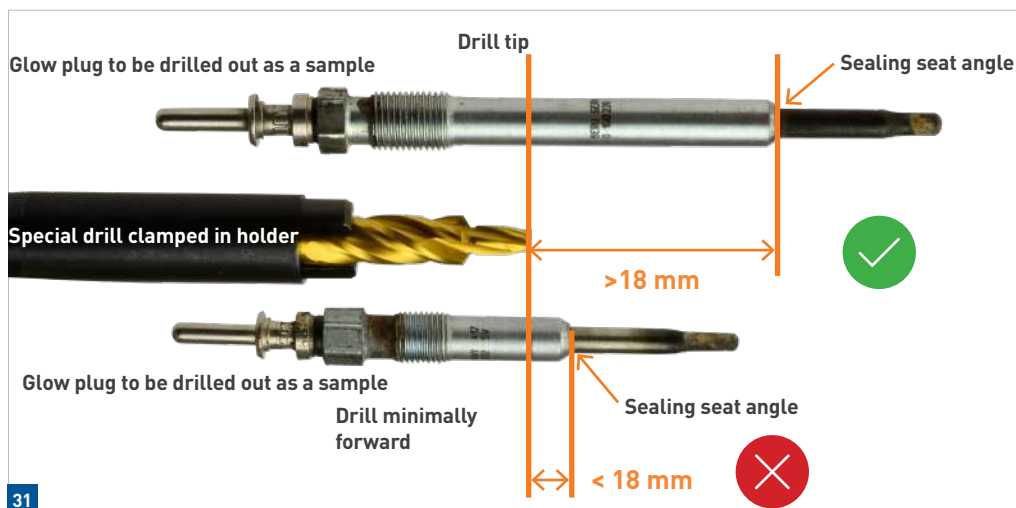


Glow plug thread length = Basically drilling depth to be drilled into the cylinder head

The following criteria must be observed before the boring process:



- The distance from the drill tip to the sealing seat angle of the glow plug must not be less than 18 mm when the glow plug thread is completely drilled out.
- It must be possible to drill the glow plug thread on the glow plug completely free.



In the rare case of an extra short glow plug (dimension less than 18 mm), the **6041876** drill holder would have to be used with the **60418756** special step drill (see recommended accessories, page 23).

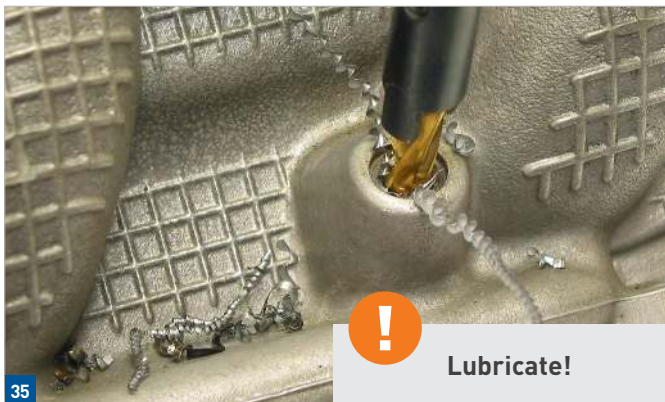


4. CORE DRILLING GLOW PLUG THREAD - PART 1

Chamfer the glow plug by hand with the special step drill **60417435** ⑧ clamped in the drill holder **6041667** ⑨ (3-4 turns)



Then clamp the holder with clamped drill bit in a drilling machine and drill out the glow plug thread 4 -5 mm deep in the core diameter.



Cylinder head with glow plug bore in section



Check the alignment by means of a screwed-in threaded bushing setter.

Use a suction device, a magnet or compressed air to remove dirt and chips from the glow plug.



Wearing of protective goggles required



5. CUTTING EXTRACTION THREAD IN GLOW PLUG - PART 1

Clamp the **UNF 1/4"** **6041543** (17) in the tap holder **6041632** (19) or **6041637** (10) and cut a thread in the glow plug with a suitable actuating tool with feeling, as deep as possible. It is also possible to work with the keeper **6041738** (7).



Check the alignment by means of a screwed-in threaded bushing setter.



Wearing of protective goggles required



Use a suction device, a magnet or compressed air to remove dirt and chips from the glow plug.



6. CORE DRILLING GLOW PLUG THREAD - PART 2

The remaining thread length of the glow plug fastening thread is now drilled out completely in the core diameter, setting it down several times.



IMPORTANT: Re-measuring in the meantime prevents the glow plug from being drilled too deep or too short!



Cylinder head with glow plug bore in section



Use a suction device or a magnet to remove dirt and chips from the glow plug shaft and the glow plug.



Use of drilling and cutting oil recommended. (e.g. Bio-Cut 99900175)



Check the alignment by means of a screwed-in threaded bushing setter.

7. CUTTING EXTRACTION THREAD IN GLOW PLUG - PART 2

Clamp the UNF 1/4" tap 6041543 (17) in the tap holder 6041632 (19) or 6041637 (10) and cut a thread in the glow plug with a suitable actuating tool with feeling, as deep as possible. It is also possible to work with the keeper 6041738 (7).



Check the alignment by means of a screwed-in threaded bushing setter.



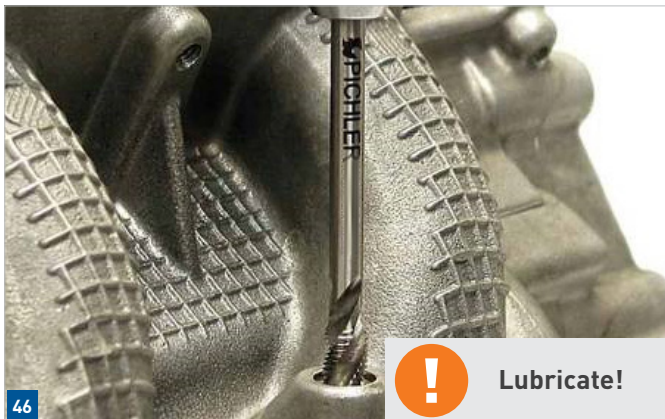
Lubricate!



Wearing of protective goggles required

8. RECUTTING THE FASTENING THREAD IN THE CYLINDER HEAD

Clamp the tap **60418745** (18) in the tap holder **6041632** (19) or **6041637** (10) or in the keeper **6041738** (7), wet it with grease and clean the mounting thread in the cylinder head. Use a suction device, magnet or compressed air to remove dirt and chips from the glow plug shaft and the glow plug. For short glow plugs such as pump nozzle engines, use the **6041874** (not included in the kit).



9. PULLING OUT THE GLOW PLUG

Screw the threaded spindle **UNF 1/4" 60418870** (6) into the glow plug residue and tighten (SW5).



Guide the support tube **60416533** (11) (can be used on both sides, depending on the space available) over the threaded spindle and screw the tension nut **60416536** (12) onto the spindle.



Pull out the glow plug residue by actuating the pull nut with an SW13 wrench and simultaneously holding the hexagon of the threaded spindle with an SW5 wrench.



In the case of very stiff extraction processes (high force required at the tension nut), the actuating nut should be loosened again and again in between (turn back 1-2 turns) and the extraction spindle at the hexagonal end should be bounced with a hammer or knocked back in the direction of the sealing seat!

Furthermore, with adapter **6041798** ②1 impact hammer **60390750** (not included in the kit) can be attached to the pulling spindle and the glow plug residue can be loosened and removed by tapping lightly.



Glow plug rest

9. CLEAN GLOW PLUG SHAFT

First remove soot and deposits from the now uncovered glow plug shaft with the cylindrical tube brush $\varnothing 8,5$ mm 6049029 ② then clean with the cylindrical tube brush $\varnothing 5,3$ mm 6049025 ①.



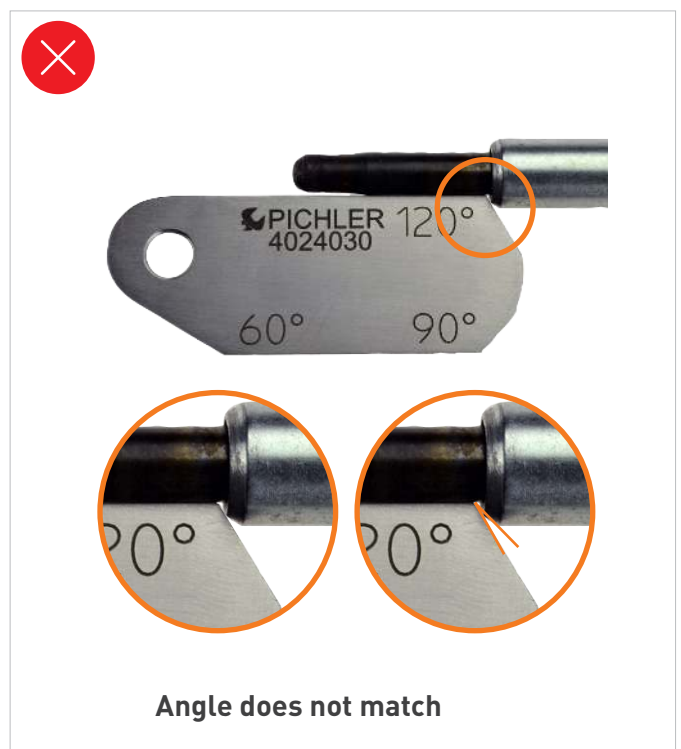
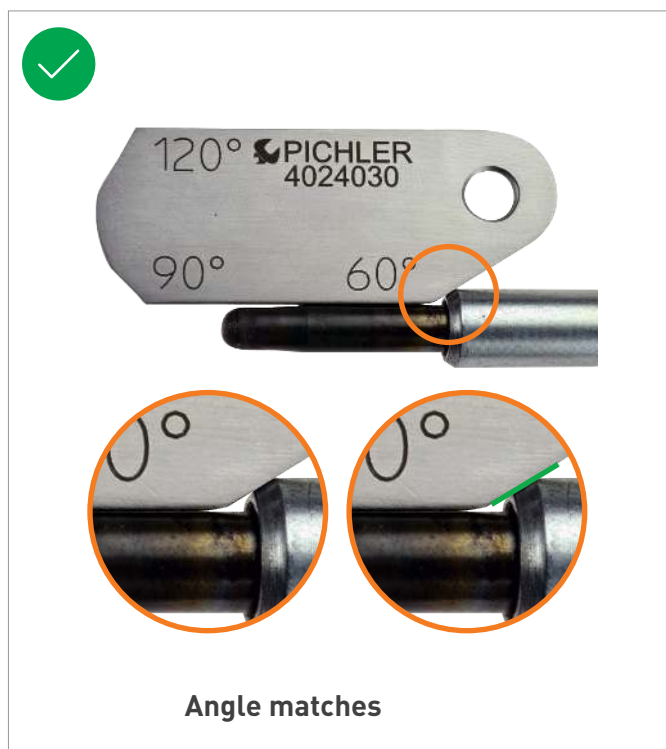
Wearing of protective goggles required



10. CHECKING THE SEALING SEAT ANGLE

Check the sealing angle on the dismantled and cleaned glow plug or on the new glow plug to be installed using the angle gauge 4024030 ①⑥.

The glow plug must have a sealing angle of 60° .



Screw the guide into the glow plug shaft as far as it will go, carefully insert the reamer into the glow plug bore in the cylinder head and hand-tighten the guide with the matching hexagon.



IMPORTANT: Apply some grease to the cutting edge of the reamer to bind the removed material.



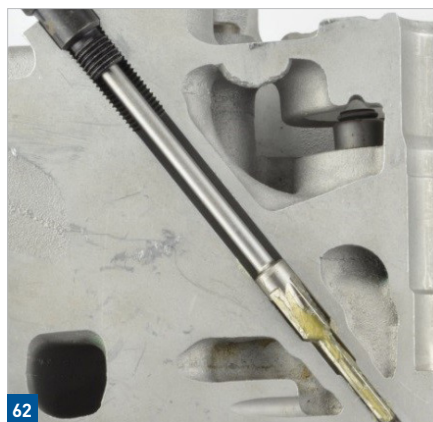
11. FRICTION PROCESS OF THE SEAL SEAT IN THE CYLINDER HEAD

Clean the sealing cone in the cylinder head of soot and slag residues with feeling, turning clockwise only.



IMPORTANT: Turn clockwise only and apply light pressure only!

If space is limited, the actuation can be extended with an extension and an SW10 hexagonal nut.



12. CLEANING AND CHECKING THE SEALING SEAT IN THE CYLINDER HEAD

When cleaning is complete, remove the actuator from the reamer, unscrew the guide with the socket and carefully pull the set-down reamer out of the bore.



Use a suction device, a magnet and/or compressed air to remove dirt and deposits from the glow plug bore in the cylinder head.

Use a visual inspection (**videoscope 9078000** - not included in the set) to check the cleaned glow plug bore in the cylinder head for dirt residues and repeat the cleaning procedure if necessary.



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13. RENEW THE GLOW PLUG FASTENING THREAD M10X1 IN THE CYLINDER HEAD

Prepare glow plug remnant for sealing plug: Shorten the removed glow plug residue at the drilled-out end by approx. 25 mm, recut the UNF 1/4" thread and deburr with a file or emery cloth.

Reinsert the glow plug residue into the cleaned glow plug shaft as a sealing plug.



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Insert the special reamer **6041701E** (22) into the glow plug shaft. Use the special reamer and a suitable actuator to ream the glow plug shaft to a sufficient depth.



Check the alignment by means of a screwed-in threaded bushing setter.



With a suction device, a magnet and/or with compressed air clean the glow plug the glow plug shaft in the cylinder head from dirt and chips from the glow plug shaft in the cylinder head.



Clamp the tap **M12x1 6041884** (20) in the **tap holder 6041632** (19) or **6041637** (10) or in the **keeper 6041738** (7) or cut a thread in the cylinder head with a suitable actuating tool with feeling, as deep as possible.



Check the alignment by means of a screwed-in threaded bushing setter.

Use a suction device, a magnet and/or compressed air to remove dirt and chips from the glow plug shaft in the cylinder head.

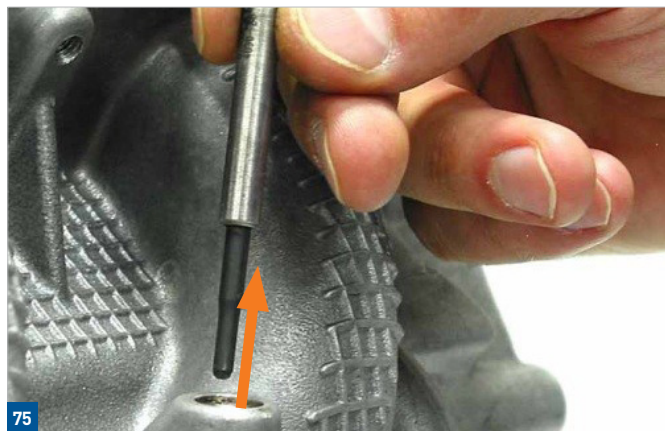


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Wearing of protective goggles required

Remove the sealing plug from the glow plug shaft again using a magnet or the extraction spindle.



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A threaded bushing **M10x1 6041505** (26) is screwed onto the threaded bushing setter **M10x1 6041704** (25).



76

Wet with a threadlocker.



77

Use the M10x1 threaded bushing setter to set the M10x1 threaded bushing.



78

Remove the M10x1 threaded bushing setter and install the new glow plug to the specified torque.



79

After the screw lock has cured (see manufacturer's instructions), the new glow plug can be fitted.

RECOMMENDED ACCESSORIES

VIDEOSCOPE MOD. EXCL. WITH 1.5 M LONG FLEXIBLE CONDUCTOR SHAFT

9078050



UNIVERSAL BROKEN GLOW PLUG TIP REMOVAL SET

90417900



UNIVERSAL GLOW PLUG HEATING ELEMENT REMOVAL KIT

60417755



THREAD ADAPTER FOR SLIDE HAMMER M10 / M8

6041798



DRILLING OUT MILLING CUTTER SET

90417960



MAGNETIC PICK UP TOOL SIZE 2

52601020



GLOWPLUG HOLE BRUSHES SET 14 PCS.

90490300



GLOW PLUG EXTRACTION KIT

60390755



STEP DRILL BIT HSS 9, 5,3 MM FOR M10X1

60418756



SLIDE HAMMER 1,35 KG

60390750



TOOL HOLDER FOR THE SHOULDERED DRILL

6041876





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