



MANUAL

INJECTOR REMOVAL SET

M9R/M9T/R9M

60382095 & 60382190

SUPPLEMENTARY KITS 60382105 | 60382115 | 60382120 | 60382125 | 60382135
60382200



SAFETY NOTICE

**To understand the functioning of the tools,
is it necessary to read the manual in advance!**

- Read these instructions before assembling, during installation and throughout use and in the proper sequence.
- The use of the tools should only be carried out by qualified personnel!
- 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 shown are meant to serve as aides only and are by no means a guarantee for certain results. In some cases, due to insufficient space the engine or the cylinder head will need to be removed.
- 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.



ATTENTION
Special caution



CORRECT



LIGHT BULB
Hint or recommendation



FALSE



SAFETY GLASSES
Wearing safety glasses necessary

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EXTRACTION OF A PIEZO CONTROLLED INJECTOR WITH A DAMAGED OR TORN OFF DIESEL LINE CONNECTING THREAD **16**



**For all cases A to C
must the procedure be finished according the initial results:**

1. PIEZO OR SOLENOID CONTROLLED INJECTOR IS TORN IN THE CENTRAL SECTION AND THE SLEEVE IS STILL STUCK IN THE CYLINDER HEAD.	18
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INJECTOR REMOVAL SET M9R/M9T/R9M

60382095 & 60382190

SUPPLEMENTARY KITS 60382115 | 60382120 | 60382125 | 60382135 | 60382200



Nr.	Part-nr.	Description	60382095	60382105	60382115	60382120	60382125
①	60382222	Inner Support Leg	2	2	2	2	2
②	60382220	Support Bridge Complete 3 pcs.	1	1	1	1	1
③	60382221	Support Leg for 4th cylinder	1	1	1	1	1
④	60382224	Outer Support Leg	4	4	4	4	4
⑤	60390102	Sealing Plugs 10mm for 60390100	4	4	-	-	-
⑥	60390081	Setting Tool For Sealing Plugs	1	1	-	-	-
⑦	60385218-1	Brass Straddling Dowel M5	4	4	-	-	4
⑧	60385217	Pull Rod for Straddling Dowel	1	1	-	-	1
⑨	151.20425	Hexagon Key 2,5mm	1	1	-	-	-
⑩	90417911	Cutting Oil 25 ml in a Dropping Bottle	1	1	1	1	1
⑪	60382331	Centering Guide	1	1	1	1	1
⑫	60382430	Extra Pins for Double Pin Wrench PU 20 pcs.	1	1	-	-	-
⑬	60382217	Magnetic Attachment with Adapter M5 Pull 6kg	1	1	1	1	1
⑭	60382155	Shank for Air Impact Hammer	1	1	1	1	1
⑮	60382425	Double Pin Wrench	1	1	-	-	-
⑯	60382235	Box Nut Adaptor	1	1	1	1	1
⑰	60382343	Extraction Adapter Internal Thread M14x1,5 : External Thread M20x1	1	1	1	1	1
⑱	60382230	Open Screw	1	1	1	1	1
⑲	6038311	Hydraulic Hollow Plunger Cylinder 20 ton	1	-	1	-	-
⑳	60385342	Swivel Cup Collar	1	1	1	1	-
㉑	60385338	Tap M18x1.5mm	1	1	-	-	-
㉒	60385339	Tap M16x1.5mm	1	1	-	-	-
㉓	60385333	Tap Holder	1	1	-	-	-
㉔	60385349	Extraction Spindle M20x1,5 / M18x1,5	1	1	1	1	-
㉕	60385347	Extraction Spindle M16x1.5 / M20x1.5	1	1	1	1	-
㉖	7903080	Allen Socket 8x100	1	1	1	1	1
㉗	60385341	Swivel Cup	1	1	1	1	-
㉘	60385318	Extraction Adapter M20x1.5	1	1	1	-	-
㉙	60385316	Extension Nut M20x1.5	1	1	1	1	-
㉚	9130032	Stud Remover „TWIST SOCKET“	1	1	-	-	-
㉛	60384172	Allen Socket 10 with Hole	1	1	-	-	-
㉜	58506050	Hole Saw Arbour Hex 9.2	1	1	1	-	-
㉝	60383317	Tap M17x1	1	1	1	-	-
㉞	60385312	Drill Guide	1	1	1	-	-
㉟	60385308	Spiral Drill 8,5 mm	1	1	1	-	-
㊱	60385334	Spiral Drill 8,5 mm with Mark	1	1	1	-	-
㊲	60385301	Machine Tap M10	1	1	1	-	-
㊳	58506020	Hole Saw Arbour Hex 5,7	1	1	1	-	-
㊴	60385314	Extraction Adapter External Thread M17x1 / Internal Thread M18x1,5	1	1	1	-	-
㊵	60384417	Adapter With Internal and External Thread	1	1	-	-	-
㊶	60385313	Box Nut Adaptor	1	1	1	-	-
㊷	60385317	Hexagon Socket Screw M10 x 75 mm	1	1	1	-	-
㊸	60385321	Extraction Spindle M20x1.5x160mm	1	1	1	-	-

M9R/ M9T / R9M-INJECTOR EXTRACTION SUPPLEMENTARY KIT

60382190



Nr.	Part-nr.	Description	60382190	60382200
			pcs	pcs
①	9039034	Flexible bit holder 1/4"	1	-
②	60385201	Tap M20x1,5	1	1
③	60385202	Tool Holder for Tap	1	1
④	9039036	Holder for tube brushes	1	-
⑤	60382249	Extraction Spindle M20x1,5	1	1
⑥	60382204	Hole Saw Arbour	1	1
⑦	9039027	Tube Brush Ø26mm	2	-
⑧	30301912	Hole Saw	4	4
⑨	60385203	Guide for Hole Saw	1	1

A

EXTRACTION OF A PIEZO CONTROLLED BOSCH INJECTOR

Remove, in preparation, all attachments which are in the way such as: plastic engine cover, wiring harness at the valve cover, fuel injection lines from the rail, air filter housing, circulating air box, etc.



Close all resulting openings with either plugs, a piece of cloth or something similar.

A.1 Remove the plastic connector of the injector with a chisel or screwdriver.



A.2 Slide on the Open Screw **60382230** onto the flat areas of the injector.



A.3 Screw Adapter **60382343** on the inlet connector of the injector and tighten it. (approx. 70Nm / hexagon 8mm)



A.4 Screw the Box Nut Adaptor **60382235** on to Open Screw **60382230**. (100 – 130Nm / Hexagon 30mm)



A.5 Screw the Extension Nut **60385316** on to the Extraction Adapter **60382343** and tighten it lightly. hex 27



A.6 Screw the Extraction Spindle **60385321** in the Extension Nut **60385316** and tighten it. hex 10



... continue with point 5 on page 35

B

EXTRACTION OF A SOLENOID CONTROLLED BOSCH INJECTOR

Remove, in preparation, all attachments which are in the way such as: plastic engine cover, wiring harness at the valve cover, fuel injection lines from the rail, air filter housing, circulating air box, etc.



Close all resulting openings with either plugs, a piece of cloth or something similar.

B.1 Remove the solenoid with a spanner, open socket 29mm **6038422** (Not included in the set) or multigrip pliers. **hex 29**



B.2 When removing the solenoid, loose parts such as springs, washers and others may fall out!
Remove the loose small parts with a magnet.



B.3 Push the three leaf down with a screwdriver, remove the locking ring with a magnet and remove the three leaf and spring.



B.4 Unscrew the screw with the Allen Socket **60384172**.

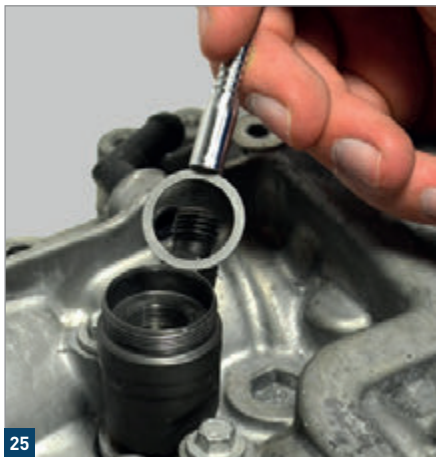


B.5 Unscrew the diesel line connector from the injector and remove the sealing ring. **hex13**



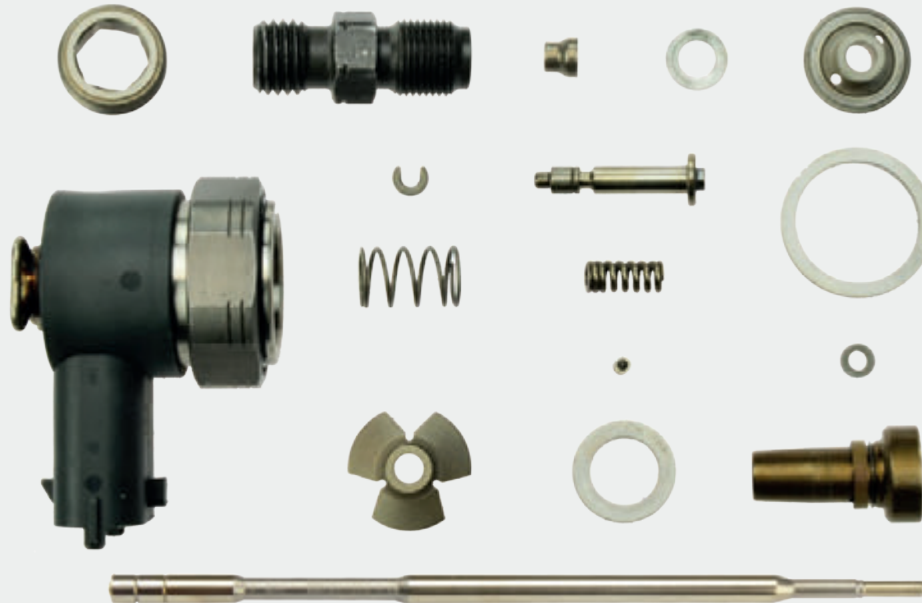
B.6 Remove the spacer with a magnet. **Picture 25**

Lift and remove the nozzle needle by blowing with compressed air in the small bore on the side. At the same time lightly tap the injector with a hammer to support this.





Overview of the removed parts



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B.7 Insert Tap M17x1 **60383317** in the Hole Saw Arbour **58506050**, moisten the Tap with Cutting Oil **90417911** and tap as deeply as possible into the injector with an actuating tool. **hex13**
 This way is also thread M17x1 cut on the small step. (see picture 31)



ATTENTION: Lubricate the Tap and repeatedly break the chips.



29



30



31



32

B.8 Remove the swarf e.g. with the magnet **52601020** Ø 8 mm (not included in the set) or suction device **80636500** (not included in the set).

Screw the Drill Guide **60385312** in the injector and tighten it lightly. **hex 24**



B.9 Clamp the Spiral Drill Ø8.5mm **60385308** in a drill, wet it and insert it in the Drill Guide **60385312**. Drill carefully, and with repeatedly lifting, so deep into the injector until a noticeable resistance is felt, or the chuck of the drill touches the Drill Guide **60385312**.



Pull the drill at regular intervals far enough out of the drill guide to remove the swarf from the hole.



B.10 Remove the swarf e.g. with the magnet **52601020** Ø 8 mm (not included in the set) or suction device **80636500** (not included in the set).



B.11 Replace the Spiral Drill **60385308** by the longer Spiral Drill with Mark **60385334**. Carefully continue to drill into the injector until the mark on the Spiral Drill is flush with the top of the Drill Guide.



Pull the drill at regular intervals far enough out of the drill guide to remove the swarf from the hole. See picture 38



Attention:

If the spiral drill was reground, the correct drilling depth is no longer consistent with the marking.

The hole is deep enough when there was drilled at least 110 mm deep, measured from the top of the drill guide.



B.12 Unscrew the Drill Guide **60385312** from the injector and remove the swarf e.g. with the magnet **52601020** \varnothing 8 mm (not included in the set) or suction device **80636500** (not included in the set).





B.13 Clamp the Tap M10 **60385301** in the adapter **58506020** wet the tap with cutting oil **90417911** and cut, as deep as possible, thread in the injector.



ATTENTION: Don't forget to lubricate and to break the chips.



It is recommended to interrupt again and again the cutting to prevent a swarf build-up.

Unscrew the Tap completely from the hole and remove the swarf e.g. with the magnet **52601020** Ø8mm (not included in the set) and continue the tapping until the maximum depth is reached.



B.14 To check whether the M10 thread has been cut deep enough, screw the Hexagon Socket Screw M10x75 **60385317** all the way in the thread. If the distance between the areas marked in red is less than 21mm is the thread cut deep enough. **(see the picture 46)**

Should the distance exceed 21mm, repeat the procedure from step **B.13**.

Remove the Hexagon Socket Screw M10x75 **60385317**.



B.15 Screw the Extraction Adapter **60385314** in the injector and tighten it. **hex24 / approx. 70Nm**



B.16 Insert the Allen Screw M10x75 **60385317** in the Pull Adapter **60385314** and tighten the Screw with the Hex Bit Socket 8 **7903080** at approx. 80 Nm



B. 17 Screw the Screw-On Sleeve **60384417** all the way on the thread for the solenoid valve and tighten it lightly. **hex32**



B. 18 Screw the Box Nut Adaptor **60384313** on the Screw-On Sleeve **60384417** and tighten it. **hex 32 / approx. 90Nm**. Screw the Extraction Spindle M20x1.5 **60385321** in the Extraction Adapter **60385314** and tighten it lightly. **hex10**



... continue with point 5 on page 35

C

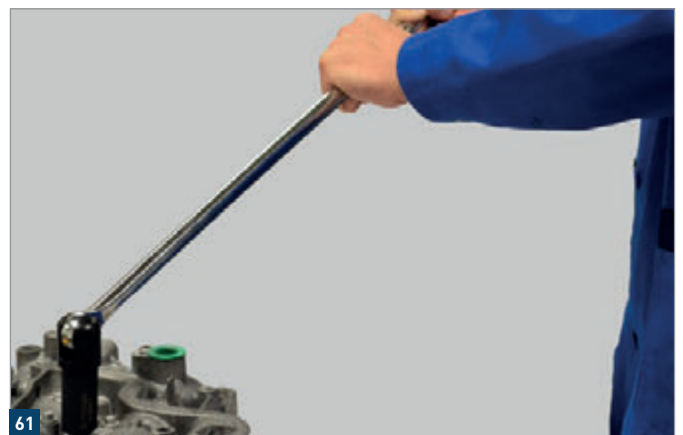
EXTRACTION OF A PIEZO CONTROLLED INJECTOR WITH A DAMAGED OR TORN OFF DIESEL LINE CONNECTING THREAD



C. 1 Hammer the Twist Socket **9130032** firmly on the protruding part of the injector



C. 2 Try to unscrew the injector anticlockwise using a lever with square 1/2" e.g. **7560010 + 75005160** (not included in the set)



ATTENTION: If during unscrewing the injector very much effort is needed can this lead to twisting or breaking of the injector. To avoid this continue on [page 7 with point A.2](#)



In this case must adapter **60382343** be welded to the injector. (wear safety goggles)

1. THE INJECTOR IS TORN OFF AND INJECTOR SHEATH IS STUCK IN THE CYLINDER HEAD

Supplementary Kit 603852005/ 60385200 necessary!



1.1 Measure the extracted part of the injector, see picture 66.

E.g.: piezo controlled injector



The measuring points are identical on a solenoid controlled injector.

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1.2. Remove with a magnet, the loose small parts from the injector shaft.



1.3 Insert the Pipe Brush **9039027** as far as possible in the Brush Holder **9039036** and fix it with two spanners 13 & 14.



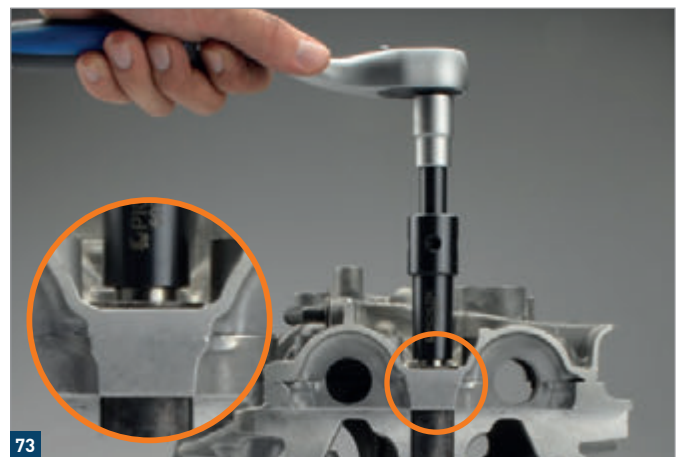
1.4 Clamp the Flexible Shaft **9039034** with the Brush Holder **9039036** and Pipe Brush **9039027** in a drill. Clean the stuck sheath and remove debris using a suction device or compressed air.



ATTENTION: only turn clockwise!



1.5 Clamp the Tap **60385201** in the Holder **60385202** lubricate the Tap and cut thread in the sheath.



Cross section of the cylinder head



1.6 Remove the swarf using a magnet and clean the cut thread with a suction device or compressed air.



1.7 Screw the Spindle **60382249** into the threaded sleeve and screw extension nut **60385316** onto the spindle.



1.8 Screw the Pull Spindle M20x1.5 **60385321** into the extension nut **60385316** and tighten it slightly with an actuating tool 10.



For repeating the pull process **step 6, page 37**.

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If successful continue with point 1.9



1.9 IMPORTANT: Work can only be continued (with point 1.11), after the snap ring is removed from the injector shaft!



80

Retainer ring is not in the sleeve

...continue with point 1.10



81

Retainer ring is still in the sleeve

... continue with point 1.11

1.10 If the snap ring is not removed together with the sheath from the injector shaft, than remove it e.g. with a magnet or a pair of pliers.



82



83

Cross section of the cylinder head



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1.11 Clean the injector shaft until the Guide for Hole Saw **60385203** can be inserted. Remove debris using a suction device or compressed air.



85



ATTENTION: only turn clockwise!

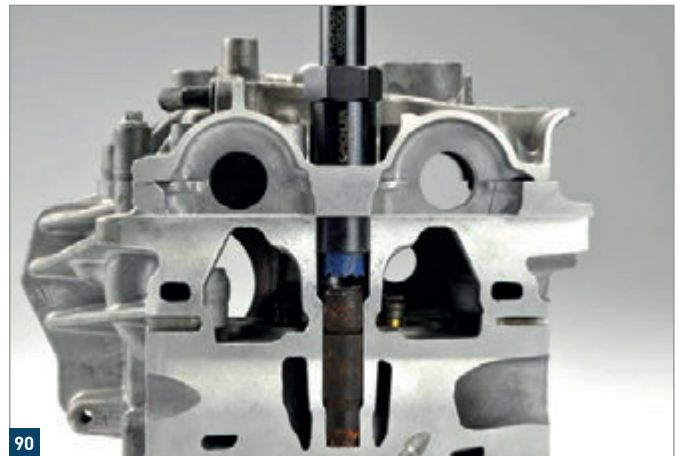
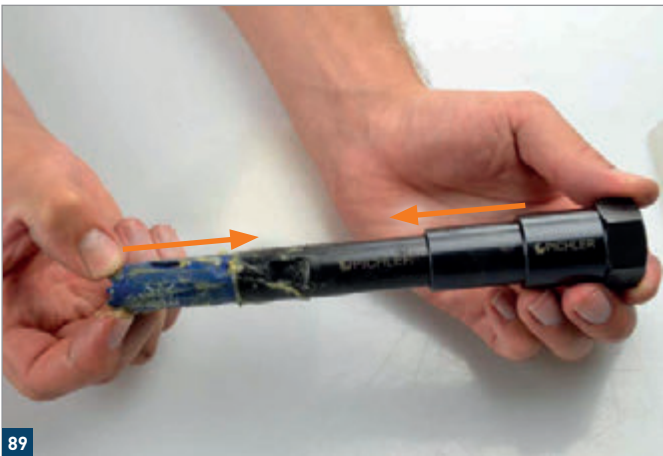


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1.12 Screw the Hole Saw **30301912** onto the Hole Saw Arbour **60382204** and tighten it with spanners 15 & 17. Lubricate (with cutting oil or the like) the Arbour and the Hole Saw.



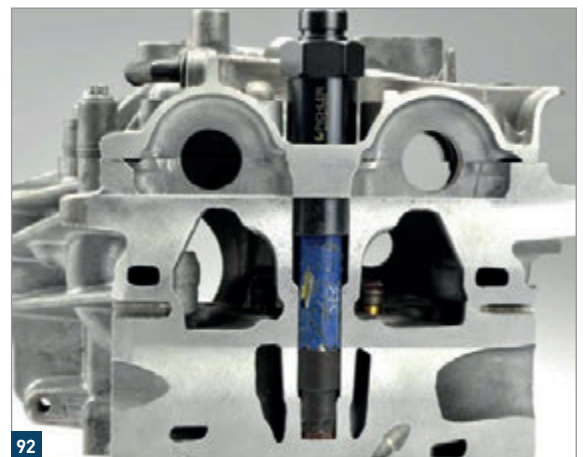
1.13 Slide the Hole Saw Arbour **60382204** with Mounted Hole Saw **30301912** as in picture 89, through the Guide **60385203** and place the assembly in the injector shaft.



1.14 Clamp the Hole Saw Arbour **60382204** in a drill machine and begin to drill out the injector sleeve clockwise. There has been drilled sufficiently deep, when the specified distance (see figure 91) has been reached.

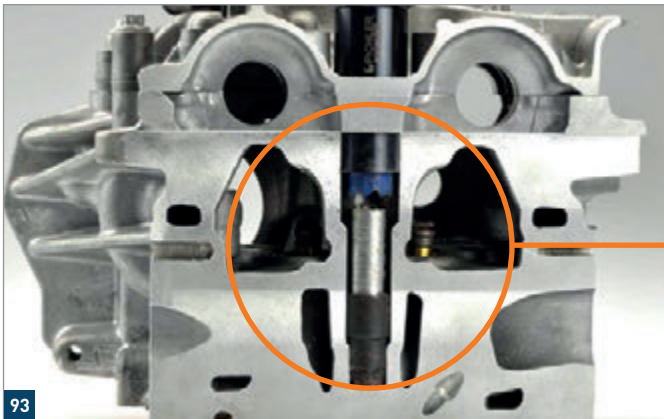


Piezo = ca. 24 mm
Magnet = ca. 9 mm





IMPORTANT: Remove the hole saw again and again and clean and relubricate the combination.

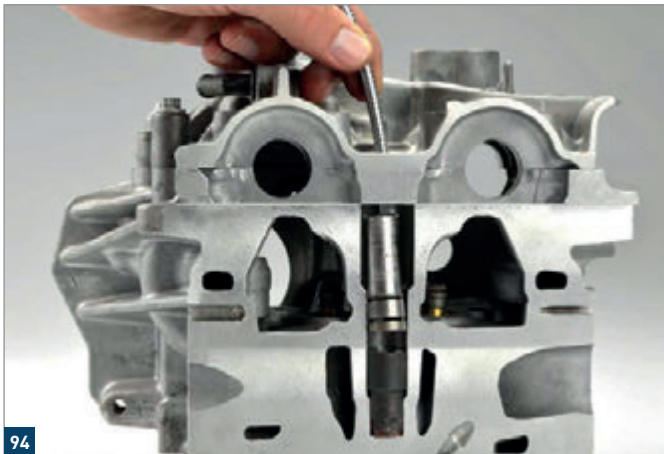


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Cross section of the cylinder head



1.15 Remove with a magnet, pliers or other suitable tool, the swarf and loose parts.



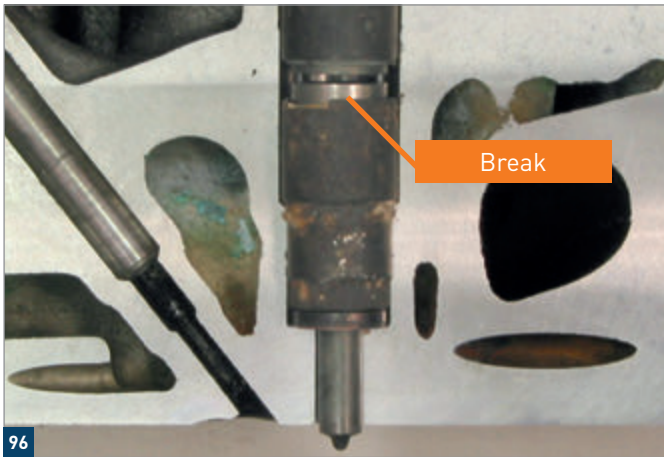
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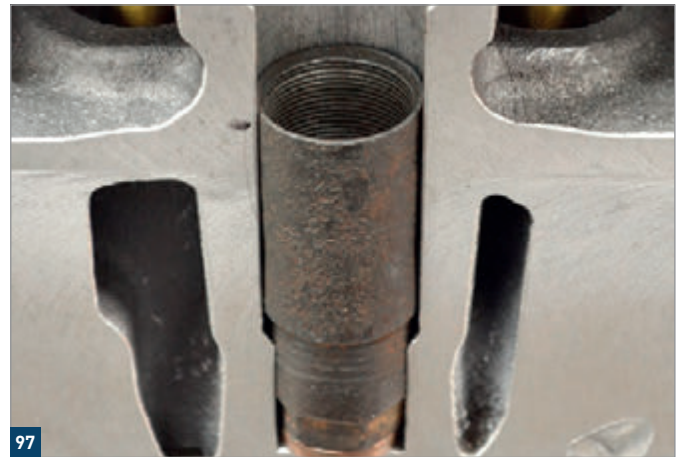
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... continue with point 2 on page 24

2. PIEZO OR SOLENOID CONTROLLED BOSCH INJECTOR HAS BEEN TORN OFF IN THE LOWER PART OR IS UNSCREWED.



Injector torn off



Injector unscrewed

2.1 Remove the remaining parts (e.g. with a magnet) from the shaft.



2.2 Spray a little rust dissolver e.g. rust remover **9990020** (not included in the set) in the injector shaft and let it soak for a while.



2.3 Place the Shank for Air Impact Hammer **60382155** together with the Centring Cone **60382331** in the injector shaft. Release with an air impact hammer and suitable attachment e.g. **80257000** (not included in the set) the nozzle body.



ATTENTION: The release of the nozzle needle body should be done primarily by the vibrations and only secondarily by the torque applied by the Double Pin Wrench!

2.4 Determine which nozzle body is in the injector.



e.g. with help of the light
40103000
(not included in the set)



If the needle body matches **TYPE A:**
Use **A-end** of the pin wrench
60382425



If the needle body matches **TYPE B:**
Use **B-end** of the pin wrench
60382425



2.5 Slide the Centering Guide **60382331** over the Double Pin Wrench **60382425** and insert them with the right side down into the injector shaft.



2.6 Stick the pins of the Double Pin Wrench **60382425** in the holes of the nozzle body and with an tool with **hex14 (TYPE A)** or **hex15 (TYPE B)**, release the nozzle body by gently turning left & right, with **max. 20 Nm**.



If the nozzle needle body cannot be released with the Double Pin Wrench, the procedure must be repeated from **point E.4 on page 27**.

2.7 Remove the nozzle body with the Magnetic Attachment **60382217**.

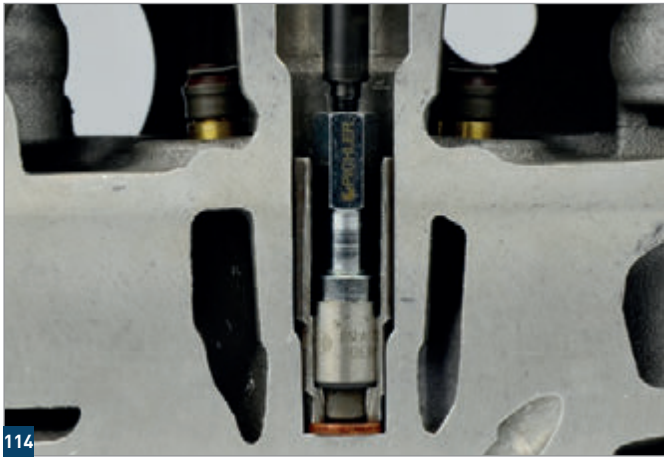
Screw the Magnetic Attachmen **60382217** onto the Pull Rod **60385217** until it stops and tighten it by hand.



TIP: The nozzle needle body of a piezo-controlled injector can also be pulled out by means of a straddling dowel. **60385218**

This has the advantage of a higher holding force. **...continue with point 2.9 on page 27**

2.8 Remove the released needle body from the shaft with the magnet tool **60382217**.



... continue with point 2.12 on page 28

2.9 Remove the needle from the needle body with a magnet.

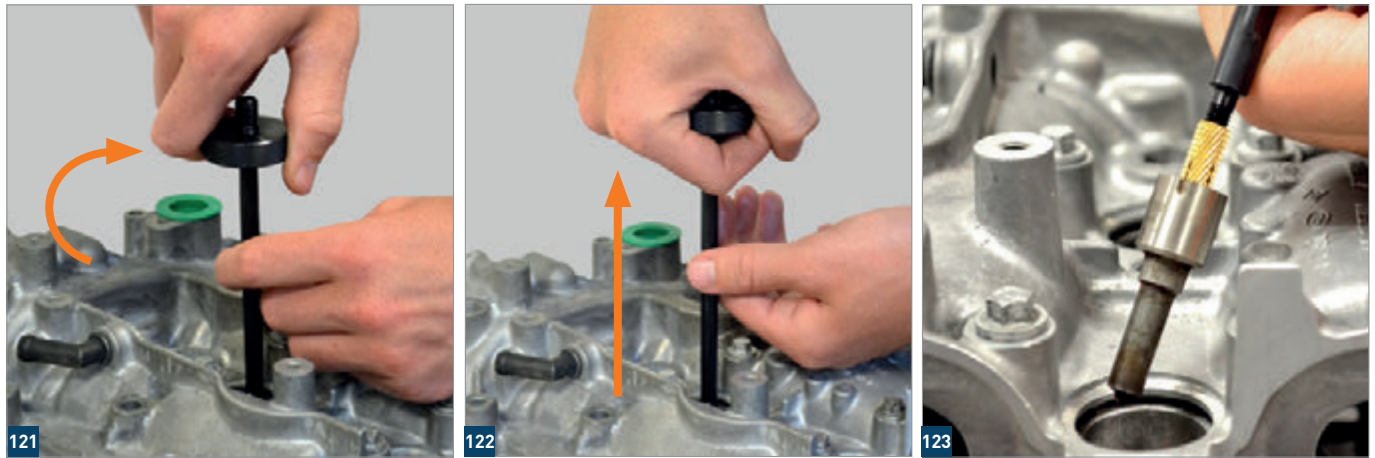


2.10 Screw the straddling dowel **60385218-1** loosely on the pull rod **60385217**. Insert the Pull Rod with the screwed on Straddling Dowel in the injector shaft and push it into the needle body.

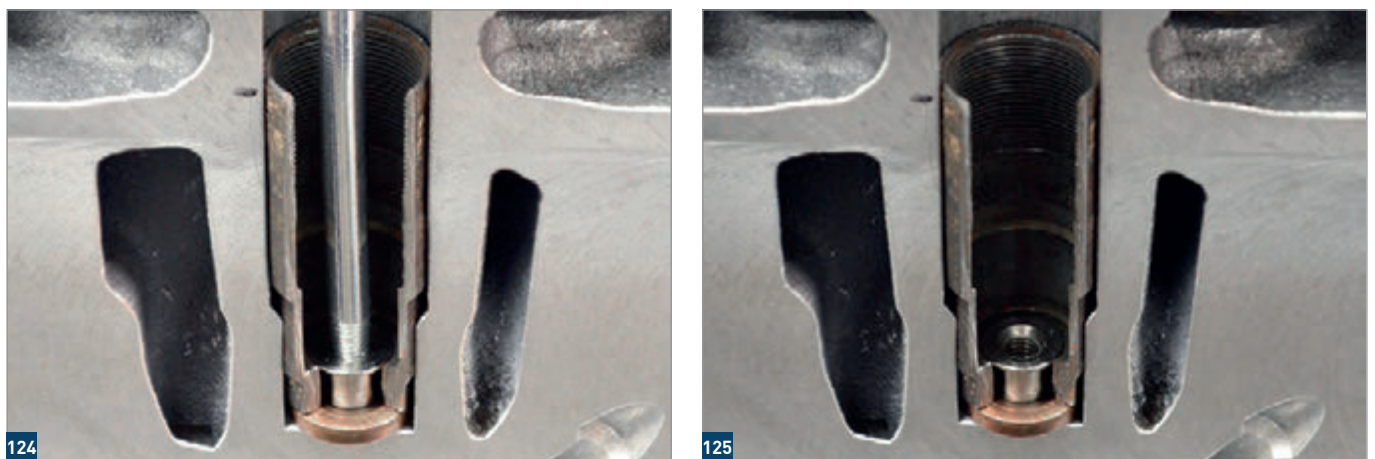


THE DOWEL MAY NOT EXPAND!

2.11 Turn the thumbwheel on the end of the Pull Rod, so that the Straddling Dowel spreads open. Draw the needle body from the injector shaft.



2.12 Screw a Sealing Plug **60390102** on the Setting Tool **60390081** and close the hole to the combustion chamber.



3. REMOVING THE INJECTOR SLEEVE Ø 19 MM OF PIEZO OR SOLENOID CONTROLLED INJET RS

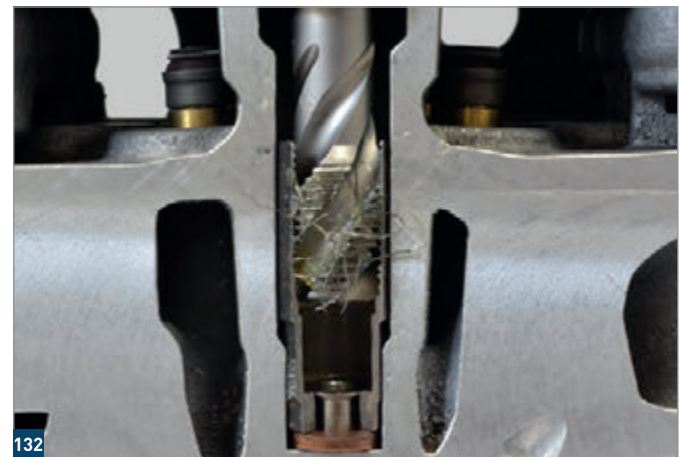
3.1 Clamp the Tap M18x1.5 **60385338** in the Tap Holder **60385333** using Hex Key **151.20425**. hex2.5



3.2 Slide the Centering Guide **60382331** on to the Tap Holder **60385333** wet the Tap M18x1.5 **60385338** with cutting oil **90417911** and insert it in the injector shaft.



3.3 Cut with a suitable tool M18x1.5 thread in the still stuck sleeve. **hex13**
Cut the thread over the full length of the injector sleeve and repeatedly break the chips.



It is recommended after cutting thread in the sleeve, to remove the chips and to repeat the cutting.



ATTENTION: The Sealing Plug must not be removed along.



3.4 Screw the Extraction Spindle M18x1.5 to M20x1.5 **60385349** in the previously cut thread and tighten it. **hex10**



3.5 Screw the Extension Nut **60385316** on the Extraction Spindle **60385349** and tighten it lightly. **hex27**



3.6 Screw the Extraction Spindle M20x1.5 **60385321** in the Extension Nut **60385316** and tighten it lightly. **hex10**



3.7 Repeat the pulling process from **point 6 page 37**.



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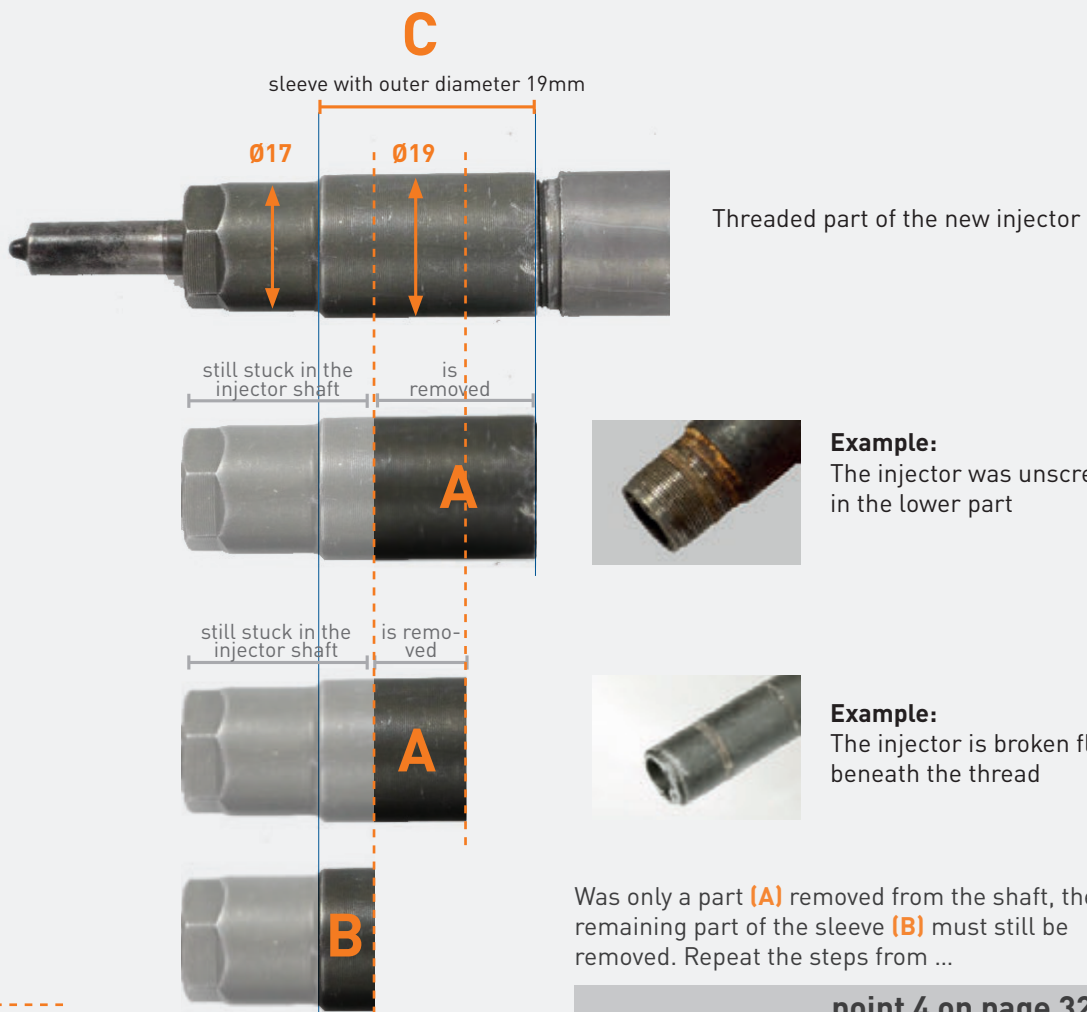


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... continue with point 3.8



3.8 CONTROL: First must be determined, how much of the lower threaded sleeve is still stuck in the injector shaft. This can be found out by comparing the removed part with a new injector. If a rest of the larger diameter (19mm) is still stuck in the injector shaft, repeat the steps from „broken injector“ (3.2 - 3.7.)



possible points of breakage

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4. REMOVING THE SLEEVE REST WITH OUTER DIAMETER 17MM OF PIEZO OR SOLENOID CONTROLLED INJECTORS

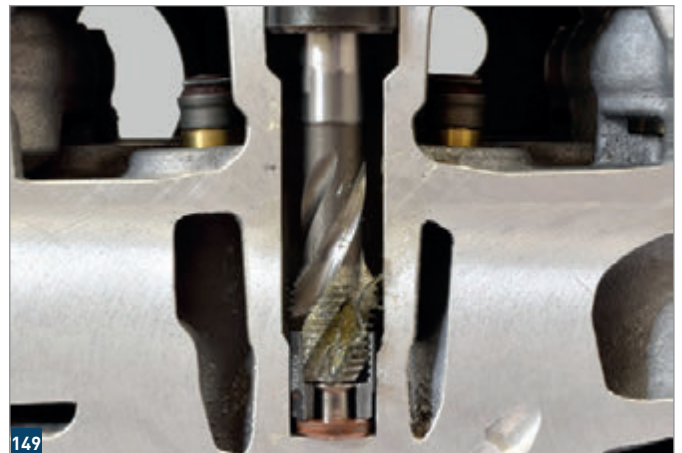
4.1 Clamp the Tap M16x1.5 **60385339** in the Tap Holder **60385333** with Hex Key **151.20425**. hex2.5



4.2 Slide the Centering Guide **60382331** on to the Tap Holder **60385333** wet the Tap M16x1.5 **60385339** with grease or cutting oil **90417911**.

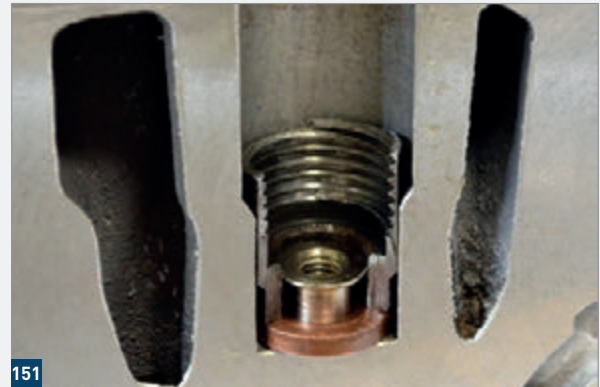


4.3 Cut with a suitable tool M16x1.5 thread in the stuck sleeve. hex13





It is recommended after cutting thread in the sleeve, to remove the chips and to repeat the cutting.



4.4 Screw the Pull Spindle M16x1.5 to M20x1.5 **60385347** in the previously tapped thread to the stop and tighten it with a spanner 10.

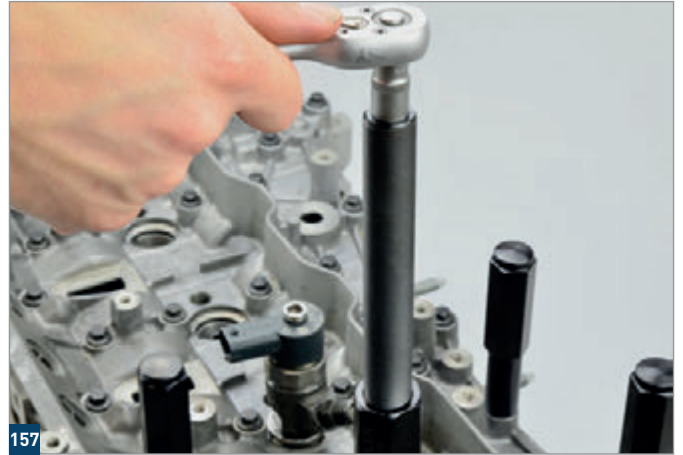


4.5 Screw the Extension Nut **60385316** on the Extraction Spindle M16x1.5 to M20x1.5 **60385347** and tighten it lightly. **hex27**





4.6 Screw the Extraction Spindle M20x1.5 **60385321** into the Extension Nut **60385316** and tighten it lightly. **hex10**



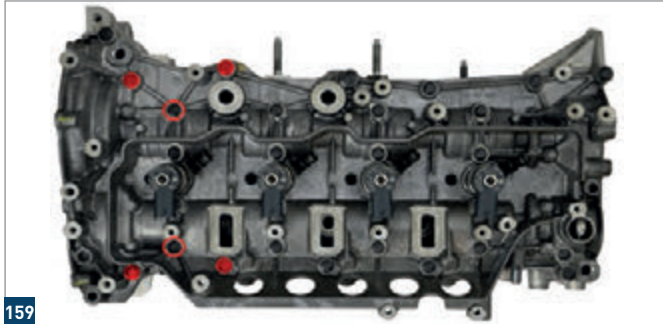
continue with pulling process point 6 page 37



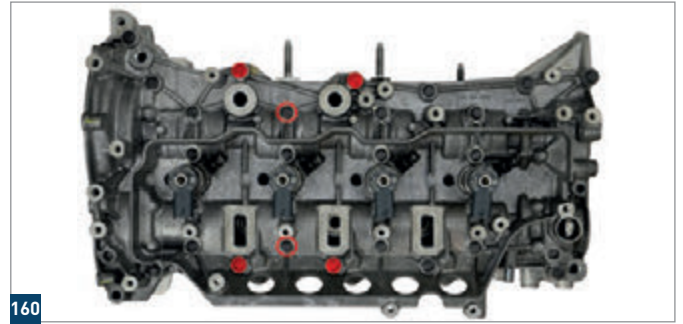
5. PLACING THE SUPPORT BRIDGE OVER THE VARIOUS CYLINDERS

5. 1. Remove the corresponding (marked in red and in red circles) cam cover bolts of the to be removed injector.

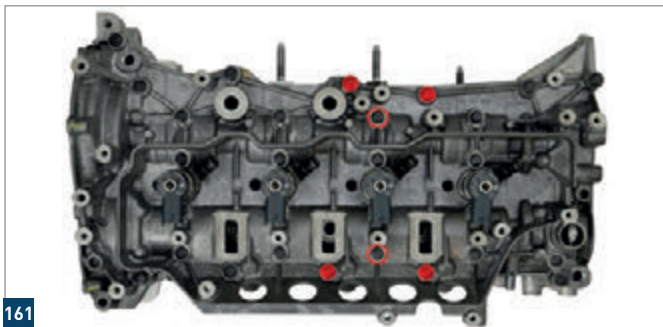
Engines M9R and M9T



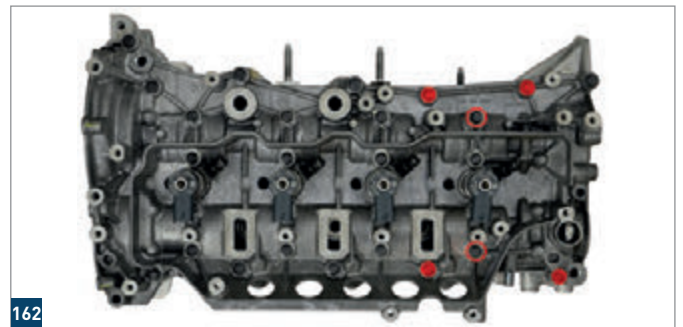
Cylinder 1



Cylinder 2

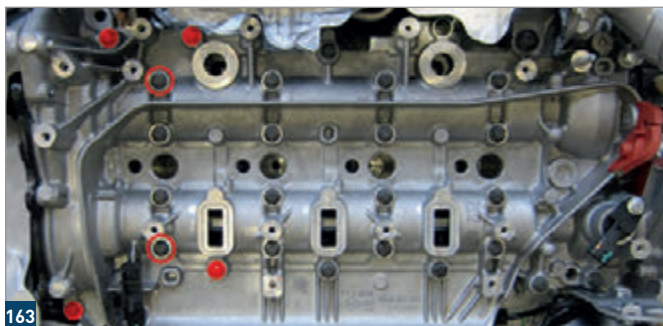


Cylinder 3

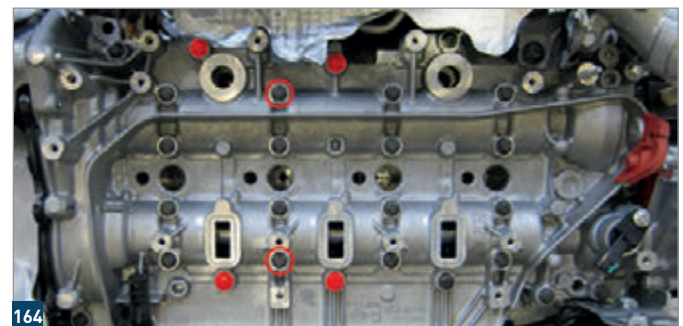


Cylinder 4

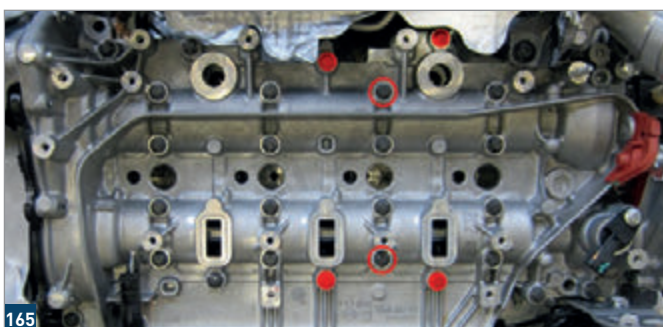
Engine R9M



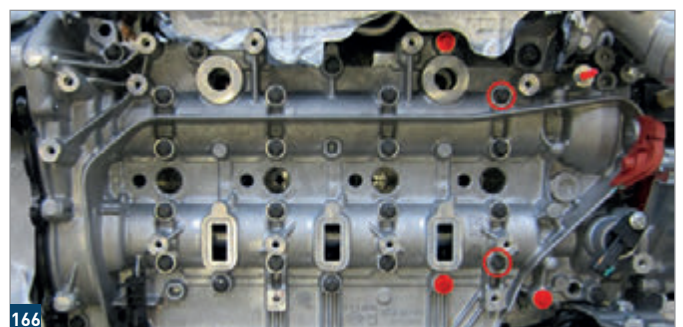
Cylinder 1



Cylinder 2



Cylinder 3



Cylinder 4



5.2 Depending on the to be removed injector screw the feet **60382224** in the with red dots marked threaded holes and tighten them with a spanner 19.



5.3 When working on 4th cylinder (see figure 4 cylinder) of the R9M engine must the Screw On Leg **60382221** be screwed onto red marked stud and tightened.



5.4 Screw both Support Legs **60382222** in the Support Bridge **60382220** and tighten them with a spanner 19.





Bleeding the hydraulic system

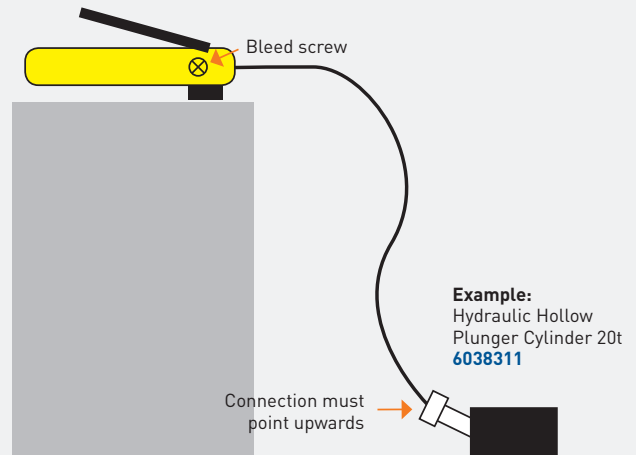
Connected hydraulic Hollow Plunger Cylinder 20t **6038311** to the hydraulic pump.

Place the Hollow Plunger Cylinder lower than the hydraulic pump so that the air can rise through the hose to the hydraulic pump. Build up pressure till the max. stroke of Hollow Plunger Cylinder is reached.

Relieve the pressure by opening the relief valve.

Repeat his procedure 4 to 5 times.

Top up the oil if necessary.



Example: hydraulic pump with hose **80255500**

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6. EXTRACTION PROCESS

- 6.1 Put the complete support bridge in such a way on the engine that the support plate **60382220-2** and the mark in the base plate **60382220-1** are facing the distributor pipe. (in picture 173 below marked with circle). D Position the two Support Legs **60382222** in the marked holes of the removed cam cover bolts. (in picture 159-166 below marked with circle).



173

- 6.2 Place the Swivel Cup Collar **60385342** and Swivel Cup **60385341** over the Extraction Spindle **60385321**, on the Support Plate **60382220-1**.



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6.3 Place the Hydraulic-Hollow Plunger Cylinder 20t **6038311** over the Extraction Spindle **60385321** on the Swivel Cup. Screw the Extraction Adapter **60385318** on the Extraction Spindle 60385321 and centre the Cylinder with the Swivel Cup Collar **60385342** and Swivel Cup **60385341**.



Build up only low pressure for 2 to 3 times at the beginning of the extraction procedure, relieve the pressure and tighten the Extraction Adapter. This allows the support bridge with the other components to align and thereby settle somewhat.



Start the extraction procedure, after about 8mm the maximum stroke of the Hydraulic Cylinder is reached. Release the pressure, screw in the Adapter and again build up the pressure.



Attention: Upon reaching 8mm lift height do not continue to pump, but relieve the pressure, screw in the Adapter and re-apply the pressure.



Repeat the procedure until the injector is extracted.

... weiter zu Ausziehvorgang Ergebnisse Fall A, page 39

... weiter zu Ausziehvorgang Ergebnisse Fall B, page 40

... weiter zu Ausziehvorgang Ergebnisse Fall C, page 41

A PULLING RESULTS – CASE A

Piezo-controlled Bosch injector or injector remains completely removed.



178

Piezo-controlled Bosch injector torn below the injector sleeve with the sleeve stuck in the cylinder head.

→ continue with point 1 page 18



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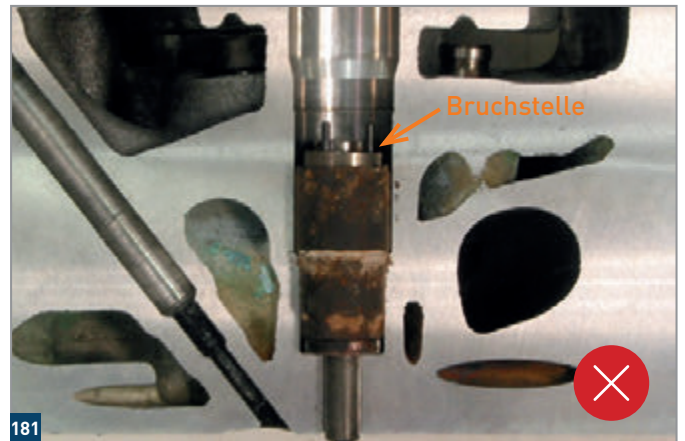


Piezo-controlled Bosch injector torn or unscrewed in the lower part of the injector screw connection.

→ continue with point 2 page 24



180



181

Cross section of the cylinder head

B PULLING RESULTS – CASE B

Solenoid valve-controlled Bosch injector or injector remains completely removed.



182

Solenoid valve-controlled Bosch injector torn below the injector sleeve with the sleeve stuck in the cylinder head.

→ continue with point 1 page 18



183

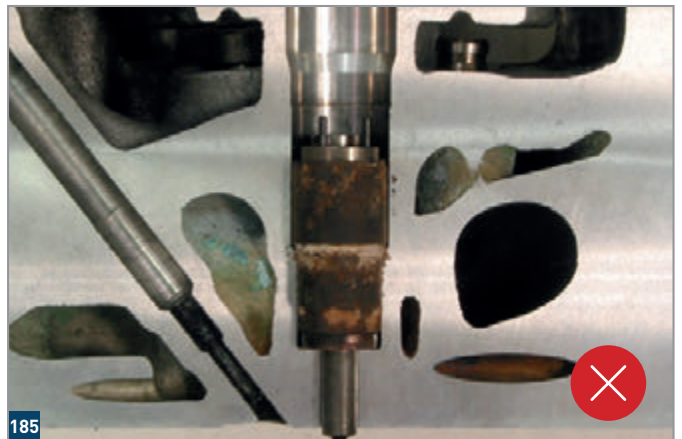


Solenoid valve-controlled Bosch injector torn or unscrewed in the lower part of the injector screw connection.

→ continue with point 2 page 24



184



185

Cross section of the cylinder head

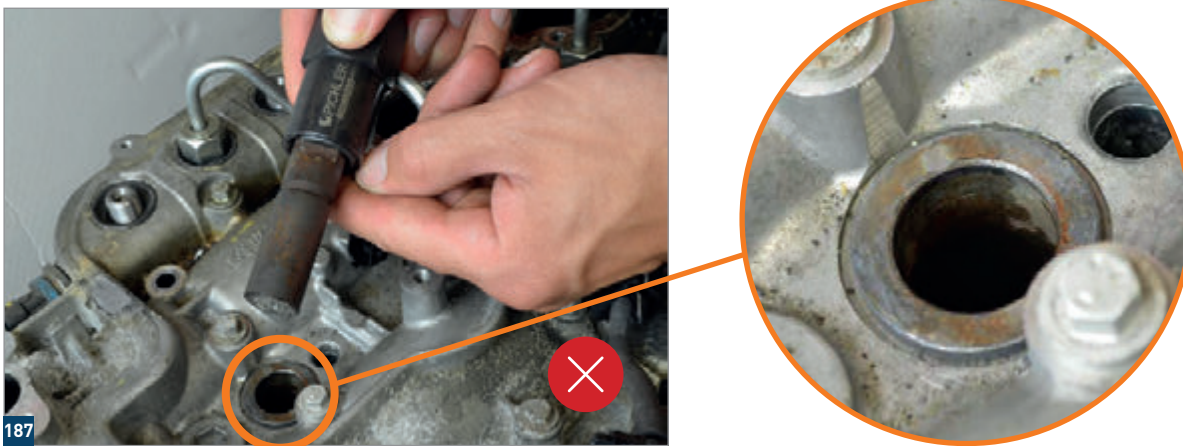
C PULLING RESULTS – CASE C

Piezo-controlled Bosch injector or injector remains completely removed.



Piezo-controlled Bosch injector torn below the injector sleeve with the sleeve stuck in the cylinder head.

→ continue with point 1 page 18





RECOMMENDED ACCESSORIES



Application:

With this set is it possible to upgrade an present Injector Removal Set M9R (60385095/60385105 - 12 tons) to the M9R / M9T / R9M (20 tons) set.

UPGRADE SET: FOR M9R 12 TONS TO THE 20 TONS M9R / M9T / R9M (20 TONS) SET

60382115

Injector Removal Upgrade Set from 60385095/60385105 to the M9R / M9T / R9M (20 tons) set



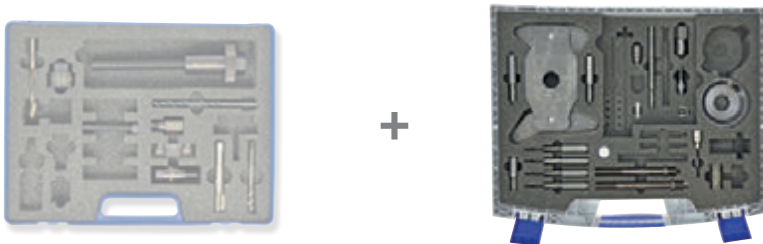
Application:

With this set is it possible to upgrade an present Injector Removal Set SOFIM (60385345) to the M9R / M9T / R9M (20 tons) set.

UPGRADE SET: SOFIM TO M9R / M9T / R9M (20 TONS)

60382125

Injector Removal Upgrade Set from 60385345 to 60382095/60382105



Application:

With this set is it possible to upgrade an present Injector Removal Set „M9R Update“ (60385050) to the M9R / M9T / R9M (20 tons) set.

UPGRADE SET: 60385050 AND 60385095/105 TO MOD. M9R / M9T / R9M (20 T.)

60382120

Injector Removal Upgrade Set from 60385050 to 60382095



Application:

With this set is it possible to upgrade an present Injector Removal Set M9R / M9T / R9M (60382095) to the SOFIM set.

UPGRADE SET: MOD. M9R / M9T / R9M (20 T.) TO INJECTOR REMOVAL SET SOFIM

60385350

Injector Removal Upgrade Set from 60382095 to 60385340/60385345



CUTTING GREASE

60200035 300 gr



RUST LOOSENER AND CONTACT SPRAY

9990020 400 ml



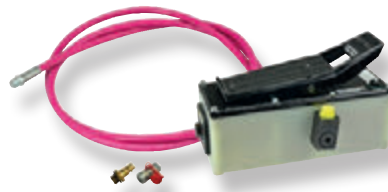
**PNEUMATIC HAMMER SET
VIBRO-IMPACT**

80257000 with 4 adapters



HYDRAULIC SET 3 PIECES

80255500



AIR HYDRAULIC PUMP 700 BAR

80255585 3 m Hose, with Hydraulic Adapter 3/8" and Ball Valve



**INJECTOR SHAFT CLEANING SET
COMPLETE**

9038100

- 9038010 Module 1 - Brushes
- 9038011 Module 1.1 - Brushing Plus
- 9038020 Module 2 - Milling
- 9038030 Module 3 - Equipment



FLEXIBLE LAMP „BAL“

40103000 410 mm long, tip 3,2 mm



FLEXIBLE MAGNETIC LIFTER Ø 8 MM

52601040 460 mm



INJECTOR SOCKET 29 DRIVE 1/2"

6038422



TUNGSTEN CARBIDE ROTARY BURR

67050120 12 x 150 mm

67050100 10 x 150 mm

67050060 6 x 150 mm

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