



# UNIVERSAL REMOVER KIT FOR BROKEN INJECTORS PSA 2.0 L / 2.2 L DW10 / DW12

Manual

60382400



## SAFETY NOTICE

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**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

## CONTENT

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## UNIVERSAL REMOVER KIT

Art-Nr. 60382400

| No | Article no. | Description                      | 60382400 |
|----|-------------|----------------------------------|----------|
| 1  | 60385245    | Nut M16 for Extraction Spindle   | 1        |
| 2  | 60385244    | Groove Ball Bearing              | 1        |
| 3  | 60385222    | O-ring                           | 1        |
| 4  | 6536451     | Adapter internal M16 to internal | 1        |
| 5  | 60385210    | Adapter M16x2                    | 1        |
| 6  | 60382404    | Support Plate Specific for DV6   | 1        |
| 7  | 60382401    | Support Sleeve Narrow Reversible | 1        |
| 8  | 60382411    | Support Sleeve Wide Reversible   | 1        |
| 9  | 60382406    | Support Plate Reversible         | 1        |
| 10 | 60382403    | Extraction Spindle M16x1.5 / M16 | 1        |
| 11 | 60382413    | Extraction Spindle M18x1.5 / M16 | 1        |
| 12 | 90417911    | Cutting Oil 25ml                 | 1        |
| 13 | 60385339    | Tap M16x1.5 mm                   | 1        |
| 14 | 60385333    | Tap Holder                       | 1        |
| 15 | 60385338    | Tap M18x1.5 mm                   | 1        |
| 16 | 151.20425   | Hexagon Key 2.5 mm               | 1        |
| 17 | 60390081    | Setting Tool For Sealing Plugs   | 1        |
| 18 | 60390102    | Sealing Plugs 10 mm              | 2        |
| 19 | 60382331    | Centring Cone Big                | 1        |
| 20 | 60383425    | Double Pin Wrench                | 1        |
| 21 | 60382430    | Extra Pins for 60383425          | 20       |
| 22 | 60385331    | Centering Guide                  | 1        |
| 23 | 60382155    | Shank                            | 1        |
| 24 | 60385217    | Pull Rod for Straddling Dowel    | 1        |
| 25 | 60385218-1  | Brass Straddling Dowel           | 4        |
| 26 | 60382217    | Magnetic Attachment              | 1        |

## 1. PIEZO OR SOLENOID CONTROLLED INJECTOR IS TORN OR UNSCREWED IN THE BOTTOM THREADED SECTION

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E.g.: injector torn

E.g.: injector unscrewed in the threaded section

**1.1** Screw the **Magnetic Attachment 60382217** onto the **Pull Rod 60385217** as far as it will go and remove the remaining parts with the magnet from the injector shaft. Spray subsequently a rust dissolver e.g. **9990020** (not included in the kit) in the injector shaft and allow it to react.

**1.2** Insert the **Shank 60382155** in the injector shaft together with the appropriate **Centring Cone 60382331** or **60385331**. Release with an air impact hammer and suitable attachment e.g. **80257000** (not included in the set) the nozzle body.

nozzle body

**1.3** Determine which nozzle needle body is installed in the injector.



**1.4** Slide the appropriate **Centring Cone 60382331** or **60385331** onto the **Double Pin Wrench 60383425**. Then insert the combination with the appropriate end face (A for Type A or B for Type B) in the injector shaft.

**1.5** Insert the Pins of the **Double Pin Wrench** in the lateral holes of the nozzle body and release by carefully turning left and right by means of an tool **14 (TYPE A)** or **15 (TYPE B)** the needle body .



## 1.6 REPLACING A PIN OF THE DOUBLE PIN WRENCH

Clamp a fork spanner 12 for **TYPE A** or 9 for the **TYPE B** Double Pin Wrench End in a vice and place the **Double Pin Wrench** in the spanner as shown in the picture.

Place a new **Pin 60382430** with pointed pliers on the broken Pin and only hammer the new Pin in until the broken Pin can be removed.

(Warning: bevel of the replacement Pin = insertion direction)

pay attention  
to the insertion  
direction



Turn the **Double Pin Wrench** 90° and hammer the new **Pin** flush with the rear of the hole.

flush

### ATTENTION

If the Spare Pin can be pulled out or pushed in by hand, the back of the bore must be slightly crimped with a drift punch Ø1.8mm.

**1.7** Remove the released nozzle body from the injector shaft using the **Magnetic Attachment 60382217** screwed on the **Pull Rod 60385217**.

... continue on page 10 mit with point 1.11

...continue on page 9 mit with point 1.8

**1.8** If the nozzle needle is not yet removed, remove it with a magnet from the nozzle body.

**1.9** Screw the **Brass Dowel 60385218-1** loosely onto the **Pull Rod 60385217** and insert it in the bore of the nozzle body.



**1.10** Turn the knurled wheel at the end of the Pull Rod clockwise so that the brass dowel expands. Now remove the nozzle body from the injector shaft.

- 1.11 Screw a **Sealing Plug 60390102** onto the **Setting Tool For Sealing Plugs 60390081** and close the hole in the injector shaft to the combustion chamber.



### 1.12 Determination of the injector rest still stuck in the cylinder head.

It has to be determined how much of the broken or unscrewed injector still is stuck in the injector shaft. This can be done by comparing a new or complete removed injector and the already removed part (s) of the injector. The outside diameter of the injector rest in the injector shaft can be determined by measuring the new injector (see picture below).

Ø17 (Ø19)



Ø17    Ø19



— Torn off injector

— New injector with a non stepped screw connection Ø17mm (Ø19mm).

— New injector with a stepped screw connection Ø17mm and Ø19mm.

**ATTENTION:** For **injectors** with a stepped screw connection, a thread is to be cut (if still possible) in the part with the larger outer diameter (19mm) of the still stuck injector rest in the cylinder head. If this is no longer possible, the thread is cut in the part with the smaller outer diameter (17 mm).



sufficient rest for Ø 19 mm



not sufficient rest for Ø 19 mm

Diameter 19 mm ... continue on page 11

Diameter 17 mm ... continue on page 13



## 2. REMOVING INJECTOR REST WITH OUTSIDE Ø19MM OF MAGNETIC OR PIEZO CONTROLLED INJECTORS

2.1 Clamp the Tap **M18x1.5 60385338** in the **Tap Holder 60385333** and clamp it with the grub screw using the **Hex Key 151.20425**.

2.2 Slide the appropriate **Centring Cone 60382331** or **60385331** on the **Tap Holder**, moisten the **Tap M18x1.5** with **Cutting Oil 90417911** and insert it in the injector shaft.

2.3 Using a suitable tool **13**, cut thread M18x1.5 in the still fixed injector rest.



**2.4** Screw the **Extraction Spindle M18X1.5 / M16 60382403** in the previously cut thread and tighten it with a suitable tool **10**.

**2.5** Continue with extraction:

**mechanically with a slide hammer... page 15**

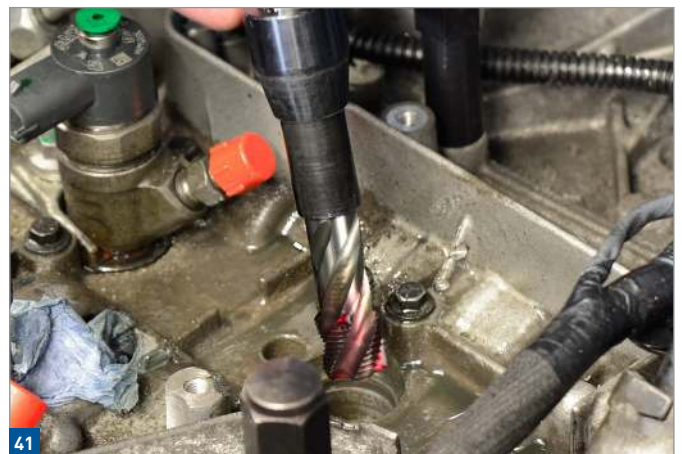
**mechanically with Nut and Bearing or hydraulically ... page 16**

### 3. REMOVING INJECTOR REST WITH OUTSIDE Ø17MM OF MAGNETIC OR PIEZO CONTROLLED INJECTORS

3.1 Clamp the **Tap M16x1.5 60385339** in the **Tap Holder 60385333** and clamp it with the grub screw using the **Hex Key 151.20425**.



3.2 Slide the appropriate **Centring Cone 60382331** or **60385331** on the **Tap Holder**, moisten the **Tap M16x1.5** with **Cutting Oil 90417911** and insert it in the injector shaft.



3.3 Using a suitable tool **13**, cut thread M16x1.5 in the still fixed injector rest.



**3.4** Screw the **Extraction Spindle M16X1.5 / M16 60382403** in the previously cut thread and tighten it with a suitable tool **10.**

**3.5** Continue with the extraction:

**mechanically with a slide hammer... page 15 point 4**

**mechanically with Nut and Bearing or hydraulically ... page 16 point 5**

## 4. EXTRACTION WITH A SLIDE HAMMER (8KG/ 5KG)

4.1 Slide the appropriate **Centring Cone** 60382331 or 60385331 over the screwed in **Extraction Spindle** in the injector shaft.



4.2 Screw the **Adapter** 6536451 onto the **Extraction Spindle** and tighten it with a suitable tool 22.

4.3 Screw the present **Slide Hammer** (e.g. 8kg 6148800 or 5kg 6148790 both not included in the set) preferably with **Ball Joint** 6038424 in the **Adapter** 6536451 and tighten it.  
Subsequently start the extraction.

**OR**

**+**

**=**

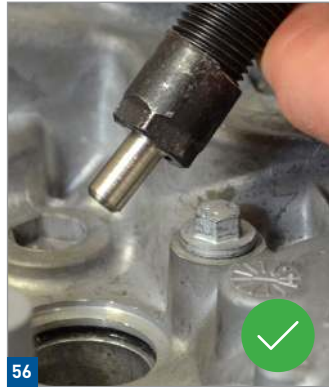
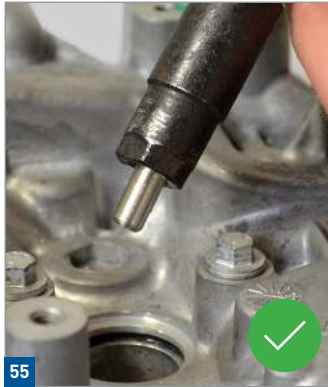
Slide Hammer  
8kg 6148800

Slide Hammer  
5kg 6148790

Ball Joint Adapter  
6038424

Extraction

#### 4.4 Result of the extraction:



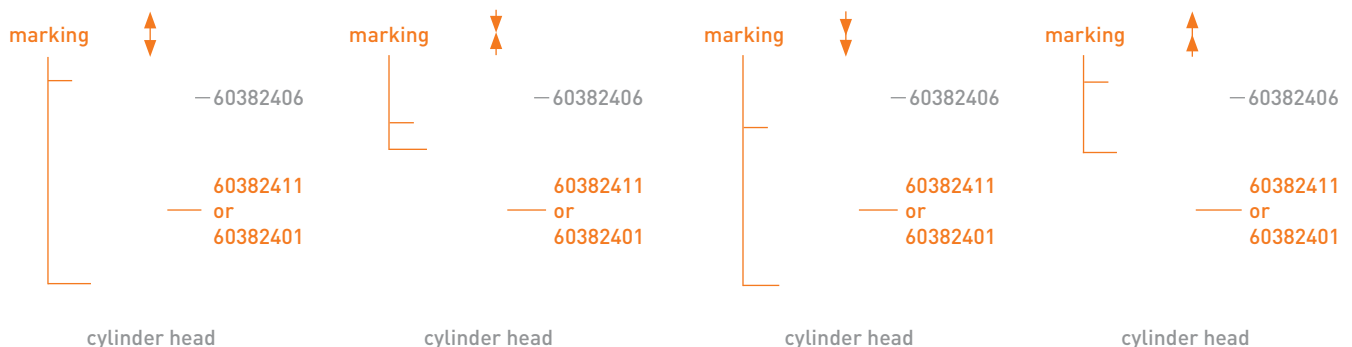
... continue on page 10 mit with point 1.12

## 5. PLACING THE SUPPORT DEVICE (MECHANICAL OR HYDRAULIC)

5.1 Place the appropriate Support Sleeve on the cylinder head.



5.2 When placing the **Reversible Support Plate 60382406**, pay attention to that the marking ring on the **Support Sleeve** and the marking on the **Reversible Support Plate** either point towards or away from each other. (See figures 61-64)



TRUE

TRUE

FALSE

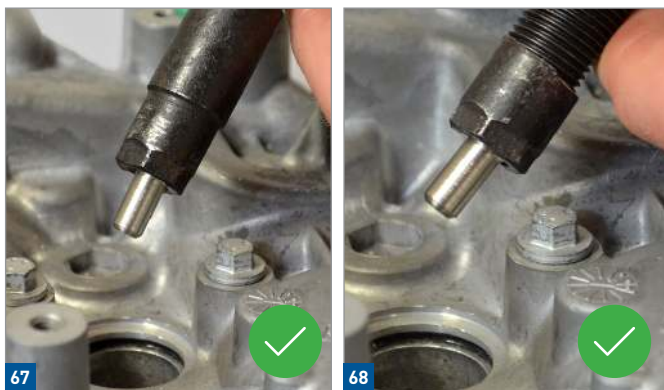
FALSE



## 6. EXTRACTION MECHANICALLY WITH NUT AND BEARING

**6.1** Screw the Nut with **Bearing Guide 60385245** with **Ball Bearing 60385244** and **O-Ring 60385222** onto the **Extraction Spindle**. By turning the **Nut** with a suitable tool **22** and simultaneously holding the hexagon of the **Extraction Spindle 10** remove the injector rest.

**6.2** Result of the extraction:



... continue on page 10 mit with point 1.12

## 7. EXTRACTION HYDRAULICALLY WITH A HOLLOW PLUNGER CYLINDER

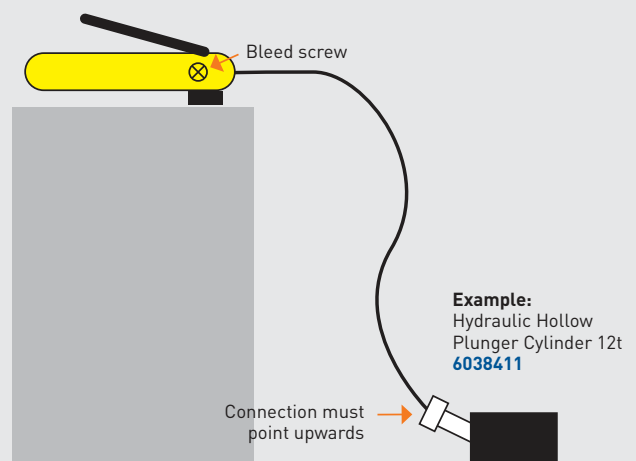
**7.1** Bleeding the hydraulic system:

### Bleeding the hydraulic system

Connected hydraulic Hollow Plunger Cylinder to the hydraulic pump 12t **6038411**.

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.



**7.2** Place the bled hydraulic hollow plunger cylinder (not included in the set) on the **Reversible Support Plate** and screw the **Pull Adapter 60385210** on the Spindle.

**7.3** Extraction of the injector:



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 to align with the other components 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.

**7.4** Result of the extraction:

... continue on page 10 mit with point 1.12



## RECOMMENDED ACCESSORIES

SLIDE HAMMER 8 KG

6148800

SLIDE HAMMER 5.0 KG

6148790

ADAPTATEUR ARTICULÉ M18X1.5

6038424

CYLINDRE HYDRAULIQUE CREUX 12 T

6038411

AIR HYDRAULIC PUMP 700 BAR

8025575

HYDRAULIC SET 3 PIECES

8025500

TUNGSTEN CARBIDE ROTARY BURR

67050120 / 100 / 060



PNEUMATIC HAMMER SET VIBRO-IMPACT

80257000

INJECTOR SHAFT CLEANING SET

9038100





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