



Fitting and removing injection pump

1. Commercially available tools:

- o Socket wrench insert, 10 mm, twelve-sided
- o Toothed insert for socket wrench 8117
- o Rotation angle gauge: 8190

Special tools:

- o Rotation device: 100320
- o Presser tool: 100830
- o Special pliers: 103220
- o Extractor: 110030
- o Special wrench: 110500
- o Slide hammer extractor: 150800
- o Plugs and caps: 170160
- o DEUTZ AP1908 assembly product

WARNING



During work on the fuel system always maintain conditions of the maximum cleanliness. Before proceeding with removal, remove any paint residue or debris. Thoroughly clean the area around the components to be worked on. Dry any wet areas with a compressed air jet. When handling fuel observe the safety directives and specific local regulations. All fuel lines and unions should be closed immediately after opening using new, clean plugs or caps. Remove plugs and caps only immediately prior to assembly. Collect auxiliary materials in suitable containers and dispose of them in compliance with the applicable regulations.

NOTE



If replacing the injection pump, remeasure the thickness of the shim. The EP code must be changed on the factory plate. In the event of replacement of the crankcase, camshaft or roller tappets, determine the correct assembly measurement of the injection pump "EK" and the relative part number EP, and modify accordingly on the identification plate.

Disassembly of the injection pump

- o Remove the hollow connector from the engine block.
- o Disassemble the cylinder head case (1).
See para. Disassembly and assembly of the cylinder head



1.

- o Remove screws (1).

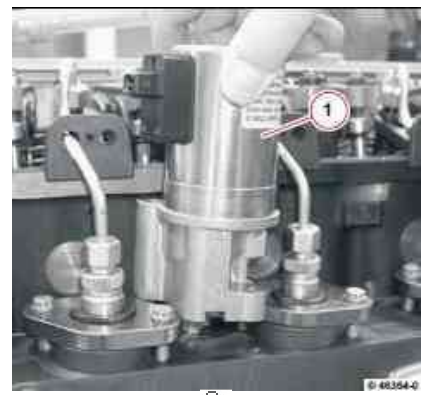


2.

- o Withdraw the engine block (1).

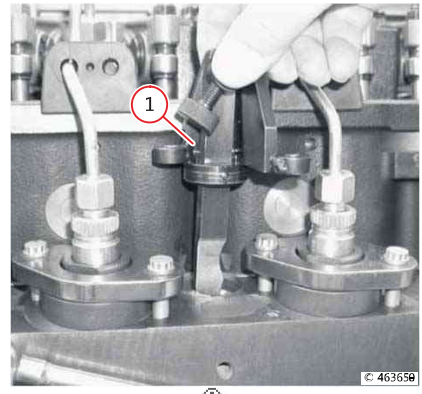
3.

- o Fit the presser tool (1).




4.

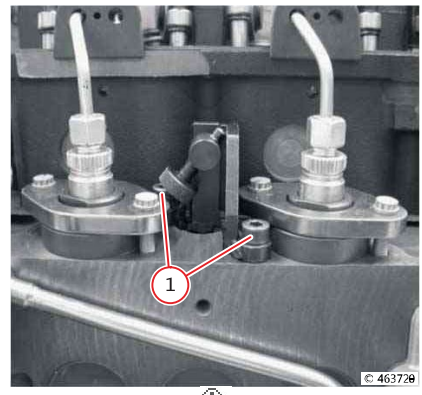
- o Tighten (1) the screws.



5.

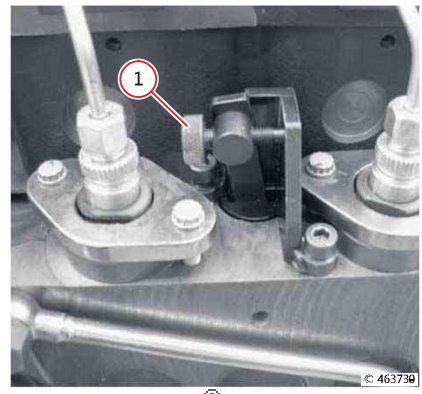
- o Turn the knurled screw (1).

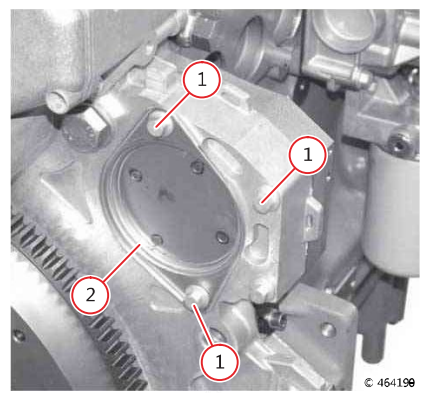
 **NOTE**
Turn the knurled screw until it stops (adjuster rod end stop)



6.

- o Remove screws (1).
- o Remove cover (2).





7.

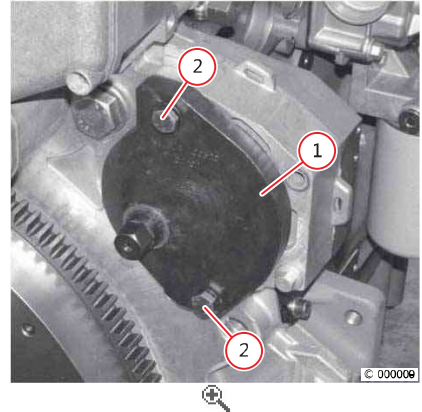
- o Insert rotation device (1).



NOTE

The toothed wheel of the rotation device must mesh with the teeth of the camshaft gear.

- o Tighten screws (2).



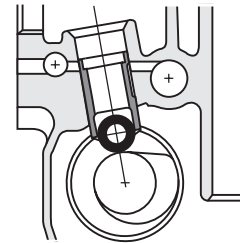
8.

- o Turn the crankshaft in the correct direction of rotation of the engine to align the injector pump actuator cam for the respective cylinder with the base disc.



Example:

The intake valve of cylinder 1 is open.



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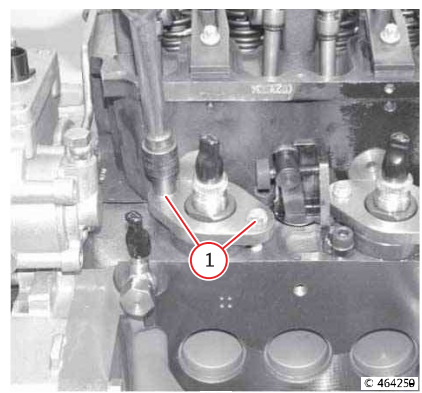
9.

- o Remove the injection pipe with a special wrench.




10.

- o Remove screws (1).

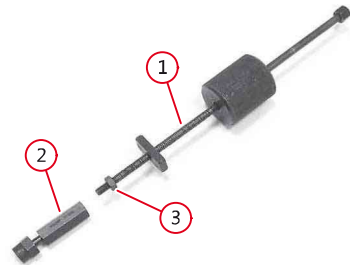


- 11.
- Remove the flange

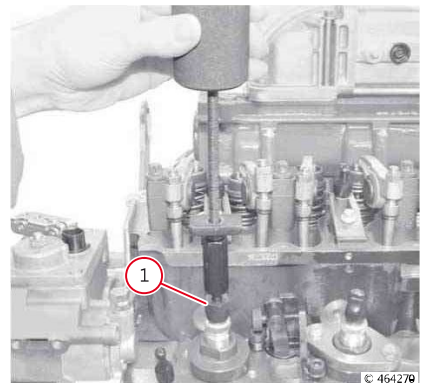


- 12.
-  **NOTE**
If the injection pump is seized:

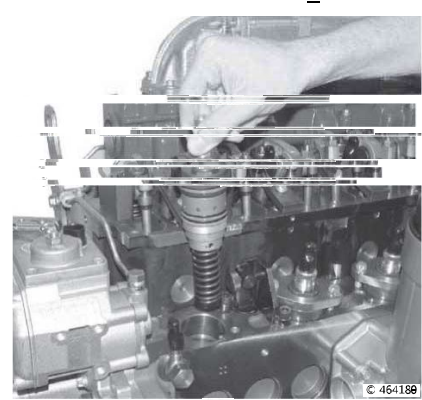
- Assemble the slide hammer extractor (1) and extractor (2).
- Tighten the check nut (3).



- 13.
- Fit the slide hammer extractor onto the injection pump.
 - Screw the sleeve nuts (1).
 - Remove the seized injection pump.

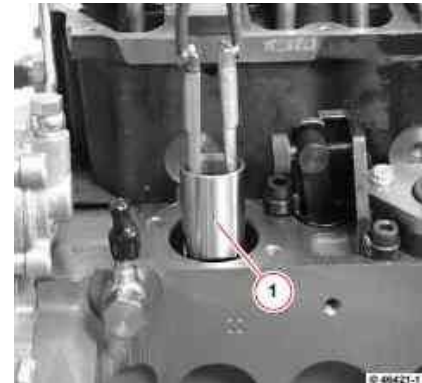


- 14.
- Remove the injection pump.
 - Carry out a visual inspection of the component.



15.

- o Withdraw roller tappet (1) using the special pliers
- o Remove the shim washer.
- o Carry out a visual inspection of the components.



16.

Assembly of the injection pump



NOTE

If replacing the injection pump, remeasure the thickness of the shim. The EP code must be changed on the factory plate.

- o Calculating the thickness of the shim washer (engine without variable injection timing adjuster).
See para. See para.
- o Calculating the thickness of the shim washer (engine with variable injection timing adjuster).
See para. See para.
- o Insert the roller tappet (1) using the special pliers.



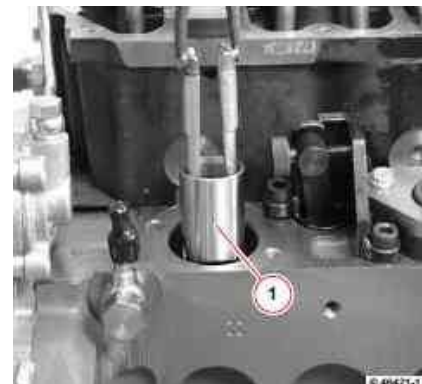
NOTE

In the event of replacement of the crankcase, camshaft or roller tappets, determine the correct assembly measurement of the injection pump "EK" and the relative part number EP, and modify accordingly on the identification plate.

- o Determination of the overall dimensions of the injection pump (engine without the injection advance variator)
See para. See para.
- o Determination of the overall dimensions of the injection pump (engine with the injection advance variator)
See para. See para.

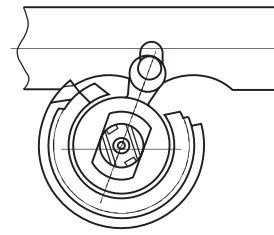
1.

- o Fit the new O-rings (1).



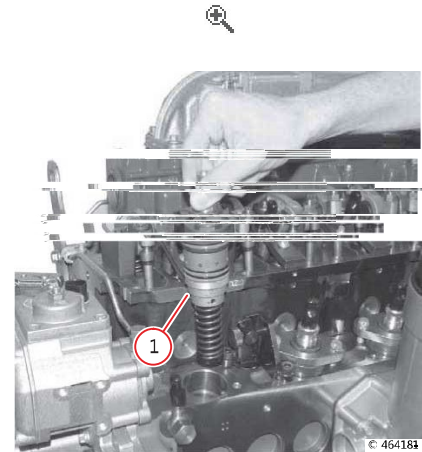
2.

- o Rotate the injection pump actuator arm into approximately the central position.



3.

- o Apply assembly sealant to the seat hole in the crankcase and to the injection pump O-ring.
- o Place the roller tappet for the respective cylinder on the base disc.
- o Assemble the injection pump.
- o Connect the injection pump actuator arm (1) to the adjuster rod.



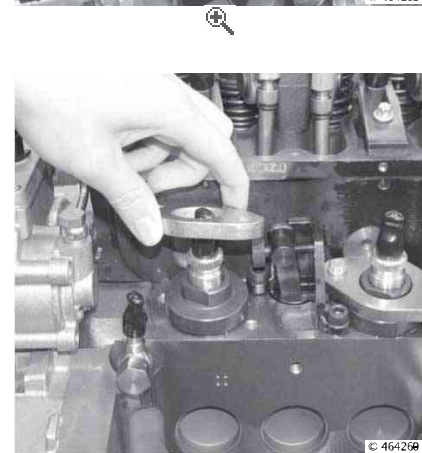
4.

- o Fit the flange.



NOTE

The bevelled side must face towards the injection pump body.



5.



NOTE

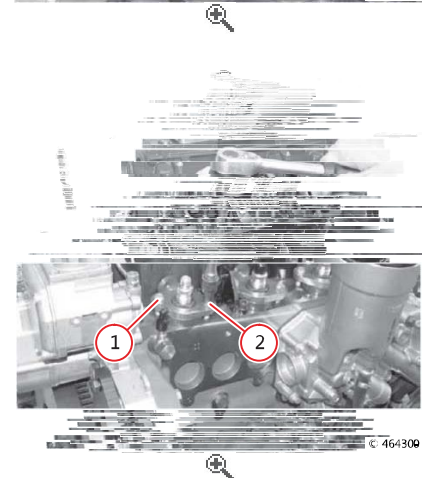
Start each time with the screw (2).

- o Lightly oil screws (2).
- o Lightly oil screws (1).
- o Tighten the screws evenly with the socket wrench insert. 5 Nm + 80°.



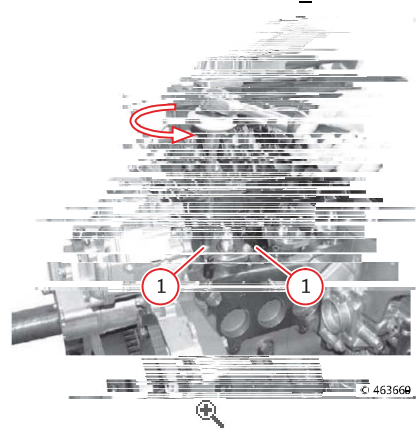
WARNING

The flange must sit evenly against the respective surface.

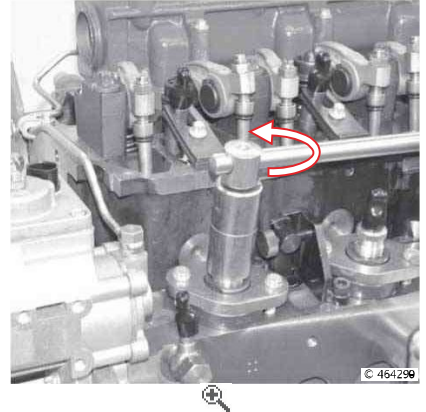



6.

- o Turn all the screws (1) by 190° in the direction indicated by the arrow.

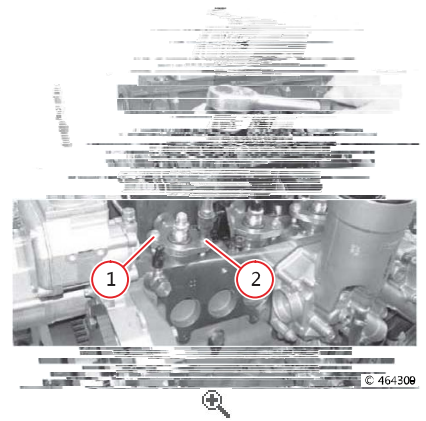


- 7.
- o Using the toothed socket wrench insert, carefully rotate the injection pump in the direction indicated by the arrow until it stops.

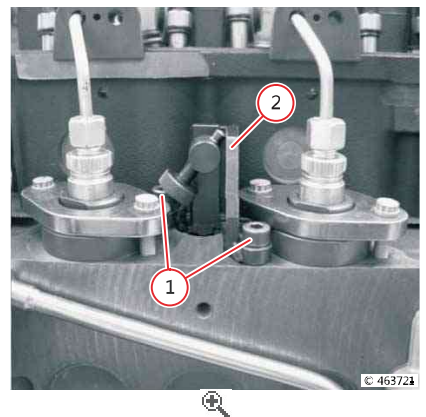


- 8.
-  **NOTE**
Start each time with the screw (2).

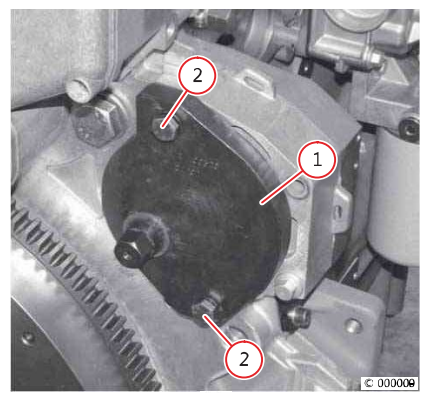
- o Tighten screws (1) and (2). 5 Nm + 150°.
- o Fasten the new injection pipes with the special wrench: 25 Nm.



- 9.
- o Remove screws (1).
 - o Remove the presser tool (2).



- 10.
- o Remove screws (2).
 - o Remove rotation device (1).



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11.

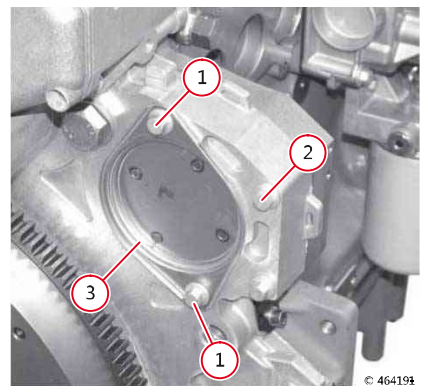
- Clean the mating surfaces of the cover plate and the gearbox cover.
- Fit a new O-ring (1).
- Lightly lubricate the O-ring.



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12.

- Fully press down the cover (3).
- Tighten the screw (2): 30 Nm.
- Tighten the screws (1): 21 Nm.



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13.



WARNING

Check the mobility of the adjustment rod.

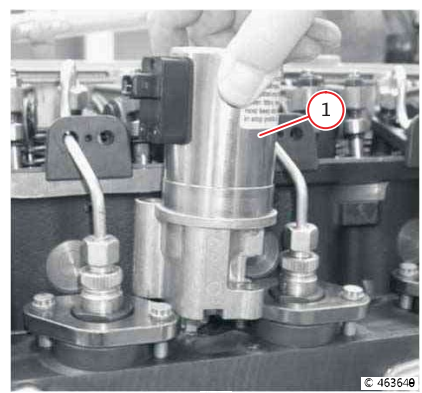
- Operate the stop lever between the start and stop position.
- Fit a new O-ring (1).
- Lightly lubricate the O-ring.



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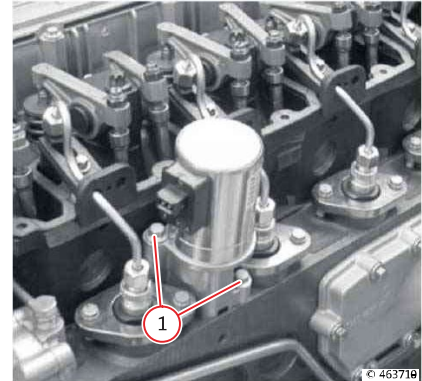
14.

- Press and hold down the adjustment rod in the stop position, using the stop lever.
- Insert the engine block (1).



15.

- Tighten the screws (1): 21 Nm.



16.

- Fit the cylinder head cover (1).
See para. Disassembly and assembly of the cylinder head
- Fit the hollow connector on the engine block.



17.



Determine the thickness of the shim (engine without injection advance variator)

1. Commercially available tools:

- o Torque wrench



NOTE

Let the engine cool down for at least one hour. Lubricant oil temperature < 40 °C. In order to exclude measurement errors, all the support and measurement surfaces must be completely clean!



NOTE

The following description, by way of an example, makes reference to an injection pump. If carrying out the work procedure on another injection pump, proceed in the same manner.

- o Disassemble the injection pump.
See para. Fitting and removing injection pump



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2.

- o Read the EP code on the factory plate for the corresponding cylinder.
Example: P/N EP 295 for cylinder 1 (1).
- o Read and write down the correct assembly dimension for the EK injection pump based on the EP code. Example: EK = 120.875 mm.



NOTE

Table 3 - see the technical specifications



1



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3.

- o Read the code for the (new) injection pump for the length of the injection pump (dimension A). Example: Measurement A = 42.
- o Write down dimension A in order to calculate the theoretical thickness of the TS shim.
- o Read and write down the base dimension L0 of the injection pump. Example: 117.5 mm.



NOTE

Table 1 - see the technical specifications

- o Calculate the thickness of the shim.



NOTE

Tables 1, 2, 3 - see the technical specifications



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Calculation example:

Target:	Theoretical thickness of shim washer T Effective thickness of shim washer SS
Data:	Injection pump length code A. Base size of injection pump L0 from table 1, e.g. 117.15 mm. EP part number (from factory identification plate) e.g. 295. Correct assembly measurement of injection pump EK

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