

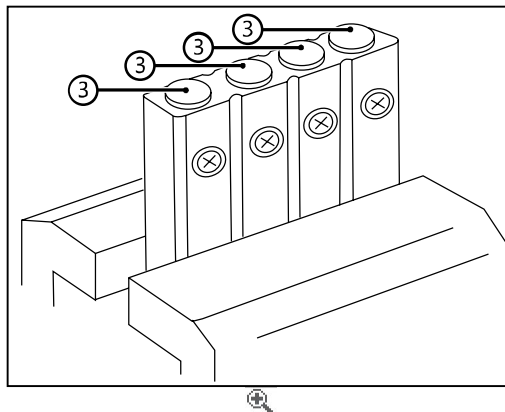
4. Tappet adjusting shim
5. Lower spring seat
6. Plunger
7. Plunger spring
8. Upper spring seat
9. Control sleeve
10. Control rack
11. Delivery valve holder
12. O-ring
13. Delivery valve spring
14. Delivery valve gasket
15. Delivery valve
16. Plunger barrel
17. Pump housing

Removal of the tappets

Hold the injection pump in a vice with the tappet side (3) facing upwards.

Using a screwdriver, separate the lock plate from the tappet guide pin.

Rotate the tappet guide pin 180° to release it.

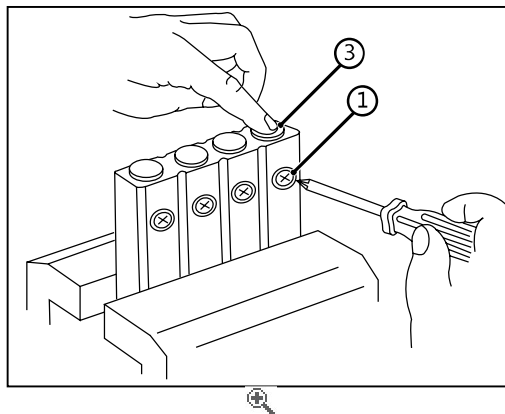


1.

Remove tappet guide pin (1) with long-nose pliers while pushing down on tappet (3), then remove the tappet.

Repeat the above procedure to remove all the remaining tappets.

- The tappet may be expelled from its bore when the tappet guide pin is removed. Hold the tappet to prevent it from falling. Hold the tappet to prevent it from falling.



2.

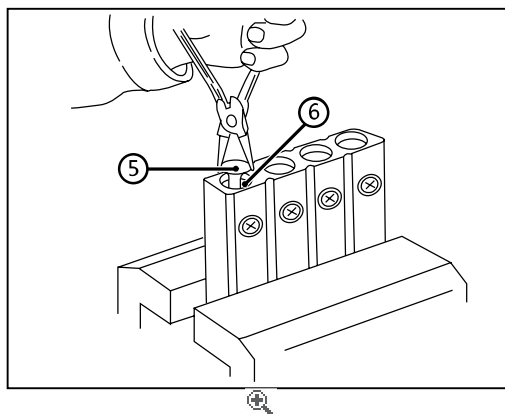
Removal of the plungers

Remove the tappet adjustment shim.

Using pliers, remove lower spring seat (5) and plunger (6).

Remove upper spring seat and control sleeve.

Repeat the above procedure to remove all the remaining plungers, then remove the control rack.

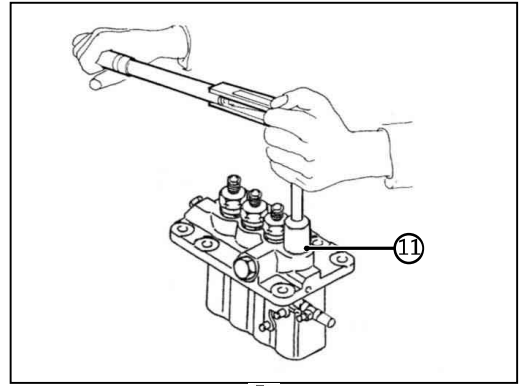


1.

Removal of the delivery valves

Turn the injection pump upside down and hold it in a vice.

Remove delivery valve holder (11), then remove the spring and the gasket.

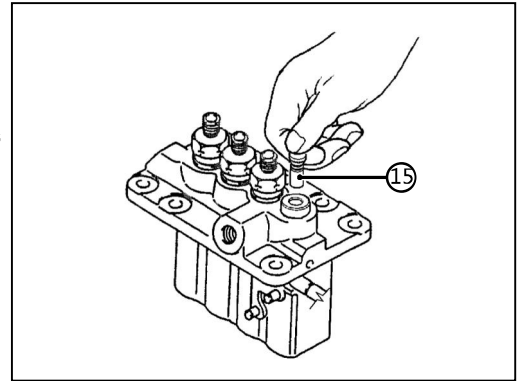


1.

Remove the delivery valve (15) with pliers.

Repeat the above procedure to remove all the remaining delivery valves.

- The delivery valves are delicate components. Keep them as clean as possible.

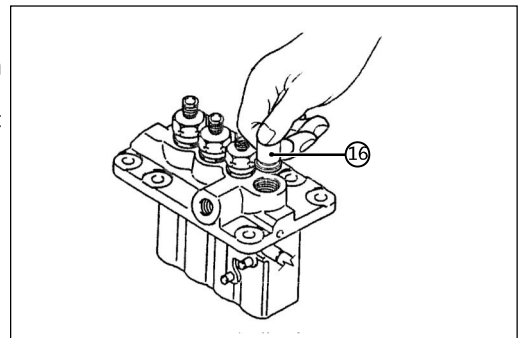


2.

Removal of the plunger barrels

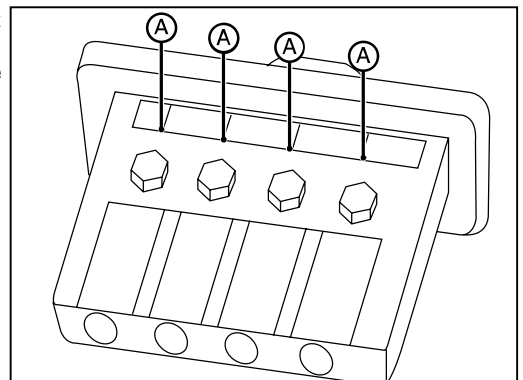
Remove barrels (16) from their bores.

- The plungers and barrels are delicate components. Keep them as clean as possible.
- Keep the plungers with their respective barrels for subsequent installation. Do not use barrels with other plungers.



1.

- When renewing the plungers and barrels or delivery valves, do not loosen the adjusting plates (A) between the pumping elements.
- After renewing components, the injection pump delivery must be measured. Use the specific tester to measure the injection pump delivery.
- Keep disassembled injection pump parts in clean diesel fuel.



2.

Inspection

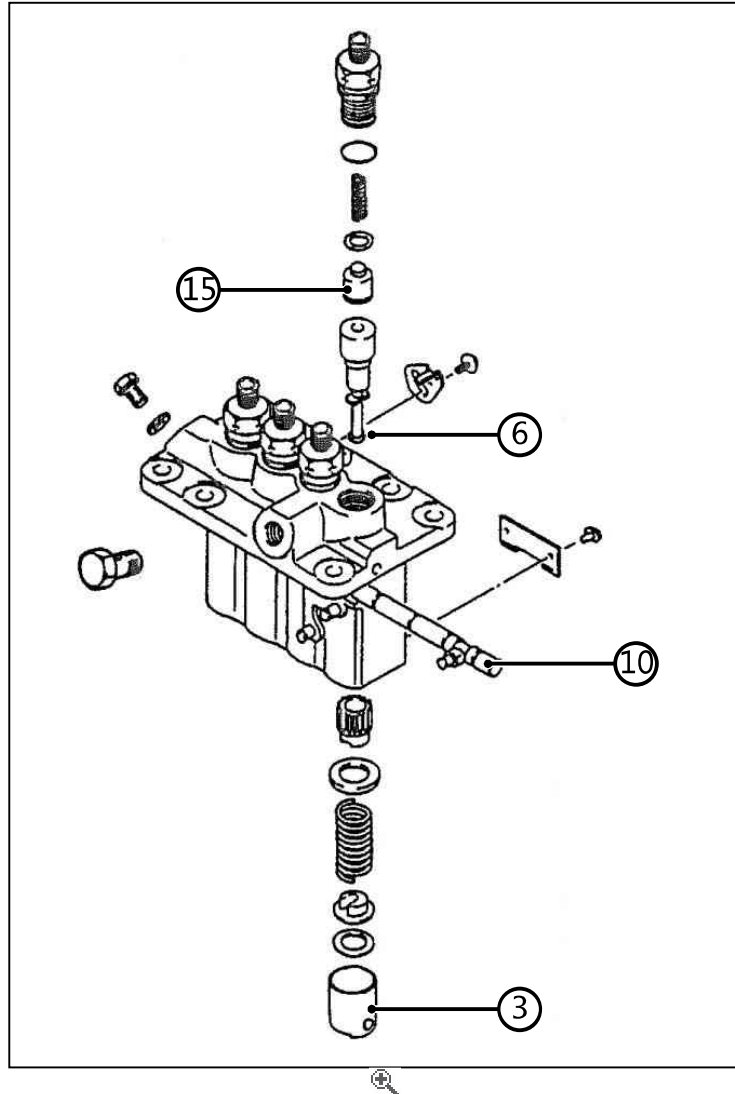


Fig. Inspection points

- 1. Inspect delivery valves (15) for signs of wear or damage.
- 1. Inspect tappets (3) for signs of wear.
- 1. Inspect plungers (6) for wear, rust or scoring.
- 1. Check control rack (10) moves correctly.

Assembly

To assemble, follow the disassembly steps in reverse order.

Use the following procedure:

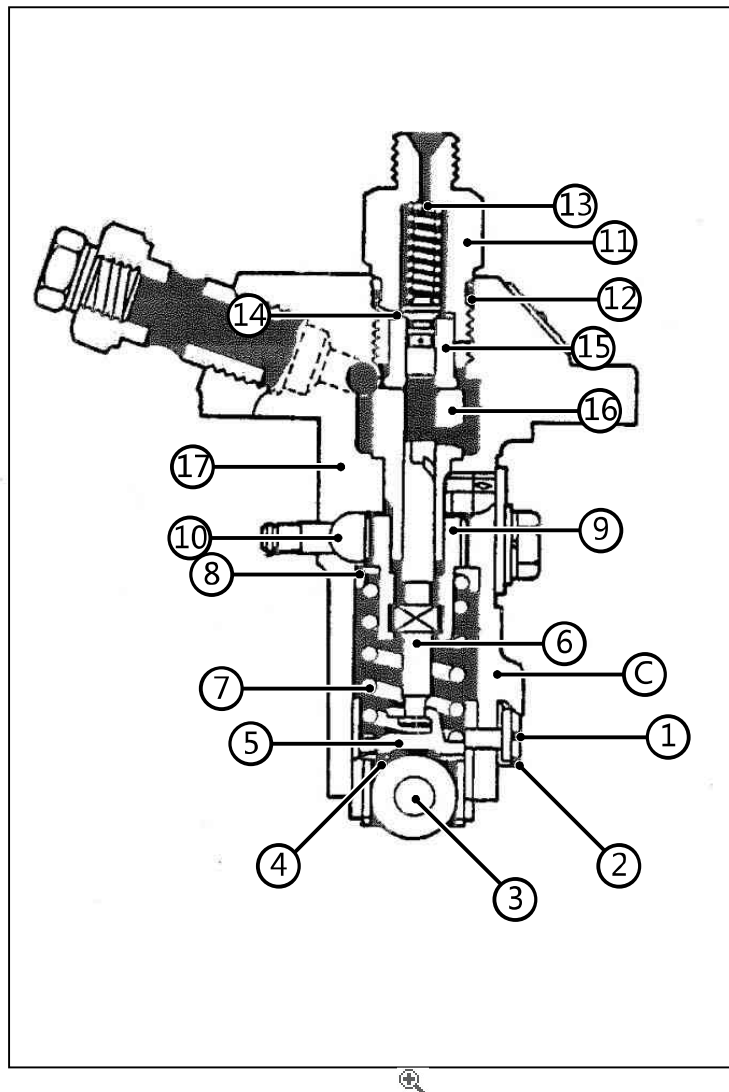


Fig. Assembly procedure

1. Tightening torque: $4.5 \pm 0.5 \text{ kgf xm}$ ($32.5 \pm 4 \text{ lbf x ft}$) [$44 \pm 5 \text{ Nm}$]

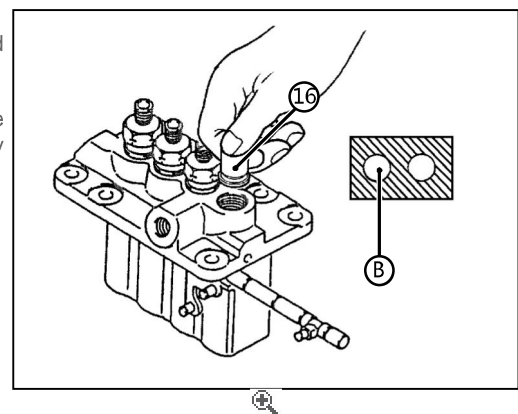
1. Use a new O-ring (12).

1. Use a new lock plate (2).

Refitting the barrels

Locate each barrel (16), aligning the groove with locating dowel (A) and inserting it squarely into its bore.

- If the groove in the barrel is not aligned with the locating dowel, the O-ring will not seat correctly (it will still be visible) after the delivery valve holder has been installed.



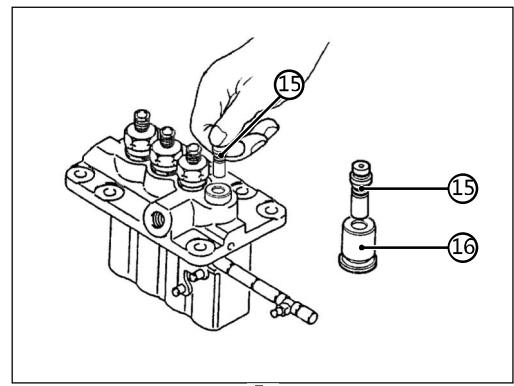
1.

Refitting the delivery valves

Install delivery valve (15), gasket, spring and O-ring in the barrel (16) and then tighten the delivery valve holder by hand.

Repeat this procedure to refit all the remaining delivery valves.

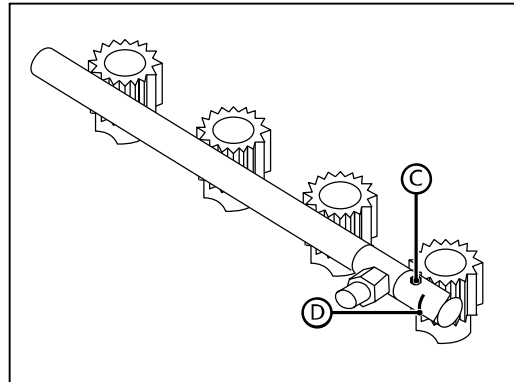
- Every time the fuel injection pump is disassembled, a new O-ring (12) must installed.
- Take care not to damage O-rings (12) with the threads of delivery valve holder (11).



1.

Refitting the control sleeves

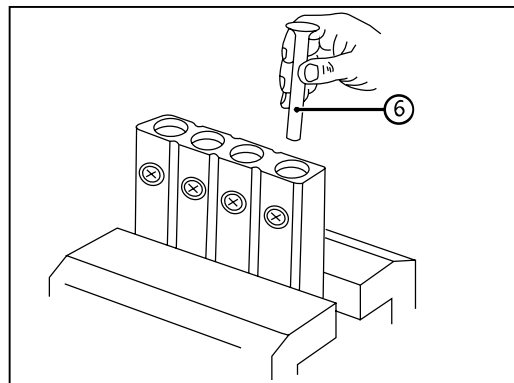
Install each control sleeve with the center tooth (C) aligned with the reference mark on the control rack (D).



1.

Locate plungers (6) in their respective barrels.

- Make sure the notch in the plunger is pointing toward the adjustment plate.

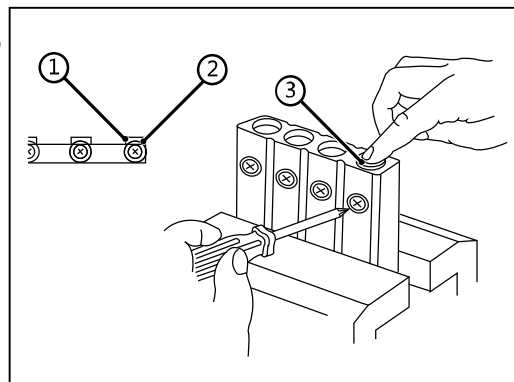


2.

Refitting the tappets

Move the control rack back and forth while pushing down on each tappet (3) to align the slot in the tappet with the hole in the housing for the tappet guide pin. Locate lock plates (2) and tappet guide pins (1).

- Every time the fuel injection pump is disassembled, new lock plates must installed.

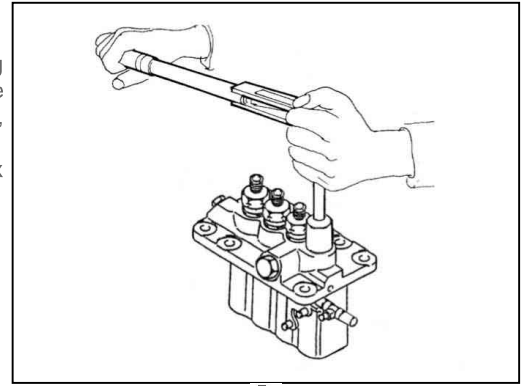


1.

Refitting the delivery valve holder

Locate the delivery valve holders and tighten them to the specified torque.

- Do not over tighten the delivery valve holders to avoid applying excessive force on the barrels and preventing free movement of the plunger. If the holders are not tightened to the specified torque, engine oil leaks may develop in the fuel injection pump.
- Delivery valve holders $4.5 \pm 0.5 \text{ kgf} \times \text{m}$ ($32.5 \pm 4 \text{ lbf ft}$) [$44 \pm 5 \text{ N} \times \text{m}$]



1.

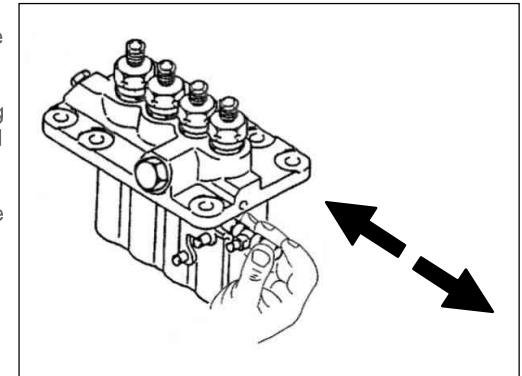
Post-assembly inspection

Immediately after reassembling the fuel injection pump, check that the control rack moves freely without any binding or catching.

If the control rack fails to move freely, the possible causes are Pumping element(s) sticking; Foreign particles lodged between control rack and sleeves; Over-tightening of delivery valve holder(s).

Disassemble and check the injection pump to locate the cause of the problem.

After reassembly of the fuel injection pump, check the injection timing.



1.

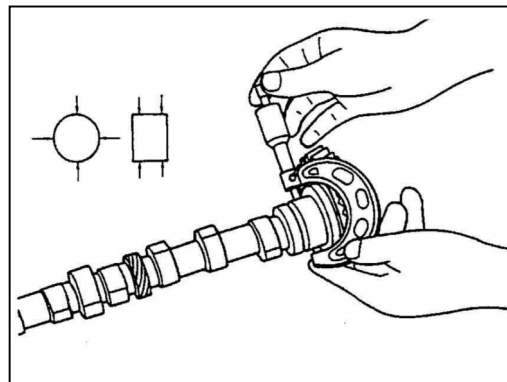


Inspection of the fuel injection pump camshaft

Inspection

Measure the lobe height and base circle as shown in the figure. Subtract the base circle from the lobe height to find the cam lift. If the cam lift exceeds the prescribed limit, renew the camshaft.

Item	Standard	Limit
Lobe height of fuel injection pump camshaft	44 mm (1.73 in)	43 mm (1.69 in)



1.

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