SEBM002400

SHOP MANUAL

KOMATSU®

72-2 SERIES 78-1 SERIES
75-2 SERIES 84-2 SERIES
DIESEL ENGINE

ENGINE APPLICATION

KOMATSU ENGINE MODEL	ENGINE MODEL IN THIS MANUAL	APPLICABLE MACHINE MODEL
3D72-2	3TNA72E-S	PC05-5, PC05-6 PC05-7,PC07-1
3D75-2	3TN75E-S	PC10-5, PC10-6
3D78-1	3TNC78E-VM	PC10-7
3D84-2	3TN84E-VM	PC25-1, PC30-7
3D84N-2	3TN84E-VM	PC15-3, PC20-7 JV40CW·C·CR·W-2
4D84-2	4TN84E-VM	PC40-7, PC45-1

★ This Shop Manual also contains information on engines other than the 72 Series, 75 Series, 78 Series and 84 Series engines.
Please use only the appropriate parts.

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Bosch type fuel injection pump is an in-line type pump with a governor incorporated.

A camshaft is built into the fuel injection pump, which has a drive cam for the fuel feed pump and tappet-drive cams for the plunger.

A timing gear and drive gear are mounted on the drive side of the camshaft, and a governor weight on the opposite side.

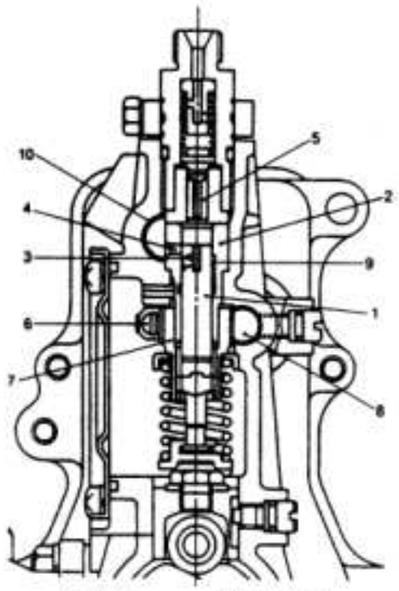
As the plunger rises, the fuel oil opens the delivery valve and goes through the high pressure pipe to the fuel injection nozzles.

When the control rack connected to the governor lever moves, the pinion turns the plunger. This changes the fuel discharge and intake positions and in turn controls the amount of fuel injected.

1-2 Fuel injection pump specifications

Type	YPFR	YPES-CL
Specifications	*See separate service data*	

1-3 Functioning of fuel injection pump



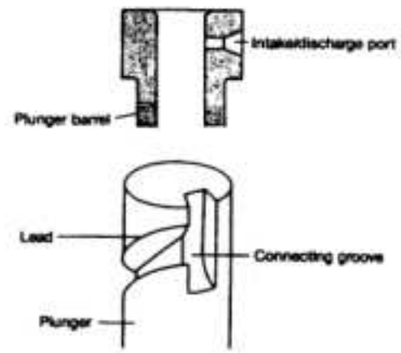
1. Plunger
2. Plunger barrel
3. Lead groove
4. Intake port
5. Delivery valve
6. Control sleeve
7. Control pinion
8. Control rack
9. Fuel leak return groove
10. Protector

The fuel injection pump supplies pressurized fuel to the injection nozzles through the action of the plunger. The plunger reciprocates in the plunger barrel through a fixed stroke and is lapped for a precise fit. A lead groove is helically cut in the plunger, and this leads to a connecting groove which goes to the top of the plunger.

There is a port in the plunger barrel which serves as both an intake and discharge port. The fuel comes through this port into the plunger chamber, is pressurized by the plunger, opens the delivery valve, flows to the fuel injection nozzle through the fuel injection pipe and is injected into the combustion chamber. Fuel injection terminates after the pressurized fuel has been discharged. This happens when the lead groove lines up with the discharge groove as the plunger rises and the pressure in the fuel injection pipe drops.

The control sleeve groove is fitted to the plunger flange. The control sleeve is secured to the control pinion and the pinion teeth and rack gear teeth are engaged.

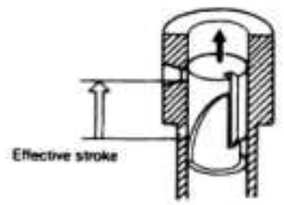
The plunger is controlled by the rack, enabling continuous changing of the volume of fuel injected from zero to maximum. A fuel leak return hole is provided in the plunger barrel. This returns fuel leaking from the gap between the plunger and the barrel to the fuel lines. This prevents dilution of the lubricant in the cam chamber.



1-4 Injection volume control

(1) Full injection volume position

When the rack is set at the maximum setting, fuel injection starts earlier. It occurs when the widest part of the lead groove on the upper part of plunger lines up with the intake port in the barrel. At this time, the nar-



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