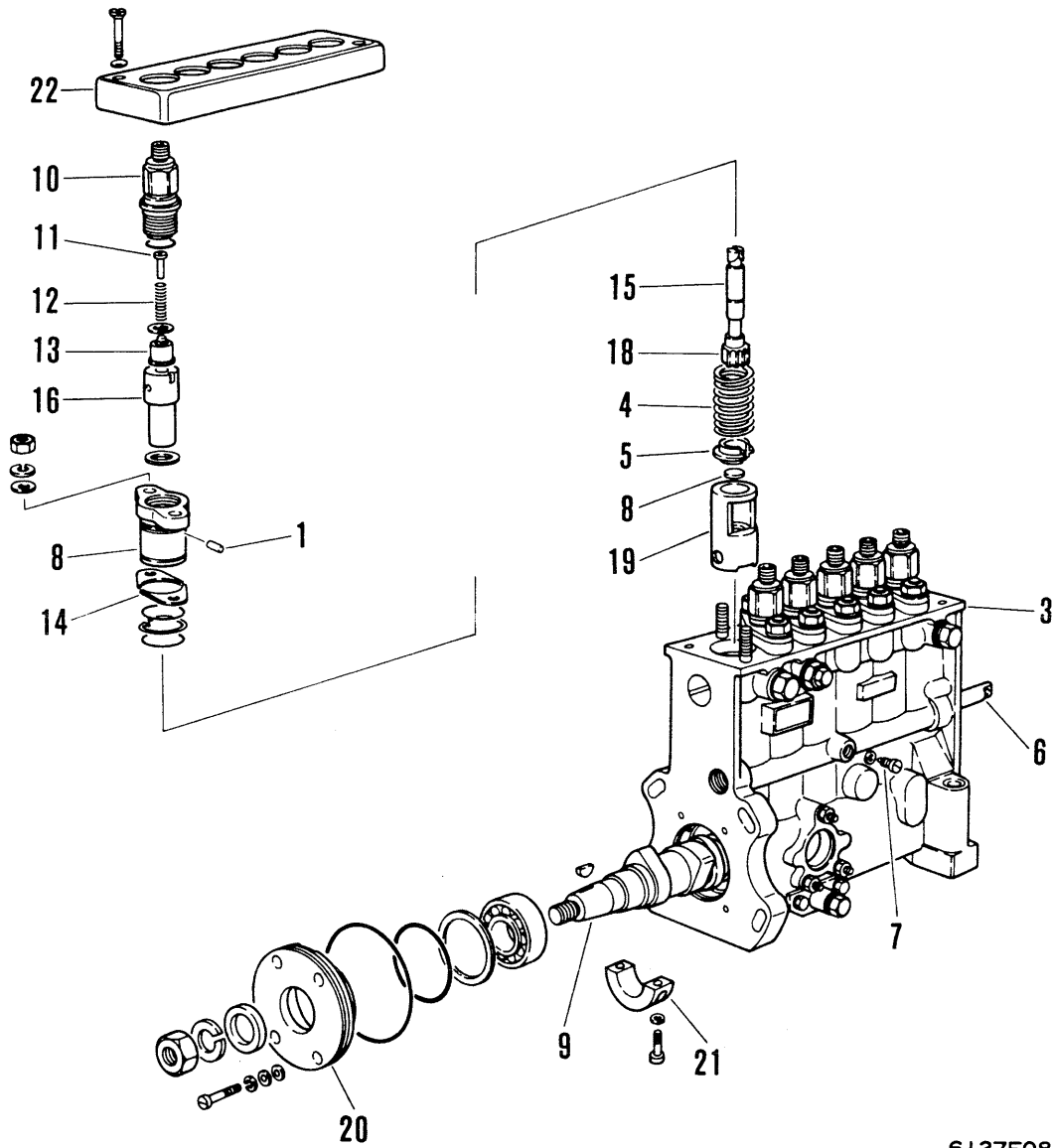


FUEL INJECTION PUMP

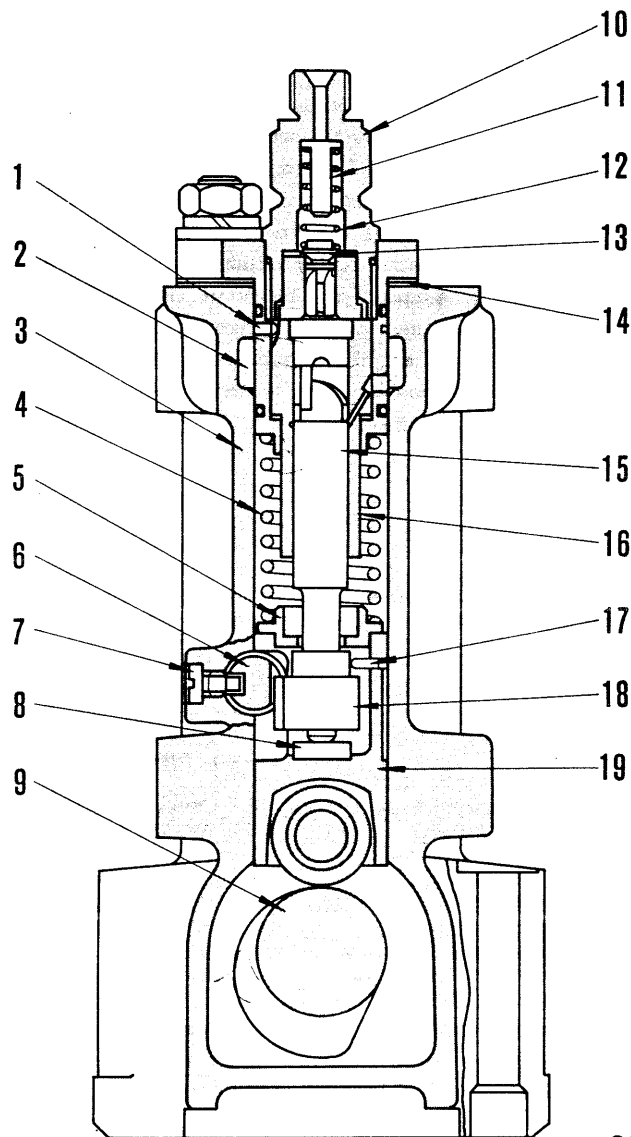
PUMP



6127F088

Fuel injection pump

- Type: Made by DIESEL KIKI
- Lubrication method: Forced lubrication with engine oil



1. Straight pin
2. Flange sleeve
3. Pump housing
4. Plunger spring
5. Lower spring seat
6. Control rack
7. Rack guide screw
8. Plunger seat
9. Camshaft
10. Delivery valve holder
11. Delivery valve stopper
12. Delivery valve spring
13. Delivery valve
14. Adjust shim
15. Plunger
16. Plunger barrel
17. Guide pin
18. Control pinion
19. Tappet
20. Cover
21. Center metal
22. Cover

6127F087

1. Outline

Refer to Fig. in which the injection pump is shown in a transverse cutaway view with one of the plunger pump elements exposed for identification of parts.

The subject injection pump is of Type PES-PD, which has been developed specially for direct-injection diesel engines. Many new features are adopted in this pump design, including stronger structural parts for allowing a much higher injection pressure to be generated, provisions for minimizing internal leakage of oil and for permitting high-speed operation, and a cam profile characterized by a tangential uphill curve and an eccentric downhill curve.

The cover plate hitherto used on pumps of Types PE-A, -B and -Z is eliminated on this Type PES-PD injection pump, so that the pump body is a totally-enclosing housing.

Each individual pumping element is built in the form of a block assembly. The plunger, delivery valve, spring, etc., are retained within the flange sleeve by the delivery-valve holder. These parts constitute the block assembly.

The barrel is positioned by means of a straight pin located at the middle peripheral portion of the flange sleeve, and the guide groove provided in the top end of the barrel. The block assembly, constructed as above, is secured in place by stud bolts, nuts and washers, which hold down the flange (of the flange sleeve) to the top of the pump housing.

Shims are used between the flange and the pump housing. Changing the shim thickness changes the position of the plunger relative to the inlet port provided in the barrel. In other words, vertical positional adjustment of the block assembly is to be effected by means of the shims.

The block assembly in place can be angularly repositioned, relative to the pump housing, by turning the flange sleeve. Turning the block affects the injection timing. Thus, the relationship between the plunger and the inlet port is determined by the angular and vertical positions of the block assembly in the housing.

The pressure-feed lubrication mentioned previously refers to the tappets. Pressurized lubricating oil is led into the pump housing from the engine lubricating system. An oil orifice opens out into the bore in which the tappet reciprocates in sliding contact. The oil is forced through the orifice into this sliding clearance around the tappet. The camshaft and the moving parts in the governor are lubricated with this oil. A return line is provided to return the oil back to the engine lubricating system.

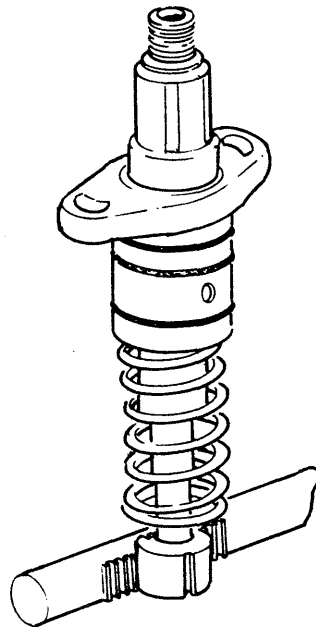
In order to minimize leakage of fuel oil along the plunger, each barrel is provided with an angular groove in its bore, and an oilway is machined out through the wall of the barrel to communicate the angular groove to the fuel oil suction chamber. This oilway is slanted.

The flange sleeve has an O-ring on its periphery.

This ring seals the fit of the sleeve in the housing to prevent fuel oil from leaking from the suction chamber into the camshaft chamber.

A new type gasket is used in the delivery valve section. It is a semi-metal gasket, mainly phosphor bronze in material. An O-ring is fitted to the holder to seal the fit of the holder in the sleeve. There are other O-rings and gaskets in the plunger block assembly, presenting tight joints for prevention of leakage of low- and high-pressure fuel oil.

The mechanism for varying the injection quantity is practically the same in design as those in Types PE-A, -B and -Z injection pumps hitherto used, except for the manner of meshing the control rack teeth with gear teeth. As shown in Fig. the bottom end of the plunger has a sector pinion gear, which is an integral part of the plunger. The teeth of this sector gear are directly engaged with the control rack. Because of this design feature, the control rack is located at a lower elevation as compared to its position in the pumps of Types PE-A, -B and -Z.



In this Type PES-PD injection pump, the plunger block assembly and the tappet assembly can be removed by taking them out of the housing top. The camshaft remains behind and is to be taken out through the end of the pump housing.

There are no plugs in the housing bottom, as in the older models. The pump housing is an oil-tight enclosure by itself.