- Simplified system - installationwise, maintenancewise.
- Robust and flexible system which is unaffected by single failing injectors.
- Possibility of optimising spray/lubricating oil amount at each individual injector, and thereby possibility of an integrated optimisation (not too little and not too much, respectively) at the individual injectors as opposed to previous systems where all injectors were evenly distributed.

Description of the Drawing

The invention will now be explained more closely with reference to the accompanying drawing, where:

Fig. 1 shows a schematic drawing of a dosing system using an injector according to the invention;

Fig. 2.1 shows further embodiment of a system using an injector according to the invention;

Fig. 2.2 shows a detail of the system shown in Fig. 2;

Fig. 3 shows further embodiment of a system using an injector according to the invention;

Fig. 4 shows detailed views of an injector according to the invention; and

Fig. 5 shows an alternative embodiment of an injector according to the invention.

Detailed Description of the Invention

Figure 1 shows a complete lubricating system for N cylinders 1. Each cylinder is equipped with a number of X injectors 2 which are connected to a common lubricating oil supply line 31 having a constant supply pressure, e.g. in the magnitude 30 - 100 bars. The supply pressure is delivered by a hydraulic pump unit 10 which is supplied from the day tank 1000.

The pump station 10 includes two pumps 11, two filters 12 and two check valves 13 preventing the lubricating oil from running back through a still-standing pump 11. The pump station also includes two shut-off valves 14 that are inserted in the supply line 34 so that the filters 12 can be cleaned during operation. The two pumps 11 are stand-by for each other and start up automatically in case of a drop in oil pressure.

In principle, it is also possible with e.g. two or more injector local control boxes each controlling all injectors for one cylinder and independently of all others. If this is combined with a monitoring function in the active injector local control box 101, a redundant system can be built up where the succeeding injector is instructed to take over, e.g. via a relay access and a cable, due to error in a preceding injector. Finally, the injector local control box could be made to trigger an alarm when it fails when the preceding injector is failing at the same time.

Figure 4 shows an injector as can be used in a system of the above mentioned type. On the Figure is shown that each cylinder 1 has a number of injectors 2 (four are shown per cylinder on the drawing). Pressurised oil is supplied through the branch pipe 21 to the injector 2 through supply channel 20100.

The injector shown in Figures 4 and 5 includes a nozzle 1001 which via an external screw thread is mounted in an internal valve housing 1006. The valve housing 1006 itself has a flange that partially rests upon the injector housing 1017 itself and partially upon an assembly flange 1007. The injector housing 1017 is fitted externally of the assembly of nozzle 1001 and valve housing 1006, and where the injector housing 1017 is mounted in a flange, e.g. by an interference fit. At the top, the internal valve housing 1006 consists of a flange with an O-ring groove and a subsequent turning that makes the valve housing 1006 continue a length up into the solenoid core/armature housing 1009. The O-ring 1008 ensures that the pressurised oil remains within valve housing 1006 and solenoid core/armature housing 1009. Around solenoid core/armature housing 1009 is provided a main flange 1010 which via screws 1011 clamps injector housing with nozzle, solenoid core/armature housing 1009 and assembly flange 1007. The nozzle/valve housing assembly 1001/1006 is located in the injector housing and by means of an O-ring 1002 it is ensured that no dirt or oil residues enter farther up in the injector housing 1017.

In the solenoid core/armature housing 1009 is located an armature/piston 1012 with an internal screw thread where the valve body 1003 is mounted, and where the threaded joint is secured by a pointed screw 1013. In the armature 1012 there are some

- Simplified system - installationwise, maintenancewise.
- Robust and flexible system which is unaffected by single failing injectors.
- Possibility of optimising spray/lubricating oil amount at each individual injector, and thereby possibility of an integrated optimisation (not too little and not too much, respectively) at the individual injectors as opposed to previous systems where all injectors were evenly distributed.

Description of the Drawing

The invention will now be explained more closely with reference to the accompanying drawing, where:

Fig. 1 shows a schematic drawing of a dosing system using an injector according to the invention;

Fig. 2.1 shows further embodiment of a system using an injector according to the invention;

Fig. 2.2 shows a detail of the system shown in Fig. 2;

Fig. 3 shows further embodiment of a system using an injector according to the invention;

Fig. 4.1 and 4.2 shows detailed views of an injector according to the invention; and

Fig. 5 shows an alternative embodiment of an injector according to the invention.

Detailed Description of the Invention

Figure 1 shows a complete lubricating system for N cylinders 1. Each cylinder is equipped with a number of X injectors 2 which are connected to a common lubricating oil supply line 31 having a constant supply pressure, e.g. in the magnitude 30 - 100 bars. The supply pressure is delivered by a hydraulic pump unit 10 which is supplied from the day tank 1000.

The pump station 10 includes two pumps 11, two filters 12 and two check valves 13 preventing the lubricating oil from running back through a still-standing pump 11. The pump station also includes two shut-off valves 14 that are inserted in the supply line 34 so that the filters 12 can be cleaned during operation. The two pumps 11 are stand-by for each other and start up automatically in case of a drop in oil pressure.

In principle, it is also possible with e.g. two or more injector local control boxes each controlling all injectors for one cylinder and independently of all others. If this is combined with a monitoring function in the active injector local control box 101, a redundant system can be built up where the succeeding injector is instructed to take over, e.g. via a relay access and a cable, due to error in a preceding injector. Finally, the injector local control box could be made to trigger an alarm when it fails when the preceding injector is failing at the same time.

Figure 4.1 and 4.2 show an injector as can be used in a system of the above mentioned type. Pressurised oil is supplied through the branch pipe 21 (see Fig 2.1 and 3) to the injector 2 through supply channel 20100.

The injector shown in Figures 4 and 5 includes a nozzle 1001 which via an external screw thread is mounted in an internal valve housing 1006. The valve housing 1006 itself has a flange that partially rests upon the injector housing 1017 itself and partially upon an assembly flange 1007. The injector housing 1017 is fitted externally of the assembly of nozzle 1001 and valve housing 1006, and where the injector housing 1017 is mounted in a flange, e.g. by an interference fit. At the top, the internal valve housing 1006 consists of a flange with an O-ring groove and a subsequent turning that makes the valve housing 1006 continue a length up into the solenoid core/armature housing 1009. The O-ring 1008 ensures that the pressurised oil remains within valve housing 1006 and solenoid core/armature housing 1009. Around solenoid core/armature housing 1009 is provided a main flange 1010 which via screws 1011 clamps injector housing with nozzle, solenoid core/armature housing 1009 and assembly flange 1007. The nozzle/valve housing assembly 1001/1006 is located in the injector housing and by means of an O-ring 1002 it is ensured that no dirt or oil residues enter farther up in the injector housing 1017.

In the solenoid core/armature housing 1009 is located an armature/piston 1012 with an internal screw thread where the valve body 1003 is mounted, and where the threaded joint is secured by a pointed screw 1013. In the armature 1012 there are some