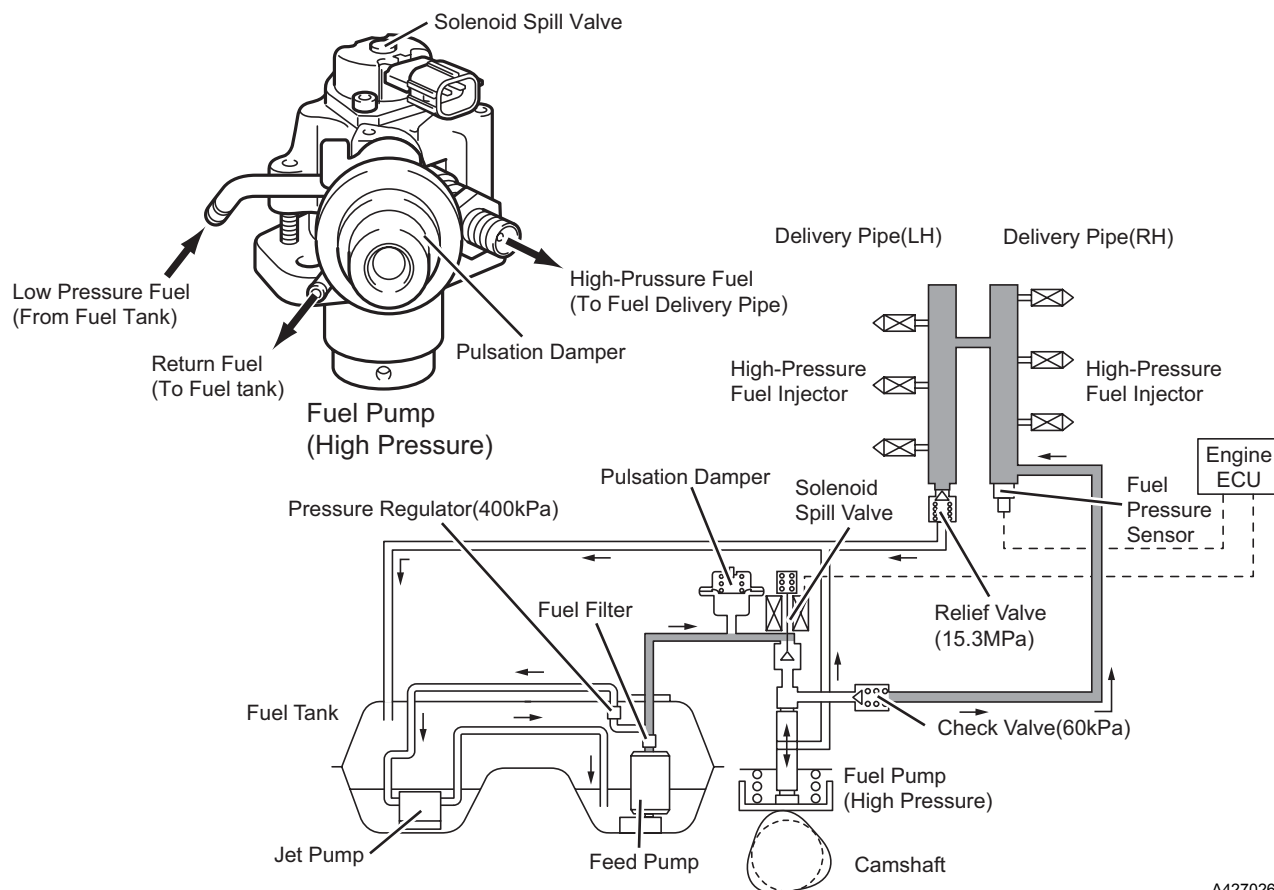


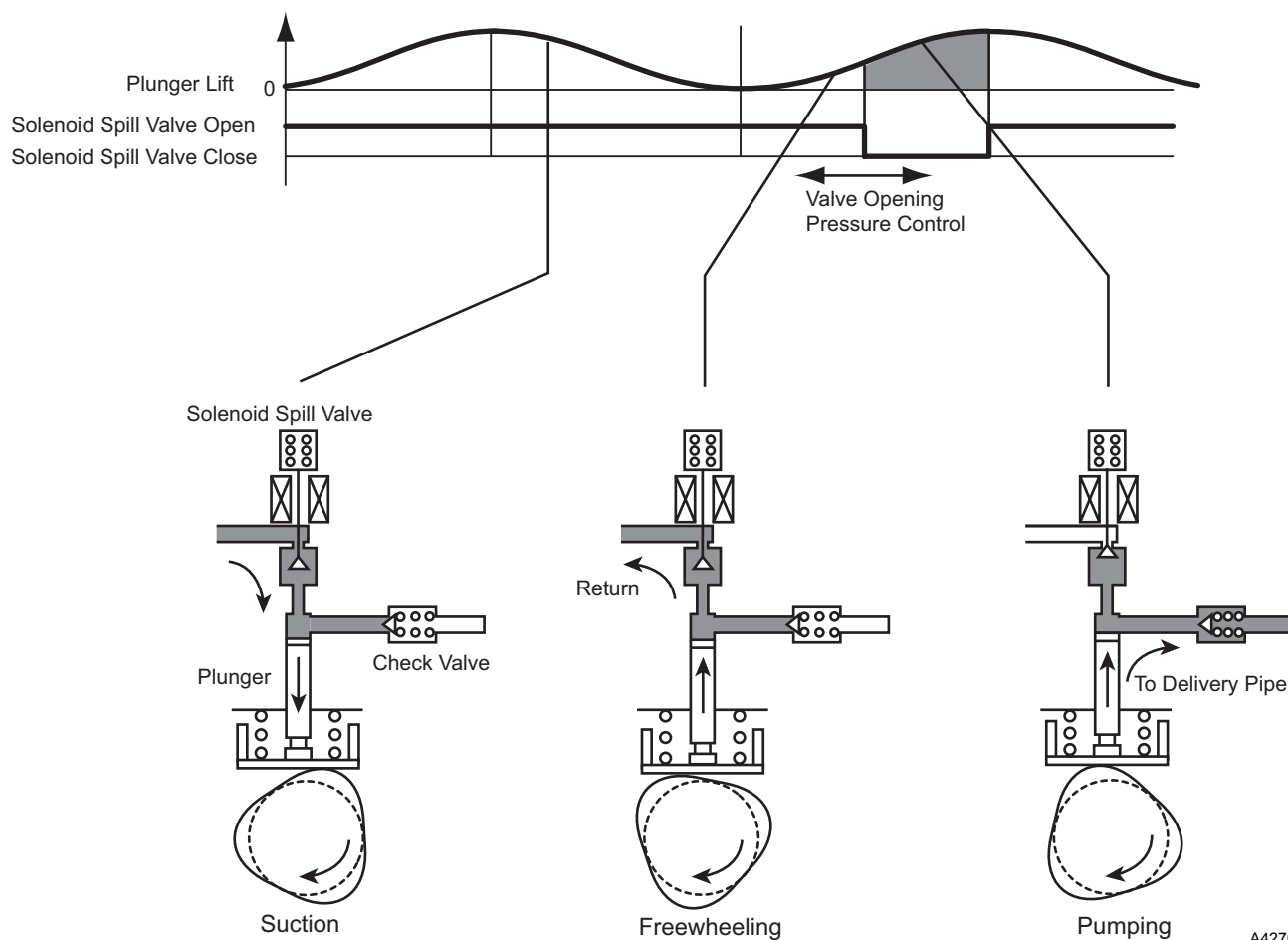
Fuel Pump (High Pressure)

- This fuel pump is a highly efficient, single-plunger type in which the drive torque has been reduced. In addition, a solenoid spill valve and a check valve have been integrated to achieve a lightweight and compact system. Also, a pulsation damper has been installed at the low-pressure fuel inlet.
- Mounted on the cylinder head cover, this fuel pump is driven by a cam that is provided at the rear end of the exhaust camshaft on the right bank of the engine. A heat insulator is provided on the surface of the fuel pump that mounts to the cylinder head cover in order to suppress the increase in fuel temperature.
- The engine ECU variably controls the fuel to a high-pressure that suits the driving conditions. Because this system uses a solenoid spill valve to control and discharge only the necessary volume of fuel, the drive torque and noise have been reduced.
- A fuel pressure sensor, which is provided in the fuel delivery pipe, gives feedback to the engine ECU in order to maintain an optimal fuel pressure at all times. This system varies the high fuel pressure between 4 and 13 MPa to suit the driving conditions, in order to reduce friction loss.
- A tapered seal metal joint is used for joining the high-pressure fuel delivery pipes.
- It consists of a solenoid spill valve that regulates the discharge volume of high-pressure fuel, a plunger that is driven by the camshaft and pressurizes fuel, and a check valve that mechanically opens and closes the passage to the fuel delivery pipe.
- A pulsation damper is provided at the low-pressure fuel inlet from the fuel tank, in order to reduce the pulsation of fuel.



High Pressure Fuel Pump Operation

- The plunger in the pump moves up and down to pressurize fuel. The solenoid spill valve, which is provided at the suction side of the pump, closes at an optimal timing during the compression stroke in order to control the fuel to the required pressure and volume. If the solenoid spill valve closes at an early timing, the effective stroke of the plunger becomes longer, thus pressurizing the fuel to an even higher pressure.
- The fuel that has been pressurized by the plunger pushes open the check valve (60 kPa), flows into the fuel delivery pipe, and is controlled to a pressure between 4 and 13 MPa (approximately 40 to 130 bars).
- The fuel pressure sensor that is provided on the fuel delivery pipe detects the fuel pressure and gives feedback to the engine ECU, enabling the engine ECU to control the fuel to a target pressure.



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