Working principle of pilot energy storage valve for excavators

What is a hydraulic excavator energy saving system?

In order to address these issues,a hydraulic excavator energy saving system based on a three-chamber accumulatoris proposed. Firstly,the conventional piston-type hydraulic accumulator is integrated with the hydraulic cylinder to form a three-chamber accumulator,which has a pressurizing function during energy storage.

Why are Pilot valves important in a solenoid-operated system?

Integration with Solenoids: Even in solenoid-operated systems,pilot valves are beneficial because they reduce the size and power requirements of the solenoid needed to control high-pressure systems. Pilot valves are valves that can control high flows in a system. Mostly the pilot actuated valves are shifted by the pressurized fluids.

Can a hydraulic excavator save energy?

Then,a hydraulic excavator energy saving system based on three-chamber accumulator is proposed,which can store and reuse the energy loss from throttling and overflow of the hydraulic system without changing the hydraulic system of the excavator.

What are the advantages of a pilot valve?

Its main advantages include: Reduced effort:Pilot valves use a small control pressure to operate larger valves or actuators,reducing the need for manual or electrical force. Efficiency: They are energy efficient,as they only require a small control input to manage large systems.

How does a pilot valve work?

The operation of the pilot valve takes place in two stages in the first one which is the pilot stage. In the pilot stage, a small spring-biased relief valve would control the main valve. The other stage is the balanced piston stage and in this, the hydraulic connections are made, so a balance piston is used for the diversion of full flow volume.

What is a pilot operated valve?

Pilot operated valves can be mounted in any remote location to which the pressure fluids can be piped. In this valve,there won't be any spark or increase of heat and because of this,it can be used for flammable environments. A pilot valve can decrease the pressure in a system. Flow control can be achieved by using a pilot valve.

The mode switching valve can realize two modes of the excavator, "normal" and "kinetic energy recovery". In the "normal" mode, the working principle of the system is the same as that of the ...

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