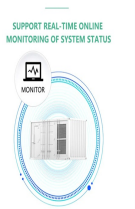
EXCAVATOR PILOT ENERGY STORAGE VALVE



The invention discloses an excavator big arm potential energy reuse system. The excavator big arm potential energy reuse system comprises an energy storage device oil way, a big arm rodless cavity oil way and a master control valve big arm rodless cavity oil way; a two-position five-way electromagnetic direction-changing valve is additionally


Figure 1 depicts the slewing energy-saving system of hydraulic hybrid excavators, comprising the main pump, main valve, hydraulic motor, high-pressure accumulator, low-pressure accumulator, and other components. The operator adjusts the pilot pressure at the main valve by manipulating the operation joystick, then regulates the oil flow of the main ???


The spool in a pilot-operated, pressure-reducing valve is balanced hydraulically by downstream pressure at both ends (Fig. 4). A light spring holds the valve open. A small pilot relief valve, usually built into the main valve body, relieves fluid to tank when reduced pressure reaches the pilot valve's spring setting.


Relief valves are widely used in industrial machinery. Due to the outlet of the relief valve being connected to the tank, the pressure drop of the relief valve is frequently equal to the inlet pressure. Accordingly, the energy loss of the relief valve is very high in some cases and this will worsen with an increase in the rated pressure of the hydraulic system. In order to overcome ???


Pilot oil flows from manifold (5) to port (9) of pilot control valve (3) . The pilot oil at port (9) flows into passage (10) . When pedal (2) is depressed forward, rod (11) and seat (12) are pushed down against the force of springs (13) and (14) .

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The multiway valve is the core control element of the hydraulic system in construction machinery, such as excavators. Its complex internal structure, especially the flow channels, significantly impacts the machine's efficiency and reliability. This study focuses on the boom flow channel of excavator multiway valves and establishes a multi-physical field coupling ???

Yang proposed a hydraulic excavator energy storage system based on three-chamber accumulators that can reduce energy consumption by 44.9 % [11]. However, multiple hydraulic cylinders are still controlled by a traditional multi-way valve, leading to a ???

In order to improve the energy efficiency and dynamic of negative control swing systems of excavators, this paper proposes a technical scheme of adding two PRVs (pressure reducing valves) to main

The invention discloses a kind of hydraulic crawler excavator accumulator Energy release control device, comprise proportional control solenoid valve, electromagnetic valve, pilot handle, swing arm energy storage oil cylinder, described proportional control solenoid valve is connected with accumulator on the one hand, be connected with main valve on the other hand, described pilot ???

In order to improve the energy efficiency and dynamic of negative control swing systems of excavators, this paper proposes a technical scheme of adding two PRVs (pressure reducing valves) to main valve pilot control circuit, which can adjust main value opening arbitrarily according to the working condition. A pump-value compound control strategy was formulated ???

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As the boom of a hydraulic excavator drops, the potential energy accumulated during the lifting process is converted into thermal energy and dissipated through the throttling action of the hydraulic valve, leading to excessive fuel consumption and serious energy waste. In order to address these issues, a hydraulic excavator energy saving system based on a three ???

An electrical hydraulic control system (electro-hydraulic system) is thought to be a key component in excavator operation systems. Control methods with fixed parameters may not yield optimal system performances because a hydraulic system has various nonlinear uncertainties due to the leakage and compressibility of the fluid medium. Hence, a novel PID ???

2. Katup Kontrol Pilot (Pilot Control Valve) Dalam hirarki katup kontrol excavator, katup kontrol pilot (PCV) berperan sebagai penerjemah handal, menerima bisikan halus dari operator melalui joystick dan menerjemahkannya menjadi instruksi yang presisi untuk katup kontrol utama (MCV). Fungsi yang Vital dan Presisi: PCV memiliki peran penting dalam:

The invention discloses a rotary energy saving system of a hydraulic excavator. The rotary energy saving system comprises a two-position four-way reversing valve, an energy storage unit, a three-position four-way hydraulic control reversing valve, an air storage cylinder and two one-way valves. Outlets of the two one-way valves are connected with a lower chamber of the energy ???

Energy conservation and emission reduction of construction machinery are the focus of current research. The traditional excavator, whose hydraulic pump is driven by the engine, has high fuel consumption and emissions. Furthermore, it is difficult to match the working point of the engine to that of the hydraulic pump. Current pure electric drive technology has the advantages of zero ???

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The global energy crisis and growing environmental concerns provide a strong impetus for the development of fuel-efficient hydraulic excavators (HEs). The boom potential energy of a conventional

I recently picked up a Scat Trak 530 mini excavator with pilot controls. The machine runs great but has hydraulic control problems. The problem is the boom, bucket, and crowd operations are slow or barely work, unless you operate a function on the opposite joystick at the same time.

With reference to accompanying drawing 1-2, a kind of hydraulic crawler excavator accumulator Energy release control device, comprises solenoid-operated proportional control valve 8, electromagnetic valve 2, pilot handle 9, swing arm energy storage oil cylinder 7, and described solenoid-operated proportional control valve is threaded connection

308C CR Excavator Hydraulic System ??? Pilot Valve (Joystick) Illustration 1: g00871337: Pilot control valve (boom and bucket) Illustration 2: g00871338: Main control valve compartment (top view) The storage box is removed for clarity. (3) Pilot line for boom I (BOOM LOWER) (4) Pilot line (BUCKET CLOSE) Pilot control valve (1) and pilot

energy saving of excavators [3]-[4]. The mode that a single pump provides hydraulic oil for multiple actuators is widely characteristics of main valve pilot circuit can be ignored.

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Key Points: Control Mechanism: The pilot valve uses a small feed to control the operation of a larger valve, which in turn manages the high-pressure or high-flow system.; Advantages: By using a pilot valve, a system can be controlled with minimal effort or force eliminates the need for large actuators to operate high-pressure systems. Applications: Pilot ???


Download scientific diagram | Pilot-operated check valve schematic from publication: Adaptive Robust Motion Control of an Excavator Hydraulic Hybrid Swing Drive | Over the last decade, a number of


In order to obtain the excavator's accurate energy flow, the excavator components'' performance and operating data requirements are obtained, and the experimental schemes are designed to


systems using hydraulic excavators, with the use of control valves and hydraulic accumulators to recover and reuse the swing braking energy (Shang et al., 2014; Hillman et al., 2016). Yu et al. established a hydraulic energy storage unit, pilot handle control system, hydraulic pump, and some necessary control valves. In the hydraulic en-


Reduction of costs Complex pilot control blocks lead to increased costs. If the pilot control system is supplied directly from the work hydraulics, a pressure-reducing valve is needed. The full operating pressure of up to 420 bar is applied to the primary connection of this valve. This means that the pilot control block has to be made from steel.

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In this paper, a novel series hybrid hydraulic excavator based on electro-hydraulic composite energy storage, which provides the average power of the system through the diesel engine, and the

reversible energy storage component and avariable pump/motor as an energy conversion element. This scheme belongs to the excavator boom potential energy regeneration method. When the boom is lowered, the accumulator and the signal after detecting the boom rising pilot signal. The left solenoid valve is in the lower position, and the right

DOI: 10.1080/15567036.2024.2302006 Corpus ID: 267196175; Active power optimization control of speed closed-loop engine for energy saving in hydraulic excavator @article{Sun2024ActivePO, title={Active power optimization control of speed closed-loop engine for energy saving in hydraulic excavator}, author={Weiqi Sun and Yong Sang and Guoshuai Li and Weiwei Liu and Guofeng ???