

Causes of severe wear of hydraulic pump and improvement methods

When the excavator hydraulic pump is seriously worn, it has a fatal effect on the excavator, so the excavator must solve such problems in time. When troubleshooting the hydraulic pump of the excavator, look for the cause of the fault from the following three points:

(1) Check the internal leakage of the boom cylinder

The simplest method of repairing an excavator hydraulic pump is to raise the boom to see if it has a clear free fall. If the drop is obvious, remove the cylinder and check that the seal should be replaced if it is worn.

(2) Check the control valve

First clean the safety valve and check if the spool is worn. If it is worn, it should be replaced. If there is no change after the safety valve is installed, check the wear of the valve stem of the control valve. The clearance limit is generally 0.06MM. If the wear is serious, it should be replaced.

(3) Measuring the pressure of the hydraulic pump

If the pressure is low, the adjustment is made, and the pressure is still not adjusted, indicating that the hydraulic pump is seriously worn.

First, the main reasons why the boom can not be lifted are:

1. [Excavator hydraulic pump](#) is seriously worn

The pump leakage is severe at low speed operation; the pump pressure is slightly increased at high speed operation, but the volumetric efficiency is significantly reduced due to wear and internal leakage of the pump, and it is difficult to reach the rated pressure. The long-term operation of the hydraulic pump intensifies the wear and the oil temperature rises, thereby causing the wear of the hydraulic components and the aging and damage of the seals, the loss of the sealing ability, the deterioration of the hydraulic oil, and finally the failure.

2. Unreasonable selection of hydraulic components

The boom cylinder is 70/40 non-standard series, and the seals are also non-standard parts. The manufacturing cost is high and the seal replacement is inconvenient. The cylinder diameter of the boom cylinder is small, which will inevitably make the system set high pressure.

3. The hydraulic system design is unreasonable

The control valve and the full hydraulic steering gear are connected in series with a single pump. The safety valve is set to a pressure of 16 MPA, and the hydraulic pump has a rated working pressure of 16 MPA. Hydraulic pumps often work under full load or long-time overload (high pressure), and the

system has hydraulic shock, long-term oil change, hydraulic oil contamination, and the hydraulic pump wear is aggravated, causing the hydraulic pump casing to burst. Such a fault).

Second, improvement and effect

(1) Improve hydraulic system design

After many demonstrations, the hydraulic pump repair of the excavator finally adopts the advanced priority valve and the load sensing full hydraulic steering gear. The new system can preferentially distribute the flow according to the steering requirements, regardless of the load size and the steering wheel speed. The oil is sufficient, and the remaining part can be fully supplied to the working device circuit, thereby eliminating power loss due to excessive oil supply to the steering circuit, improving system efficiency and reducing the working pressure of the hydraulic pump. Reduce the severe wear of the excavator hydraulic pump.

(2) Optimized design of boom cylinder and hydraulic pump

Reduce system working pressure. Through optimization calculations, the boom cylinders use the standard series 80/4. The displacement of the hydraulic pump is increased from 10ML/R to 14ML/R, and the system setting pressure is 14MPA, which meets the lifting force and speed requirements of the boom cylinder.

(3) Strengthen daily inspection and maintenance

During the use, attention should also be paid to the correct use and maintenance of the excavator. Regularly add or replace hydraulic oil, maintain the cleanliness of the hydraulic oil, and strengthen daily inspection and maintenance. Avoid serious wear and tear on the [excavator hydraulic pump](#), so as to reduce the number of times the excavator hydraulic pump is repaired.