

p330 gear pumps common failures and their causes

In the operation of the hydraulic system, the gear pump as the core power unit, its abnormal conditions often directly affect the performance of the equipment. In this paper, for [p330 gear pump](#) “abnormal oil supply” and “oil seal flushing out” two types of typical failures, proposed targeted solutions.

1. Troubleshooting guide for abnormal oil supply

When there is an interruption in the oil supply to the hydraulic system, it is recommended that the following process be followed for troubleshooting:

(1) Steering Confirmation

When oil supply abnormality occurs during the commissioning stage of the equipment, the first direction of troubleshooting is to confirm whether the pump body is correctly steered. As the gear pump has a left and right rotation of the directional design features, if the direction of rotation is opposite to the calibration direction, the reverse pressure generated by the meshing gears will directly impact the oil seal sealing surface.

(2) Oil inlet system check

When confirming that the steering is correct, you need to focus on checking the oil inlet piping system:

Filter status: blocked oil suction filter will form a vacuum negative pressure, commonly manifested as suction hose collapse. It is recommended to use the filter precision $\geq 80\mu\text{m}$ filter element, and regular cleaning and replacement.

Pipeline airtightness: use foam testing agent to check the pipeline connections, especially the pump body suction port flange sealing surface.

Installation height: the oil suction height of the gear pump should be controlled within 500mm, plateau areas need to reduce the oil suction height by 10% for every 1000m of elevation.

(3) System pressure test

After excluding the above factors, the oil suction vacuum can be detected by the pressure gauge. Under normal working conditions, the vacuum pressure should be maintained in the range of -0.03 to -0.05MPa, and if it exceeds -0.08MPa, it indicates that there is a serious oil suction resistance.

2. Oil seal failure mechanism analysis

Abnormal damage to the oil seal is one of the typical failures of gear pumps, and its causes mainly involve the following three aspects:

(1) Steering error

This is the most direct damage factor. When the pump body is turned in the opposite direction to the design direction, the high-pressure oil will act directly on the skeleton oil seal. Thus the oil seal will be flushed out.

(2) Gear pump bearings are subjected to axial force. Generate axial force is often associated with the gear pump shaft extension end and the coupling sleeve is too tight, that is, the installation of the pump with a hammer hard hit or through the mounting screws hard pull and the pump shaft extension end forced into the coupling sleeve. This makes the pump shaft is subject to a backward axial force, when the pump shaft rotation, this backward axial force will force the pump internal wear. As the internal gear pump is relying on the gear end face and sleeve end face fit sealing, when its axial sealing end face wear is serious, the pump internal axial sealing will produce a certain gap, which results in the communication of high and low pressure oil cavities to make the

oil seal flushed out. This situation occurs more in the dump truck industry, mainly due to the non-standardized size of the coupling sleeve on the host.

3. Preventive maintenance strategy

- (1) Standardize the installation process
- (2) Establish monitoring system
- (3) Improve the design

Through systematic failure analysis and preventive maintenance, the failure rate of [p330 gear pump](#) can be reduced by more than 60%.

gear pump types

gear pump definition

industrial gear pump

gear hydraulic pump

gear pump characteristics