Troubleshooting of common faults of gear pumps

1, cause and elimination of vibration and noise.

(1) inhalation of air

(1) The pump body of CB-B type gear pump is directly contacted with the two end caps of the hard seal, if the flatness of the contact surface does not meet the requirements, the pump is easy to inhale air at work; Similarly, the end cap of the pump and the pressure cap are also directly contacted, air is also easy to intrude; if the pressure cap is plastic products, the south is damaged or because of temperature changes. Transformation and deformation will also cause severe air leakage. When the flatness of the pump body or the pump cover can not meet the prescribed requirements, it can be grinded back and forth on the flat plate with gold and steel sand according to the "8" curve, or it can be grinded on the surface grinder, so that the flatness does not exceed 5 micron, and it needs to ensure the perpendicularity of the plane and the hole requirements; for the pump cover and the pressure cover; Leakage can be sealed by epoxy resin and other adhesives.

(2), the skeleton of the pump shaft is usually sealed by the oil seal. If the spring of the clamped lip falls off, or the oil package is reversed, or the lip is pulled, aging, will make the back end of the oil seal is often in a negative pressure state and inhaled air, generally can replace the new oil seal to solve.

(3) If the oil in the tank is insufficient or the suction pipe is not inserted below the oil surface, the pump will inhale air. At this time, the oil should be added to the oil tank to the oil marking line; if the oil return pipe is exposed, sometimes the air will be recirculated into the system because of the instantaneous negative pressure in the system, so the oil return pipe should also be inserted below the oil surface.

(4) The installation position of the pump is too high from the oil surface, especially when the pump speed decreases, because the necessary vacuum in the pump suction chamber can not be guaranteed, resulting in insufficient oil absorption and air inhalation. At this time, the relative height between the pump and the oil surface should be adjusted to meet the prescribed requirements.

_The oil filter is blocked by dirt or its capacity is too small, resulting in increased oil absorption resistance and air inhalation; in addition, the inlet and outlet aperture is larger may also be brought into the air. At this time, the oil filter can be cleaned, or a larger capacity filter can be

selected. In this way, not only can the air be inhaled, but also the noise can be prevented.

(2) mechanical reasons

(1) the connection between the pump and the coupling causes vibration and noise due to improper requirements. The coupling should be adjusted according to the regulations.

(2) noise caused by wear and tear of gear and other components due to dirt entering the pump in the oil. The oil should be replaced, the filter should be strengthened, the pump should be disassembled, and the gear with severe wear must be repaired or replaced.

(3) Vibration and noise will occur when parts in the pump are damaged or worn seriously, such as large tooth profile error or pitch error, bad contact between two gears, high tooth surface roughness, excessive length of common normal, too small backlash, and the contact area between two meshing gears is not in the position of indexing circle. At this time, gears can be replaced or gear pairs are studied. At the same time, bearing needle roller cage damage, long and short shaft journal and needle wear and tear, etc., can lead to the bearing rotation is not smooth and produce mechanical noise, at this time the need to repair gear pumps, needle bearing replacement.

(4) The axial assembly clearance of the gear is too small; the sliding joint surface between the end face of the gear and the front and back cover fails to be carefully cleared because the gear burrs before assembly, so the joint surface is pulled and damaged when running, resulting in a large internal leakage, resulting in a reduction of output flow; dirt enters the pump and wedges into the clearance between the end face of the gear and the front and back cover. The surface can cause the high and low pressure cavity to be connected with the groove with radial drag, thus reducing the output flow. The following measures shall be adopted to repair the above circumstances. Dismantle the gear pump, increase the axial clearance, that is, grind the end face of the gear properly; use the surface grinder to grind the front and rear cover end face and the gear end face, and remove the burr on the gear teeth (can not chamfer); after the surface grinding, the depth of the front and rear cover of the unloading groove on the end face will change, should increase the width appropriately.

(3) other reasons

The high viscosity of the oil also produces noise. The proper viscosity of the oil must be selected.

2. Insufficient output flow.

(1) the high oil temperature will reduce the viscosity and increase the internal leakage, thus reducing the output flow of the pump. Measures should be taken to identify causes; for medium and high pressure gear pumps, check whether the sealing rings are damaged.

If the viscosity of the selected oil is too high or too low, the output flow of the pump will be reduced. The oil with qualified viscosity should be used.

(3) CB-B gear pump can not be reversed in general, such as reverse pump body, will cause pressure cavity and suction cavity partial short connection, so that its flow reduction or even can not suck oil. At this point, we should check the steering of the pump.

4. Engine speed is not enough, resulting in reduced flow. Reasons should be identified and excluded.

3. Poor rotation.

(1) axial clearance or radial clearance is too small. Re adjust and repair.

2. There is dirt in the pump. Disintegrate to remove foreign objects.

Incorrect assembly. The machining datum plane of the two pin holes of the gear pump is not the assembly datum plane. If the pin is punched in first, then the screw is tightened, the pump will not move. The right way is to turn the gear pump on the side, tighten the screws, and finally drill the pin hole and enter the pin.

4. The coaxial difference between the pump and the engine coupling. The coaxality should be guaranteed to be within 0.1mm.

The parts in the pump are not demagnetizing. All parts must be demagnetization before assembly.

The quality of the needle sleeve is not qualified or the needle is broken. Repair or replace.

The working oil outlet is blocked. Removal of foreign bodies.

4. Fever

1. All the causes of impeded rotation of the gear pump can lead to the heating of the gear pump, and the elimination method can also refer to its implementation.

2. Oil viscosity is too high or too low. Re select oil.

3. Serious friction between the side plate and the axle sleeve. Repair or replace.

4. High ambient temperature, small tank volume, and heat dissipation.