How to repair the failures of pneumatic hammer?

Pneumatic hammer failure generally includes the following situations:

I. The hammer rod piston strikes the upper cover of the working cylinder

The causes and solutions of hammer rod striking the upper cover of working cylinder are as follows:

1. **Cause**: The nut of the working cylinder head is loose or the sealing gasket of the upper cover is damaged, resulting in air leakage and insufficient gas pressure in the chamber.
   Solution: Tighten the nut or replace the gasket in time.
2. **Cause**: The steel ball of the steel ball check valve is not tightly connected with the hole of the seat, or the steel ball itself is not round or broken, resulting in air leakage.
   Solution: Replace new steel ball, new spring, etc.
3. **Cause**: The plug cover on the top surface of the piston is loose due to impact and vibration, so that air enters the hollow part of the hammer rod, resulting in insufficient gas pressure.
   Solution: Repair the plug in time, make the plug fit with the pneumatic hammer rod hole by interference pressure, and then rivet it flat.
4. **Cause**: There are sand holes, air holes and cracks on the top surface of the hammer rod piston, resulting in air leakage, which will also reduce the air pressure.
   Solution: It can be solved by repair welding.
5. **Cause**: Insufficient height from the upper airway to the top of the rigid cylinder will also lead to insufficient air pressure in the chamber.
   Solution: The gasket can be added at the top of the working cylinder.

II. The lifting of pneumatic hammer head is not high

The proper lifting position is generally that the working surface of the upper anvil block is higher than the lower surface of the hammer head guide sleeve and cannot be lower than the hammer head guide sleeve.

The main reasons for the low lifting of hammer head are as follows:

1. The air pressure supplied from the lower chamber of the compression cylinder is low and can not meet the working requirements, so the hammer head cannot be pushed up.
2. The leakage of compressed gas is mainly caused by the wear of the cylinder wall of the pneumatic hammer, which makes the gas leak from the lower chamber of the compression chamber cylinder to the upper chamber, or makes the guide sleeve leak outward, or from the steel ball check valve in the rotary valve.
3. When the guide sleeve of the working cylinder is skewed, the lower part of the hammer rod is upset, and the inclined wedge of the upper anvil exits, the pneumatic hammer head will not be lifted high.

III. The hammer head of the pneumatic hammer can not fall after rising or the striking energy is insufficient

the hammer head wants to fall rapidly, the gas pressure at the upper part of the piston plus the weight of the falling part must be overcome and far greater than the resistance and friction of the gas at the lower part of the piston. Therefore, the reason why the hammer head does not drop or has weak impact is related to the gas pressure at the upper part of the piston, the gas resistance at the lower part of the piston and the friction force. The analysis is as follows:

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1. The gas pressure on the upper part of the piston is too small (for example, the airway is blocked, the air leakage of the upper rotary valve, etc.), so that the air pressure of the hammer piston is insufficient and the hammer head is weak.
2. If the resistance at the lower part of the piston is too large (such as the dislocation of the rotary valve, making the opening of the airway small or not open, etc.), the lower gas flow channel is not smooth or blocked, which will reduce the striking force or the hammer head will not fall down.
3. If the friction is too large, such as the hammer rod is upset, although the hammer head is lifted, it may not fall down if it is stuck. Another example is that the expanding ring of the working piston is broken, the broken part pops up, is inserted into the air inlet, and the hammer head may not fall down. In addition, it is also possible that the inclined wedge of the upper anvil comes out and the hammer head cannot come down.

IV. The air hammer head guide sleeve bolt is broken

the stud bolt connecting the hammer head guide sleeve and the working cylinder is broken is because the nut is loose, resulting in uneven stress on the bolt, or is because the anvil sinking or the height of the upper and lower anvil blocks is not enough, so that the working piston directly hits the guide sleeve.

V. The Hammer rod breakage and upsetting

Most of the broken parts of hammer rod are in the upper part of hammer rod, while most of the upsetting parts of hammer rod are in the lower part. The cause of hammer rod fracture begins as a short and small crack and a small amount of upsetting. If it is continued to be used, the crack will continue to expand, so that the hammer rod cannot be used or cause fracture.

In order to avoid the above phenomena, attention should be paid to the following aspects:

1. Cold beating or eccentric striking shall be avoided during the operation of air hammer.
2. When replacing the hammer rod, the material shall be improved. Generally, 45 steel shall be used, and the heat treatment hardness hb220-250 shall be strictly controlled.
3. In order to prevent upsetting, when manufacturing a new hammer rod, the lower part of the hammer rod shall be pre grind with a taper of 1:200 (at position of 60-100 mm).

VI. The Abnormal sound in cylinder

Abnormal noise generated in the working cylinder and compression cylinder shall be eliminated in time, otherwise serious equipment accidents will be caused.

VII. The working cylinder of pneumatic hammer is seriously heated

It is abnormal that the working cylinder is seriously heated and exceeds the specified temperature (100 degrees).

The causes of serious heating of air hammer working cylinder are as follows:

1. The replaced piston ring fits too tightly or the lubrication system fails.
2. The hammer head has been suspended for too long.
3. Therefore, pay close attention to the temperature of the working cylinder to ensure that temperature of the working cylinder does not exceed 100 degrees.