Assembly Solution Solves Vexing Noise Issue

CCTY Bearing manufactures high-quality bearings and assemblies, as well as unique solutions for OEM partners.

"I want to say thank you! The design related analysis seems to make sense, and we will definitely keep those considerations in mind as the assembly improvements are put in place." - Design Engineer

Executive Summary

An industrial sweeper OEM was encountering a subtle noise variation within a fan assembly. The occasional noise vexed engineers so their design engineer reached out to CCTY Bearing for help.

After taking a detailed look at the bearings, shafts, prints of mating parts, and their assembly process, CCTY Bearing's engineers determined the assembly method would benefit with some minor adjustments.

The OEM was able to modify a few steps in their internal process to eliminate the noise without encountering added costs.

The Challenge

The fan assembly in an industrial sweeper generated noise in certain assemblies. The company's internal team concluded the bearing was the noise source.

CCTY Bearing's engineers determined that it was probable the noise was the result of raceway brinelling.

The Solution

Through a few data exchanges, part reviews and shared prints, CCTY's engineers considered a number of initial solutions based on the data including:

- Producing an installation sleeve and new press fixtures
- Improving surface finishes and chamfers
- Changing the bearing's internal clearance
- Improving assembly press fit

We focused on the process because it revealed the possibility of an occasional bearing not properly aligning with the shaft before getting pressed onto it. This misalignment made the press apply force on the bearing's outer ring until it aligned the inner ring with the shaft.

The axial press force transferred from the outer ring to the balls and then to the inner ring. This force was strong enough to brinell the bearing raceways. In effect, the press pressure created dents in the raceway. These dents resemble pot holes in a street – every time a ball rolled over the dent it made noise much like a car tire will when a pot hole is encountered.

CCTY Bearing's engineers drew a simple tool that the customer was able to make themselves. The tool ensures the bearing is properly aligned to the shaft before the press fit pressure is applied. And, adjustments were made to the press tool to only apply pressure to the inner ring.

"As a manufacturer with a solution-focused approach to customer service, CCTY Bearing provides the benefit of partnering with our client's engineers for an outside look at design challenges."

John Sweetwood
Strategic Sales Manager

The Results

The OEM was able to modify internal processes to eliminate the fan noise without encountering any significant added costs.

The CCTY Bearing solution proved to be:

- An improved assembly process that eliminated fan noise warrantee issues and internal quality assembly rejections
- A cost neutral solution
- A streamlined approach to assembly
- Increased qualified assembly percentage

The client is now able to manufacturer quiet fans consistently.