

## Retrofit Solutions Designed to Minimize Cost of Warranty Repairs

A major manufacturer of farm equipment discovered that the wheel-hub assembly seals on one of its most popular tractors were not surviving their warranty lives. Because there was such a large number of trucks in the field, the company needed a solution that would retrofit the existing equipment. So the company asked System Seals to engineer a better solution.

A tractor's front axle assembly encounters a barrage of severe contaminants, temperatures and a regular dose of mud that can quickly damage internal bearings. The rotary seal plays a critical role in excluding contaminants and maintaining the life of the warranty.

System Seals engineers first reviewed the wheel assembly to fully understand the application and then analyzed the current under-performing seal. An investigation of the current seal revealed a small, but unnecessary heel under the sealing lip, which was likely added to help in the molding of the seal. An FEA analysis showed that this heel was unintentionally contacting the internal assembly when under compression and deflection.

The deformation of the seal lip increased the potential for contamination. It also increased friction, resulting in premature seal wear. System Seals was able to determine the root cause of failure, which informed their engineers on how to design a replacement.

After reviewing all of their findings, System Seals designed a new double lip seal, made from the abrasion resistant MP03 H-Polyurethane material. The result was a highly effective seal with 100% reliability that worked well past the manufacturer's warranty.

This retrofit solution not only repaired this OEM's reputation, but also solved the issue of seal failure without requiring costly modification to existing equipment, or new production tractors.



### CHALLENGE

To custom design a retrofit sealing solution for a wheel hub assembly to correct wide-spread warranty claims.

### SOLUTION

A System Seals retrofit solution based on review of the old seal, FEA analysis and in-house testing.

### RESULT

A new hub assembly seal that retrofits existing equipment, long outlasts the OEM's warranty with zero wear or system contamination.