

Continuous Improvement Project Yields Big Savings for OEM Customer

The Challenge

An automotive OEM customer had been routinely purchasing a Torque Limiter Assembly from Southern Machine Works (SMW) that required a combination of OTS purchased components and custom-machined parts. From Figure 1, the inner gear [5] and outer gear [4], while each were OTS purchased parts, each had slow delivery times - often as long as 12 weeks. Further, our records showed that each time these gears were re-ordered, the vendor had increased the price. SMW's challenge was to continue to supply the completed Torque Limiter Assembly to our OEM customer at a fixed negotiated price – without any price increases. SMW decided to take on the task as an AS9100 continuous improvement project.

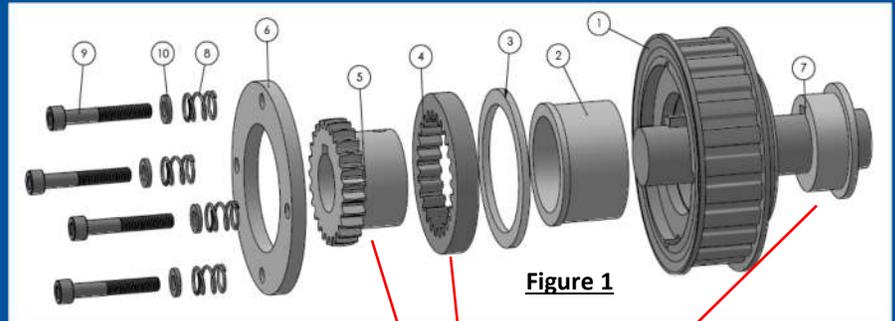


Figure 1

The Solution

The SMW team reviewed the overall design of the assembly to search for and identify cost-savings opportunities and a solution to the growing price increases of the gears. Next, our Quality Manager made a site visit to the OEM customer to better understand design intent and functionality of each component in the assembly. Through that working discussion, SMW and the customer realized that the Inner and Outer gear components were functionally “over-engineered”. They also found the Flange [7, Figure 1] could be eliminated with some other design changes to the assembly. Lastly, the assembly as a whole didn't offer a way to easily fine-tune the positioning relative to the mating parts at final assembly.

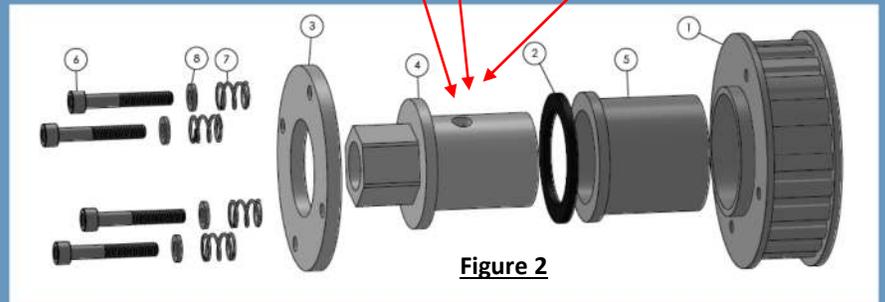


Figure 2

Having gained a thorough understanding of the application, SMW then analyzed the design to provide the customer with an alternative design solution which included a new Hex-Flange[4] design as shown in Figure 2. The final optimized design reduced the overall number of purchased components, as well as custom parts required to complete the assembly. The new Hex-Flange[4, Figure 2] was an additional custom-machined part, but the overall machining time for the entire assembly was decreased by over 30%; and the integrated hex nut allowed the assemblers to fine-tune the positioning at final assembly.

The new simplified design for the Pulley [1, Figure 2] decreased machining time by 70% and resulted in a significant cost savings over the original design. With the new design [Figure 2], we now machine the Pulley[1] on a Mazak QTN250 in one lathe operation and then press in the Bushing [5, figure 2]. The new design configuration also allowed SMW to purchase Bushings[5, Figure 2] and Friction Plates[2, Figure 2] that are standard OTS items and readily available from multiple vendors. This change resulted in decreased lead times on OTS purchased parts from 3 months to 2-3 days, and at more stable pricing.

The Results

With this new design configuration, SMW was able reduce the overall complexity of the assembly while still maintaining the required design functionality. Instead of waiting up to 12 weeks just to receive purchased components, SMW can now deliver a completed Torque Limiter Assembly to our OEM customer in 30 days or less. This joint and collaborative continuous improvement project realized an overall 50% cost reduction for our OEM customer.



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