

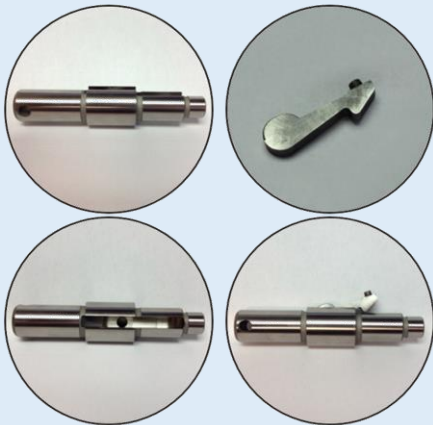


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At PFI Precision Machining, manufacturing close-tolerance stainless steel components is one of our core strengths. Through our years of continued focus on process improvements and lean manufacturing techniques, we have developed an exceptional understanding of all of the factors that influence the quality, productivity, and consistency of machining stainless steel in all of its various grades and tempers.

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Precision Managing: A Case Study

PRECISION MACHINING A COST SAVING REPLACEMENT PART FOR FIELD FAILURES

At PFI Precision, we are a lean organization with sharp skills for problem solving. Our disciplined, solutions-based approach allows us to help clients remediate issues that surface during any time in the product lifecycle.

A company in the food service industry approached us to help troubleshoot a problem with a shaft and key assembly. Field failures were costing them in excess of \$40,000 a year in repairs, and they needed help in pinpointing and correcting the deficiency that was compromising performance. They were also looking to develop a long-term manufacturing solution that would ensure the reliability and improve the service life of these two components. We assembled a team to do an in-depth analysis of the situation and develop an action plan to correct the root cause of the fault condition.

As an experienced manufacturer of precision, close-tolerance components, we have developed very systematic methodologies for achieving precise dimensional accuracy on mated mechanical parts that require a tight engineering fit. To resolve this issue, we designed a special grinding process for the blind keyway. This effort allowed us to uphold ± 0.0005 " tolerances, which ensured the proper clearances. We also took over production of the drive key. Investment casting allowed us to achieve a near net shape on the key, which was completed with a ground finish within the same ± 0.0005 " tolerance.

Materials of construction included 8620 steel, chosen for its excellent surface hardenability and good internal strength. Production involved turning and milling as well as numerous grinding passes to create a 16 RMA or better surface finish. Case hardening served to improve the wear resistance and toughen the core. When completed, the shaft measured 4.5" in length and the largest diameter was 0.9200" while the smallest diameter was 0.5000". Always very passionate about quality, we put a great deal of effort into ensuring that this assembly was dimensionally accurate and had an exceptional surface profile.

Although our production methods resulted in a slight increase in the cost of the components, the client achieved a net \$30,000 savings per year by avoiding the cost of field repairs and replacement parts. We ran this program at the rate of 20,000 units per year for a 10 year period, resulting in a total savings of \$300,000.

PRECISION MACHINING A COST SAVING REPLACEMENT PART FOR FIELD FAILURES

Project Name & Description	Precision Machining a Cost Saving Replacement Part for Field Failures
Capabilities Applied/Processes	CNC Turning CNC Milling Grinding Heat Treating
Equipment Used to Manufacture Part	CNC Lathe CNC Mill
Overall Part Dimensions	Under 1 inch in Diameter (1/2" - .920") 4 1/4" Long
Tightest Tolerances	-0.0005"
Material Used	8620 Steel
Material Finish	16 RMA or better
Industry for Use	Food Service
In Process Testing/Inspection Performed	Shadow Gauge Profilometer
Volume	20,000 Annually for 10 Years