Reducing Downtime Through Reverse Engineering:

A Case Study in Rapid Manufacturing Support.

Wagner Machine | Trainer, PA
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EXECUTIVE SUMMARY

When a major commercial bakery in the Mid-Atlantic faced a critical mechanical failure in one of its high-capacity ovens, the situation posed a serious operational threat. The original equipment manufacturer (OEM), located overseas, quoted a **four-month lead time** for a replacement part. With production lines halted, the bakery faced **significant financial losses** from prolonged downtime.

Wagner Machine, a precision machine shop located in **Trainer, PA**, was brought in to provide an immediate and local solution. Through collaboration with the bakery and its mechanical contractor, our team **reverse engineered and manufactured a custom steel sleeve bearing and aluminum housing**—all in just one week.

This case study highlights how Wagner Machine's rapid response capabilities, reverse engineering expertise, and strategic location in the Mid-Atlantic region help industrial clients **maximize uptime and avoid costly delays.**

THE PROBLEM:

Production at a Standstill

A commercial bakery's production line came to a sudden halt when a key mechanical assembly within its industrial oven failed. The malfunction was traced to a worn **steel sleeve bearing** and its **aluminum housing,** both critical components for the operation of the oven's rotating mechanism.

The OEM, based overseas, confirmed availability but offered a **delivery estimate of four months.** Given the continuous production requirements of the facility, such a delay was **not an option.**

Key Risks Included:

- Extended production downtime.
- Revenue loss and potential contract penalties
- Increased strain on other production assets
- Employee downtime and rescheduling

THE SOLUTION:

Reverse Engineering with Rapid Turnaround.

The bakery's mechanical contractor turned to **Wagner Machine** for a solution. With decades of experience in precision machining and part replication, our team was uniquely positioned to assist.

Phase 1: Assessment and Disassembly
The failed assembly was delivered to our shop.
Our engineers conducted a detailed inspection and material analysis.
Critical dimensions and tolerances were mapped using precision measuring tools.

Phase 2: Reverse Engineering
Using 3D CAD tools, we recreated the design of the original steel sleeve bearing and aluminum housing.
Adjustments were made to account for wear patterns and potential points of failure in the original design.

Phase 3: Manufacturing
High-grade steel and aluminum stock were sourced immediately.
Machining was completed using CNC lathes and mills within our facility.
The new parts were rigorously tested for fit, function, and durability.

Timeline: One Week

From intake to delivery, the entire process was completed in **just 7 days**, enabling the bakery to **resume full production 3.5 months ahead of schedule.**

RESULTS & VALUE DELIVERED

Downtime Avoided:

16 weeks of downtime reduced to 1 week.
Operations resumed with minimal disruption.

Cost Savings:

Avoided revenue loss from halted production.
Eliminated potential penalties from unfulfilled contracts.

Custom Solution:

Improved component durability based on root cause analysis.
Precision fit without OEM involvement.

Our Capabilities Include:

- Reverse engineering of obsolete or hard-to-source parts.
- CNC milling and turning
- Custom fabrication and welding
- Precision grinding and inspection

CONTACT US

Wagner Machine
A Division of Schmidt Industrial Services.

701 Chestnut Street, Trainer, PA 19061

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For any facility facing **OEM delays, discontinued parts, or mechanical emergencies,** Wagner Machine stands ready to respond.

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