Ford Romeo Engine
Cast Iron Engine Block Honing Operation
Increases Productivity & Reduces Scrap and Maintenance

The Most Advanced, Automatic, Non-Disposable Liquid Filtration System

ZERO GRAVITY FILTERS

Metalworking / Honing

Customer Challenge:

The cast iron block honing operation had a large, vacuum-type central filtration system. To help achieve oil cleanliness requirements, the central filtration system was equipped with a side-stream bar-type magnetic separator filtering the honing oil at a rate of 300 gpm.

The magnetic separator relied on motors, chain drives and a mechanical scraping mechanism to clean the magnetic tubes. The separator required excessive maintenance and experienced routine downtime. During downtimes, the honing oil was not effectively cleaned. The magnetic separator issues resulted in excessive commitment of the maintenance team, high scrap rates due to vertical scratches on the cylinder bores caused by particles in the oil and most importantly lost productivity of a high-volume engine block.

Ford wanted to implement a consistent and reliable technology that would maintain the hone oil at specified cleanliness level and minimize equipment maintenance.

Chart 1 – Hone Oil Contamination, ppm

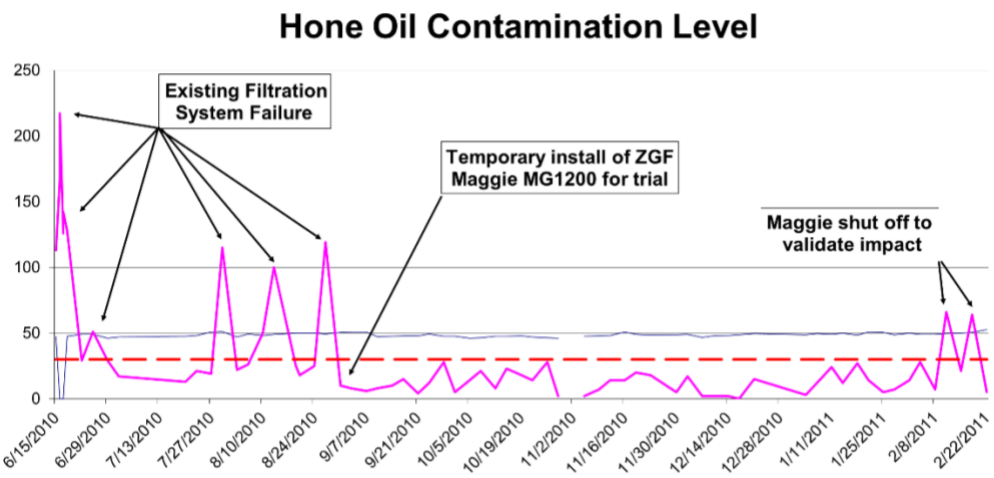

Table 1 - Trial Results

Category	Improvement	Duration	Savings
Labor	4 hours. / week	28 weeks	$51.59
Scrap Reduction	4 units / week	28 weeks	$248.00
Productivity Improvement	0.66 jobs / hour	28 weeks	$8,470
Total Savings (28-week trial period)			$42,024
Annual Savings			**$78,052**

Our Solution: Maggie

Maggie is a high-powered, fully automatic, innovative, and patented magnetic separator. To clean, Maggie simply uses plant air to shift magnets up and down inside a stainless-steel tube. By eliminating motors and scrapers, Maggie is a simple, effective, user-friendly technology that requires virtually no operator involvement or maintenance. ZGF offered Ford a trial unit to prove its technology.

The opportunity to install a trial unit arose when the existing magnetic separator was inoperable and in need of maintenance. On 31 August 2010, the existing bar-type magnetic separator was disconnected, and the test Maggie was installed.

For the trial, ZGF provided a Maggie MG1200 and Smart Drum PLUS fluid recovery system. The Maggie trial system was rated at 90 gpm on honing oil. This compared to a flow rate of 300 gpm for the existing bar-type magnetic separator.

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Maggie MG1200, 2-Station with Smart Drum PLUS (SD+) fluid recovery system rated at 180 gpm on Honing Oil

Maggie captures most particles 5 micron and larger, as well as sub-miron particles. SD+ recovers and returns the valuable honing oil to the process.

Results

- Maggie maintained the dirt level below 30 ppm upper control limit (red dashed line on Chart 1) 100% of the time.
- Validation: The Maggie was shutdown to validate the impact it was having on the process. When Maggie was offline, the dirt levels more doubled to ~75 ppm.
- During the 28-week trial, Maggie provided over $42,000 in savings due to an increase in productivity, a reduction in scrap and less manpower required for maintenance.
- The annualized savings are more than $78,000.
- **Ford purchased a 180 gpm Maggie system with a payback of well less than 1-year.**
- The Maggie system has a significantly smaller footprint than the bar-type magnetic separator and provided additional floor space for other uses.
- The Maggie has operated unattended requiring zero maintenance for over 5 years.