FILTERMAG

Simple  Easy  Obvious

+ Reduce Wear
+ Increase Reliability
+ Extend Equipment Life

= REDUCED COST OF OWNERSHIP

A Lifetime of Protection from a One Time Investment
Traditional Oil Filtration

Standard oil filters are comprised of:
- Metal canister
- Pleated paper filter element
- Holes for the oil to enter and exit

Oil circulates through the filter:
- Enters along the walls of the canister
- Flows through the paper filter element
- Exits out the center
Traditional Oil Filtration

Lubricating oil is very viscous
The paper filter element must be very porous in order to provide high oil flow rates
Standard filters have a porosity of 20-25 microns (µm)

Particles smaller than 20-25 µm
Pass through the paper filter
Flow back into the engine
Continue to circulate in the oil
Contamination Control Systems

Traditional Oil Filtration

Steel particles
  Principle particles created in an engine during normal wear
  Most are smaller than 20 µm

Oil lubricates the moving parts
  Steel particles in the oil are trapped between the lubricated surfaces
  Particles cause grinding wear
  More wear creates more particles
  Cycle continues and wear increases
FilterMag® Breaks the Wear Cycle

Simply snap a FilterMag® on the outside of a standard oil filter.

FilterMag’s powerful rare earth magnets attract and hold particles that would normally pass through the paper filter.

The RESULTS are obvious.
FilterMag® Breaks the Wear Cycle

The black rectangles on the inside of this oil filter are particles captured by a FilterMag after only 100 hours of operation on an Isuzu 4800 truck.

Most are less than 25µm

Too small to be seen individually

Millions of these wear causing particles align to form the outline of FilterMag’s powerful rare earth magnets.
FilterMag® Breaks the Wear Cycle

Removing most of the small wear causing particles can:

- Reduce engine wear up to 80%\(^1\)
- Increase reliability by 2 to 3 times\(^2\)
- Extend the life of lubricated parts up to 100%\(^2\)

Non-invasive patented technology means:

- No loss of oil flow
- No loss of oil pressure
- Completely re-usable

*Slide off of the old filter
Snap onto the new filter*

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1 - David R. Staley, General Motors Corp.
"Correlating Lube Oil Filtration Efficiencies With Engine Wear"
Society Of Automotive Engineers
Paper Number 881825, November 7, 1988

2 - Sayles, R.S. And Macpherson, P.B.,
"Influence of Wear Debris on Rolling Contact Fatigue"
Rolling Contact Fatigue of Bearing Steels, J.J.C. Hoo, editor
ASTM STP 771, ASTM 1982, pp. 255-274

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*Inside of an oil filter from a John Deere farm tractor*
Easy Installation...

- No tools needed
- No training required
- No effect on equipment warranty
Simple Size Selection

- 5 CT products for spin-on filters
- Select by the diameter of the filter
Simple Size Selection

- 5 CT products for spin-on filters
- Select by the diameter of the filter
- CT 9.0 for large fixed canister filters
Simple Size Selection

- 5 CT products for spin-on filters
- Select by the diameter of the filter
- CT9.0 for large fixed canister filters
- Specialty products

CTF 5.0
Transmissions

CTF 2.5
Fits Inside
Gear Boxes & Differentials

FILTERMAG
Contamination Control Systems
Contamination Control System
Our Patented Fundamentals

PARABOLIC FLUX FOCUS
- Orient magnetic flux into center of filter
- Housing made of DuPont™ Zytel®
- High temperature tolerance -100°F to +300°F.

EXTREME RARE EARTH MAGNETS
- Provides tractive force to remove particles from fluids under very harsh conditions:
  - Fluid temperatures to 300°F
  - Fluid pressures commonly 80 to 120psi. Up to 20,000psi for hydraulics
  - Flow rates up to 2,000 gallons/minute

FLUX AMPLIFIER & SHIELDING
- Redirects flux from exiting back of system to supplementing filter side of system
- Shielding STOPS ALL FLUX from exiting back of system and into engine compartment
- So effective a paperclip won’t stick to the exterior for the system
- Vehicle electronics stay safe
FilterMag Works On Practically All Vehicles & Equipment

- Off-road heavy equipment
- All sizes & types of trucks
- Engines, pumps, and compressors
- Generators, & marine vessels.
Completely Non-invasive Contamination Control

- Cut open filter from a diesel engine after 800 hours operation

- Contamination Control without ANY changes in:
  - Fluid flow paths
  - Fluid pressures
  - Fluid flow rates

- No re-plumbing of manufacturer’s:
  - Engine oil systems
  - Hydraulic systems

- NO warranty impact
Diesel Fuel Filtration

Diesel fuel is often contaminated with water

Water can create rust in the fuel system

Rust particles (iron oxide) may pass through a fuel filter

Rust particles cause unnecessary wear to the fuel pump and fuel injectors

FilterMag® can capture the rust particles that ordinary filters miss
Diesel Fuel Filtration

Extending the life of a fuel injection system will pay for the investment in FilterMag.

Fuel only passes through the filter one time.

Using 2 FilterMags in tandem is recommended for optimum results.

Diesel fuel is often contaminated with water.

Water can create rust in the fuel system.

Rust particles (iron oxide) may pass through a fuel filter.

Rust particles cause unnecessary wear to the fuel pump and fuel injectors.

FilterMag® can capture the rust particles that ordinary filters miss.
Normal wear in hydraulic systems creates microscopic steel particles in the hydraulic fluid.

When recirculated, these particles shorten the life of seals, valves and pumps thus reducing reliability.

FilterMag® CTR products insert into hydraulic fluid reservoir tanks to capture the particles.

Typically mounted to filler caps for ease of removal and cleaning.
Hydraulic Fluid Filtration

40 ton forklift at the Port of Los Angeles
CTR used in the hydraulic reservoir tank

Millions of microscopic steel particles captured by the magnets of the CTR
Simply wipe off and place back into the tank (< 5 min) No tools required
FilterMag® CT magnets may also be used with spin-on hydraulic filters
Cheap insurance for very expensive hydraulic systems
Kidney Loop Application
Reduce Wear, Increase Reliability & Extend Equipment Life

- **FilterMag** works with full flow oil, hydraulic & fuel filtration
  - Value based filtration removes particles ≥40 microns
  - Premium filtration removes particles ≥ 25 microns
  - FilterMag assisted filtration removes ferrous particle ≥ 1 micron

- Preserve higher quality (TBN) of oil during operation

- Reduce risk of failure
  - Engine
  - Fuel systems
  - Hydraulic systems
MacPherson Graph

Clean Oil is Essential to Life Extension & Improved Reliability

MacPherson proved that removal of very small particles (<10 micron) from lubricating oil has a very useful effect on the life of bearings: **The finer the filtration, the longer the life.**

The MacPherson Graph is based upon an accelerated test of 10 rolling element bearings. The oil was contaminated with particles from gearboxes.

# Noria Chart

## New Cleanliness Level (ISO Code)

<table>
<thead>
<tr>
<th>Hydraulics and Diesel Engines</th>
<th>Rolling Element Bearings</th>
<th>Gear Boxes and Other Machinery</th>
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- Machinery Lubrication “The Importance of ISO Cleanliness Codes”

[http://media.noria.com/sites/archive_images/Backup_200509_Contam-Tab2.gif](http://media.noria.com/sites/archive_images/Backup_200509_Contam-Tab2.gif)
What about particles that aren’t magnetic?

- Non-ferrous particles become positively charged while in magnetic field
  - Metals: Copper, Aluminum, Chromium, Sodium
  - Others: soot, silicates, Boron, Calcium

- Positively charged particles attracted & held to negatively charged inner wall of oil filter
The FilterMag® Promise

Reduce Wear
Increase Reliability
Extend Equipment Life

in

Most equipment with an oil filter
Diesel fuel systems
Hydraulic systems
Transmissions, Differentials & Gear Boxes
For further information please contact:

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