



Is it a Dirtbox or a Gearbox?

How to use Offline Filters to Rescue Dirty Gearboxes

by Justin Stover



BEFORE



AFTER



Dirty Gearboxes don't always have to be rebuilt, replaced or run to failure. Dirty Gearbox oil doesn't have to be disposed of. Leading OEM's and savvy End Users have found that filtering oil with highly efficient Offline Filters can double or triple gear oil life and extend Gearbox life by at least 50%.

Gearboxes are marvels of design and feats of human engineering. Gears and bearings ride on a thin film of oil invisible to the naked eye. The oil film that separates gear teeth is often only a few microns thick. So gears require fine filtration.

80%
of damage
done to a
Gearbox is
caused by
DIRT

Dirt is contamination. Dirt is inevitable. Dirt indents and abrades gear teeth, cutting gear life short. Where does the dirt come from? It is built-in during the manufacturing, assembly and run in process. Dirt is always a threat because it is internally generated, ingested and added during maintenance.

A Gearbox with 55 gallons of oil and a mere ½ teaspoon of fine dust will produce a particle count of about ISO 18/15/12. If the Gearbox ran eight hours per day at a circulation rate of 16 gallons of oil per minute, the gears would pass the equivalent of 25 pounds of dirt at the end of 200 days. If the oil measured ISO 20/17/14, the gears would eat 425 pounds of dirt during the same period. "Dirtboxes" generate more dirt and more wear.

The good news is that dirt can be controlled! Its effects can be minimized with proper intervention. Give your Gearbox a fighting chance by removing the dirt with Offline Filters.

What the Experts Say

"Offline filters provide fine filtration during operation and during shutdown. Once the oil is clean, it should stay clean provided the gearbox and lubrication system were properly designed and seals, breathers and maintenance are adequate."

Robert Errichello and Jane Muller, GEARTECH

"When dirt particles in lubricating oils are considered, it is obvious that the cleaner the oil the better it is. This means that it always pays to keep the dirt content in the lubricant as low as possible."

Bo O. Jacobson



FACT:

No Gearbox Has Ever Failed Because the Oil was Too Clean!

A common objection is that “A fine filter will plug up in no time flat.” That’s good because it means the filter is doing precisely what it was designed to do – remove dirt. It’s neither hard nor cost-prohibitive to upgrade filtration on a Gearbox. Implementation can make a massive improvement to your business. Moving from a Dirtbox to a Gearbox enhances reliability and yields significant savings.

OEM’s and End Users are providing great stories about how they use Offline Filters on their Gearboxes. A common theme is that Offline Filters deliver amazing benefits. Here are a few examples.

CASE STUDY 1:

REFINERY “DIRTBOX” CONVERTED TO A REFINERY GEARBOX

Global Mining and Metals Company

System: Refinery Gearbox that was routinely highly contaminated
Oil type: 16 Gallons ISO VG 150 cSt

Continuous improvement and sustainable practices drove this End User to venture out and try alternative methods and approaches to extending asset life. The goal was to bring value to the work steam and ultimately serve the environment.



2.5 x
Gearbox Life Extension

Before Offline Filter Installed:

ISO 27/22/16 = DIRTBOX

1 WEEK

After Offline Filter Installed:

ISO 17/14/12 = GEARBOX



CASE STUDY 2: RAKE “DIRTBOX” CONVERTED TO A RAKE GEARBOX

Oil and Gas Producer

System: Rake Gearbox operating outdoors and heavily contaminated
Oil type: 12 Gallons ISO VG 680 cSt



Offline
Filter

Comments from Reliability Engineer:
“The amount of wear metals has decreased significantly! Since we have installed the unit, we haven’t had to change the oil at all since it has been so clean. Typically it has oxidized by now and is black. We haven’t seen any of that yet. So far we are very pleased with the results.”



CASE STUDY 3: WIND TURBINE “DIRTBOX” CONVERTED TO A WIND TURBINE GEARBOX

Wind Energy Company

System: 1.5 MW Wind Turbine Gearbox

Oil type: 80 Gallons ISO VG 320 cSt

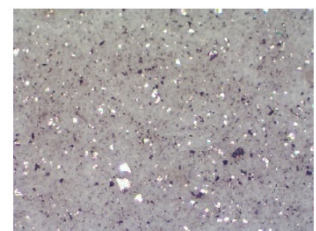
1.7 x
Gearbox Life Extension

Picture of a
Used
Filter Insert



Before Offline Filter Installed:

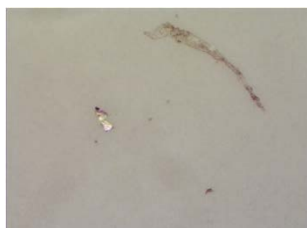
ISO 19/16/13 = DIRTBOX



1 WEEK

After Offline Filter Installed:

ISO 15/12/10 = GEARBOX



Results You Can See
Patch Test and 100X
Magnification



How to Convert from a “Dirtbox” to a Gearbox

Save Thousands of Dollars and Improve Reliability with These Simple Steps

STEP 1

Select a properly sized Offline Filter



STEP 2

Identify a Mounting Location on or near the Gearbox



STEP 3

Make the oil suction, oil return and electrical connections

More Information

Discover why Inline Filters alone cannot clean up gear oil: <https://youtu.be/wHgHtjvJN0>

For more information about Offline Filter Systems for gearboxes or any other lubricated machine, please contact C.C. Jensen at ccjensen@ccjensen.com, or call (770) 692-6001, or visit www.ccjensen.com