Customer Testimonial

Monolec Ultra® Engine Oil (8800) & AMS Filtration System

Oil Well Driller – Montana

Caterpillar® 3512 Stationary Engine

- **Extended drain interval by 500 hours with conversion to LE oil**
- **Extended drain interval by another 300 hours by adding AMS filtration system**
- **Combined, the changes created a 300 to 500 percent potential increase in component life**

Customer Profile

An oil well driller is paid to drill holes and find oil. The length of time it takes to perform these tasks is a major factor in determining the driller's profitability.

Application

The customer uses two Caterpillar® 3512 stationary engines for its drilling needs.

Challenge

While using a major brand engine oil with no filtration, other than the OEM filter, the customer was changing its oil every 500 hours. Considering that the driller runs two 12-man crews 24 hours a day, seven days a week, this process was expensive and time-consuming.

LE Solution

The local LE lubrication consultant recommended LE's Monolec Ultra® Engine Oil (8800). After using this extended drain 15W-40 diesel oil in its two Caterpillar engines, the customer only needed to replace the OEM filter every 500 hours and change the oil every 1,000 hours – a doubling of the previous drain interval. This helped the customer increase its production and lessen its environmental impact.

However, the customer wanted to extend the drain even further without sacrificing any performance or allowing the oil to get any dirtier. At this point, the LE consultant brought in one of LE's reliability partners - AMS Filtration - to make a two-canister system for each of the engines, complete with fittings and a steel plate ready to mount to the outer frame. The customer welded the plate to the frame, connected the fittings, and was up and running with the new system on both of its engines in less than two hours.

Results

After combining the Monolec Ultra oil with the new AMS Filtration system, the oil was substantially cleaner – even after 1,300 hours – as revealed by the following oil analysis reports. According to Noria Corporation's Life Extension Table (following the reports), the combined effect of using the new oil and the new filtration system was at least a 300 percent increase in component life, while extending the drain interval by another 300 hours.

The customer was pleased that the two changes recommended by LE allowed it to improve the reliability of its key asset – its engines – and increase its production.

Oil Analysis Reports

Note the particle counts, as shown by pore blockage PC, show how much cleaner the oil is at 1,300 hours (with the use of LE engine oil combined with AMS Filtration system) than it was before at just 1,093 or even 492 hours.

Unit ID:	24Z05269 #2 ENG
Client ID:	3926
Unit Type:	DIESEL ENGINE
Unit Make:	CAT
Unit Model:	3512
Equip Type:	
Equip Serial:	

ATTENTION CODE:
MILD CAUTION

Lube Type:	LE 8800
Grade:	15W40
Capacity:	

REMARKS

*
* WEAR LEVELS APPEAR NORMAL.
* OIL OXIDATION APPEARS SLIGHTLY ABOVE NORMAL.
* PARTICLES LESS THAN 6 MICRONS SLIGHTLY ABOVE NORMAL
* CHANGE FILTERS. RESAMPLE AT NORMAL INTERVAL.

ATTENTION CODES

AAA	Acceptable	NNN	Negative
!!!!	Critical	DDD	Critical - Below
EEE	Excessive		
CCC	Caution	MMM	Moderate
****	Severe	CCC	Severe - Below
====	Caution	BBB	Caution - Below
----	Slightly Above Normal		
LLL	Slightly Below Normal		

	WEAR METALS										MULTISOURCE					ADDITIVES								
	IRON	CHROMIUM	LEAD	COPPER	TIN	ALUMINUM	NICKEL	SILVER	TITANIUM	VANADIUM	SILICON	BORON	SODIUM	POTASSIUM	MAGNESIUM	CALCIUM	PHOSPHORUS	ZINC	MOLYBDENUM	BARIUM	VISC 40c cST	VISC 100c cST	VISC INDEX
Sample: 161908 Date Taken: 5/31/2008 Date Tested: 6/13/2008 Hrs/Mls [Oil: 1093 | Unit: 10552]	6	0	2	5	1	2	0	0	0	1	3	1	16	3	888	1083	1337	1281	39	2	0	13.76	0
Sample: 158230 Date Taken: 4/19/2008 Date Tested: 5/12/2008 Hrs/Mls [Oil: 492 | Unit: 10451]	3	0	0	2	1	2	0	0	0	1	5	2	13	3	824	1168	1305	1359	32	0	0	13.84	0

	AN	BN	>4(c)	>6(c)	>14(c)	>25(c)	>50(c)	>100(c)	ISO	% WATER	K FISCH	FUEL	GLYC	SOOT	OXI	NIT
161908	0	0	28971	15775	2685 ----	541	53	3	22/21/19	0	0	AAA	NNN	0.017	16 ----	9
158230	0	0	36132	19675	3348 ----	675 ----	66	4	22/21/19	0	0	AAA	NNN	0.007	14	7

BEFORE

Unit ID: 24Z05269 #2 ENG
Client ID: 3926

Unit Type: DIESEL ENGINE
Unit Make: CAT
Unit Model: 3512
Equip Type:
Equip Serial:

ATTENTION CODE:
FYI

Lube Type: LE 8800
Grade: 15W40
Capacity:

REMARKS

*
* TEST RESULTS PROVIDED FOR INFORMATION ONLY.

ATTENTION CODES

AAA	Acceptable	NNN	Negative
!!!!	Critical	DDD	Critical - Below
EEE	Excessive		
CCC	Caution	MMM	Moderate
****	Severe	CCC	Severe - Below
====	Caution	BBB	Caution - Below
----	Slightly Above Normal		
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WEAR METALS										MULTISOURCE					ADDITIVES							
IRON	CHROMIUM	LEAD	COPPER	TIN	ALUMINUM	NICKEL	SILVER	TITANIUM	VANADIUM	SILICON	BORON	SODIUM	POTASSIUM	MAGNESIUM	CALCIUM	PHOSPHORUS	ZINC	MOLYBDENUM	BARIUM	VISC 40c cST	VISC 100c cST	VISC INDEX
Sample: 181356 Date Taken: 12/26/2008 Date Tested: 1/8/2009 Hrs/Mls [Oil: 1312 | Unit: 15501]																						
6	0	2	6	0	2	0	0	0	1	2	0	8	2	942	1055	1195	1282	39	1	0	13.77	0
Sample: 175673 Date Taken: 10/22/2008 Date Tested: 11/4/2008 Hrs/Mls [Oil: 1301 | Unit: 14189]																						
5	0	1	5	0	1	0	0	0	0	0	0	8	1	997	1073	1402	1343	36	0	0	13.95	0
Sample: 166845 Date Taken: 7/29/2008 Date Tested: 8/6/2008 Hrs/Mls [Oil: 1226 | Unit: 12355]																						
6	0	2	6	1	2	0	0	0	1	3	0	8	2	1024	1061	1146	1320	35	2	0	13.96	0
Sample: 164227 Date Taken: 6/24/2008 Date Tested: 7/8/2008 Hrs/Mls [Oil: 490 | Unit: 11619]																						
3	0	1	2	0	1	0	0	0	0	3	0	8	2	873	963	1228	1266	34	0	0	13.88	0

	AN	BN	>4(c)	>6(c)	>14(c)	>25(c)	>50(c)	>100(c)	ISO	% WATER	K FISCH	FUEL	GLYC	SOOT	OXI	NIT
181356	0	0	2014	1097	187	38	4	0	18/17/15	0	0			0.008	18	9
175673	0	0	7403	4031	686	138	13	1	20/19/17	0	0			0.038	16	9
166845	0	0	611	333	57	11	1	0	16/16/13	0	0	AAA	NNN	0.016	15 ----	8
164227	0	0	330	180	31	6	1	0	16/15/12	0	0			0	13	7

LAB USE ONLY:

AFTER

Life Extension Table

Using the numbers from the oil analysis reports and plugging them into Noria Corporation's table below, it is possible to estimate the component life extensions that are achievable.

Examples

- 22/21/19 without filter @ 1,093 hours vs. 18/17/15 with filter @ 1,312 hours, which equates to a potential three times extension of component life.
- 22/21/19 without filter @ 492 hours vs. 16/15/12 with filter @ 490 hours, which equates to a potential five times extension of component life.

New Cleanliness Level (ISO Code)

Current Machine Cleanliness (ISO Code)

	20/17		19/16		18/15		17/14		16/13		15/12		14/11		13/10		12/9		11/8		10/7	
26/23	5	3	7	3.5	9	4	>10	5	>10	6	>10	7.5	>10	9	>10	>10	>10	>10	>10	>10	>10	>10
	4	2.5	4.5	3	6	3.5	6.5	4	7.5	5	8.5	6.5	10	7	>10	9	>10	10	>10	>10	>10	>10
25/22	4	2.5	5	3	7	3.5	9	4	>10	5	>10	6	>10	7	>10	9	>10	>10	>10	>10	>10	>10
	3	2	3.5	2.5	4.5	3	5	3.5	6.5	4	8	5	9	6	10	7.5	>10	9	>10	>10	>10	>10
24/21	3	2	4	2.5	6	3	7	4	9	5	>10	6	>10	7	>10	8	>10	10	>10	>10	>10	>10
	2.5	1.5	3	2	4	2.5	5	3	6.5	4	7.5	5	8.5	6	9.5	7	>10	8	>10	10	>10	>10
23/20	2	1.5	3	2	4	2.5	5	3	7	3.5	9	4	>10	5	>10	6	>10	8	>10	9	>10	>10
	1.7	1.3	2.3	1.5	3	2	3.7	2.5	5	3	6	3.5	7	4	8	5	10	6.5	>10	8.5	>10	10
22/19	1.6	1.3	2	1.6	3	2	4	2.5	5	3	7	3.5	8	4	>10	5	>10	6	>10	7	>10	>10
	1.4	1.1	1.8	1.3	2.3	1.7	3	2	3.5	2.5	4.5	3	5.5	3.5	7	4	8	5	10	5.5	>10	8.5
21/18	1.3	1.2	1.5	1.5	2	1.7	3	2	4	2.5	5	3	7	3.5	9	4	>10	5	>10	7	>10	10
	1.2	1.1	1.5	1.3	1.8	1.4	2.2	1.6	3	2	3.5	2.5	4.5	3	5	3.5	7	4	9	5.5	10	8
20/17			1.3	1.2	1.6	1.5	2	1.7	3	2	4	2.5	5	3	7	4	9	5	>10	7	>10	9
			1.2	1.05	1.5	1.3	1.8	1.4	2.3	1.7	3	2	3.5	2.5	5	3	6	4	8	5.5	10	7
19/16					1.3	1.2	1.6	1.5	2	1.7	3	2	4	2.5	5	3	7	4	9	6	>10	8
					1.2	1.1	1.5	1.3	1.8	1.5	2.2	1.7	3	2	3.5	2.5	5	3.5	7	4.5	9	6
18/15							1.3	1.2	1.6	1.5	2	1.7	3	2	4	2.5	5	3	7	4.5	>10	6
							1.2	1.1	1.5	1.3	1.8	1.5	2.3	1.7	3	2	3.5	2.5	5.5	3.7	8	5
17/14									1.3	1.2	1.6	1.5	2	1.7	3	2	4	2.5	6	3	8	5
									1.2	1.1	1.5	1.3	1.8	1.5	2.3	1.7	3	2	4	2.5	6	3.5
16/13											1.3	1.2	1.6	1.5	2	1.7	3	2	4	3.5	6	4
											1.2	1.1	1.5	1.3	1.8	1.5	2.3	1.8	3.7	3	4.5	3.5
15/12													1.3	1.2	1.6	1.5	2	1.7	3	2	4	2.5
													1.2	1.1	1.5	1.4	1.8	1.5	2.3	1.8	3	2.2
14/11															1.3	1.3	1.6	1.6	2	1.8	3	2
															1.3	1.2	1.6	1.4	1.9	1.5	2.3	1.8
13/10																	1.4	1.2	1.8	1.5	2.5	1.8
																	1.2	1.1	1.6	1.3	2	1.6

Hydraulics and Diesel Engines	Rolling Element Bearings
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Based on ISO 4406:99 - 4 Million range number has been omitted.

SIC 1381
LI70786 8-11, rev. 1-16

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