



Hydraulics, Digger Hydraulic Systems : Thiess, Mt Owen

Thiess Mt Owen

Thiess at Mt Owen have implemented a proactive approach to contamination control, this includes improved breathers on their bulk oil tanks and monitoring cleanliness of the oil being delivered to both the machine and the bulk storage facility on site. As part of this process FTA systems were fitted onboard the diggers rather than kidney looping the hydraulic circuits at service as they saw added benefit in continual onboard bypass filtration.



Thiess fitted all six of their digger hydraulic systems at Mt Owen with FTA's bypass filtration systems, JQ440's on the three 996 Liebherr's and JQ240's on two 994 Liebherr's and Hitachi 2500 also they have just placed an order for another JQ 440 for the 996 Liebherr to be commission April 05.

As a result of their contamination control all there digger hydraulics are running at ISO16/13 or better, Pump Life has improved from 12,000 to 18,000 hours and Cylinder Ram life from 5000 to 8000 hours which relates to lower operating costs and improved availability of their machines.

The reports attached is of one of the 994's which typically represents what as been achieved.

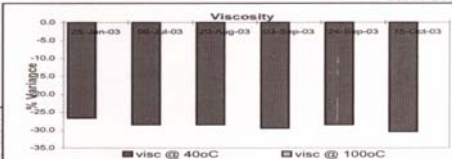


TECHENOMICS

TECHNICAL ADVANCE FOR ECONOMIC GAIN

Wear Metal Report: **169,441**
 Client: **MT OWEN**
 Attention: **ROGER CLEMENT**
 Machine: **LIEBHERR 994 EXCAVATOR**
 ID. No.: **EX1080**
 Oil Name: **BP VANELLUS C6**
 Compartment: **HYDRAULICS**

Sample Date	25/06/03	6/07/03	20/08/03	3/09/03	24/08/03	15/10/03
Sample no.	166840	167734	168109	168385	168861	169441
SMU	5235hrs	6889hrs	8082hrs	6295hrs	6858hrs	6988hrs
Oil Hrs	0	No	No	0	0	0
Oil Changed	0	No	No	0	0	0
Wear Metals	ppm	ppm	ppm	ppm	ppm	ppm
lead	2	2	1	1	2	2
iron	10	9	9	23	8	9
aluminium	5	5	4	4	5	5
copper	6	4	4	4	3	4
chromium	3	2	3	3	3	2
tin	0	0	0	0	0	0
nickel	0	0	1	1	1	1
Contaminants	ppm	ppm	ppm	ppm	ppm	ppm
silicon	10	9	9	9	9	9
sodium	1.0	0	1.0	0	0	0
Oil Additives	ppm	ppm	ppm	ppm	ppm	ppm
magnesium	13	12	12	12	12	11
zinc	1430	1343	1465	1499	1364	1410
molybdenum	0	0	0	10	1	2
calcium	6263	5491	6720	7327	6358	6004
phosphorous	1590	1356	1609	1431	1690	1605
boron	35	12	13	12	10	10



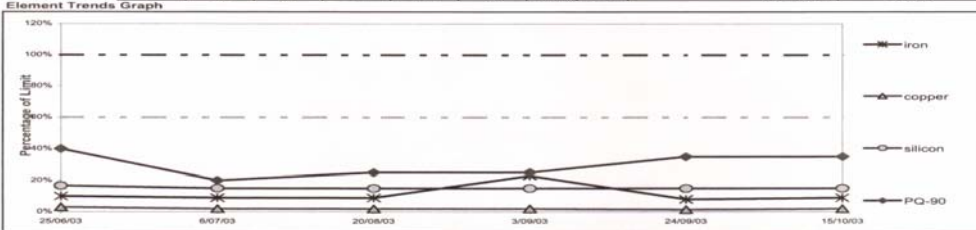
Comments on elevated results
 Viscosity @ 40oC 30% below BP Vanellus C6. Viscosity and sodium trends are stable. Wear metals are within acceptable limits. Continue to Monitor.

Results before filtration
 ISO 22/17/12
 Count 1ml 34,662ppm

Infra Red	25/06/03	6/07/03	20/08/03	3/09/03	24/08/03	15/10/03
TBN	0	0	0	0	0	0
soot	0	0	0	0	0	0
glycol%	0	0	0	0	0	0
water (ppm)	0	0	0	0	0	0
fuel dilution%	0	0	0	0	0	0
oxidation	0	0	0	0	0	0
nitration	0	0	0	0	0	0
sulphation	0	0	0	0	0	0

Physical Tests	25/06/03	6/07/03	20/08/03	3/09/03	24/08/03	15/10/03
water %	0	0	0	0	0	0
PQ-90 mg / ltr	8	4	5	5	7	12
visc @ 100oC	0	0	0	0	0	0
visc @ 40oC	7.7	7.5	7.5	7.4	7.5	7.3

Particle Cleanliness Analysis	ISO 4406 - 02	ISO 4406 - 05	ISO 4406 - 15	Count 1ml
	22	17	12	34662



For enquiries, contact: SINGLETON LABORATORY phone: 02 65712699 fax: 02 65712044 mobile: 0419604431
 This wear analysis and oil condition report should be used in conjunction with normal maintenance and evaluated from sample to sample. Every care will be taken in processing samples but no express or implied guarantee is furnished in regard to the continuing operation or condition of this machinery or any part thereof.

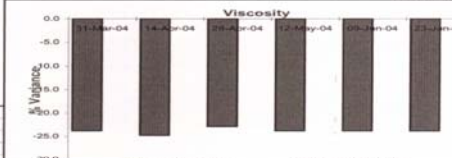
TECHENOMICS

CONDITION MONITORING

TECHNICAL ADVANCE FOR ECONOMIC GAIN

Wear Metal Report: **176,028**
 Client: **MT OWEN**
 Attention: **ROGER CLEMENT**
 Machine: **LIEBHERR 994 EXCAVATOR**
 ID. No.: **EX1080**
 Oil Name: **CALTEX DELO 400 15W/40**
 Compartment: **HYDRAULICS**

Sample Date	31/03/04	14/04/04	28/04/04	12/05/04	8/06/04	23/06/04
Analysis Date	2/04/04	15/04/04	28/04/04	13/05/04	11/06/04	23/06/04
Sample no.	173978	174278	174616	174917	175615	176028
SMU	9549hrs	9715hrs	997hrs	10211hrs	10848hrs	10986hrs
Oil Hrs	0	0	0	0	0	0
Oil Changed	0	No	No	No	No	No
Wear Metals	ppm	ppm	ppm	ppm	ppm	ppm
lead	1	1	1	2	1	1
iron	8	8	8	8	9	10
aluminium	4	5	4	5	3	3
copper	4	5	5	5	5	6
chromium	2	2	2	2	2	2
tin	0	0	0	0	0	0
nickel	0	1	1	1	1	1
Contaminants	ppm	ppm	ppm	ppm	ppm	ppm
silicon	6	7	8	7	7	8
sodium	0	0	0	0	0	0
Oil Additives	ppm	ppm	ppm	ppm	ppm	ppm
magnesium	10	10	10	10	11	11
zinc	1455	1600	1645	223	1828	1938
molybdenum	0	1	0	0	1	0
calcium	4308	5163	6050	5051	7052	8124
phosphorous	1368	1623	1787	1404	1735	1865
boron	5	5	5	4	5	5



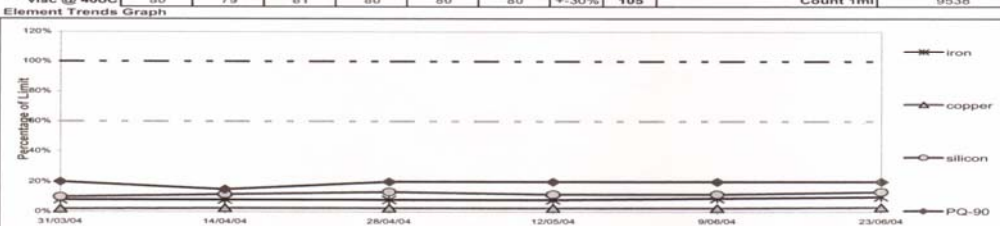
Comments on elevated results
 Oil properties normal. Wear and contamination within acceptable levels. Continue with regular maintenance.

Results after filtration
 ISO 19/16/13
 Count 1ml 9,538ppm
 Reduction 72%

Infra Red	31/03/04	14/04/04	28/04/04	12/05/04	8/06/04	23/06/04
TBN	0	0	0	0	0	0
soot	0	0	0	0	0	0
glycol%	0	0	0	0	0	0
water (ppm)	0.00	0.00	0.00	0.00	0.00	0.00
fuel dilution%	0	0	0	0	0	0
oxidation	0	0	0	0	0	0
nitration	0	0	0	0	0	0
sulphation	0	0	0	0	0	0

Physical Tests	31/03/04	14/04/04	28/04/04	12/05/04	8/06/04	23/06/04
water %	0.00	0.00	0.00	0.00	0.00	0.00
PQ-90 mg / ltr	4	3	4	4	4	4
visc @ 100oC	0	0	0	0	0	0
visc @ 40oC	8.0	7.9	8.1	8.0	8.0	8.0

Particle Cleanliness Analysis	ISO 4406 - 02	ISO 4406 - 05	ISO 4406 - 15	Count 1ml
	19	16	13	9538



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