

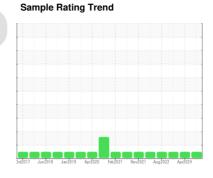
OIL ANALYSIS REPORT



KANSAS/15/EG - EXCAVATOR 20.135L [KANSAS^15^EG - EXCAVATOR]

Diesel Engine

CAT DIESEL ENGINE OIL 10W30 (--- GAL)





DIAGNOSIS

Recommendation

Resample at the next service interval to monitor.

All component wear rates are normal.

Contamination

There is no indication of any contamination in the

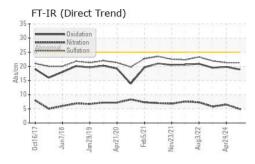
Fluid Condition

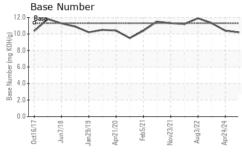
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

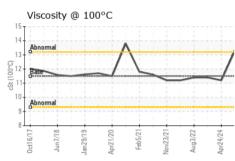
Sample Number	SAMPLE INFORM	MATION	method	limit/base	current	history1	history2
Machine Age hrs Client Info 7856 7825 7354 Oil Age hrs Client Info 31 471 364 Oil Changed Client Info Not Changed Changed Changed Changed Changed Sample Status word Imitibase current history history2 Fuel WC Method >5 <1.0	Sample Number		Client Info		WC0918245	WC0918412	WC0712234
Oil Age hrs Client Info 31 471 364 Oil Changed Sample Status Client Info Not Changed NoRMAL Changed Changed Changed NoRMAL NoRMAL NORMAL NORMAL NORMAL CONTAMINATION method limit/base current history2 history2 Fuel WC Method >5 <1.0	Sample Date		Client Info		06 Jun 2024	24 Apr 2024	12 May 2023
Oil Changed Sample Status Client Info Not Changed NORMAL Changed NoRMAG Changed NoRMAG Changed NoRMAG Changed NoRMAG Changed NoRMAG Changed NoRMAG Changed NoRMAG Changed NoRMAG Change NEG Change NEG<	Machine Age	hrs	Client Info		7856	7825	7354
Sample Status	Oil Age	hrs	Client Info		31	471	364
CONTAMINATION method limit/base current history1 history2 Fuel WC Method >5 <1.0 <1.0 <1.0 <1.0 Water WC Method >0.2 NEG NEG NEG Glycol WC Method NEG NEG NEG WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >100 8 36 28 Chromium ppm ASTM D5185m >20 <1 1 <1 Nickel ppm ASTM D5185m >2 0 <1 0 Silver ppm ASTM D5185m >2 0 <1 0 Silver ppm ASTM D5185m >2 0 <1 0 Silver ppm ASTM D5185m >40 0 2 0 Lead ppm ASTM D5185m >330 <1 <1 <1	Oil Changed		Client Info		Not Changd	Changed	Changed
Fuel	Sample Status				NORMAL	NORMAL	NORMAL
Water Glycol WC Method WC Method >0.2 NEG NEG NEG NEG NEG NEG WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >100 8 36 28 Chromium ppm ASTM D5185m >20 <1 1 <1 Nickel ppm ASTM D5185m >2 0 <1 0 Sliver ppm ASTM D5185m >2 0 <1 0 Sliver ppm ASTM D5185m >2 0 <1 0 Aluminum ppm ASTM D5185m >40 0 2 0 Copper ppm ASTM D5185m >40 0 2 0 Copper ppm ASTM D5185m >15 <1 2 0 Vanadium ppm ASTM D5185m 0 0 0 0 Cadmium ppm ASTM D5185m 0 0	CONTAMINATION	١	method	limit/base	current	history1	history2
WEAR METALS	Fuel		WC Method	>5	<1.0	<1.0	<1.0
WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >100 8 36 28 Chromium ppm ASTM D5185m >20 <1 1 <1 Nickel ppm ASTM D5185m >2 0 <1 0 Titanium ppm ASTM D5185m >2 0 <1 0 Aluminum ppm ASTM D5185m >2 0 <1 0 Aluminum ppm ASTM D5185m >2 0 <1 0 Aluminum ppm ASTM D5185m >2 0 <1 <1 <1 Lead ppm ASTM D5185m >2 0 0 0 0 0 Copper ppm ASTM D5185m >15 <1 2 0 0 Cadadum ppm ASTM D5185m 0 0 0 0 0 Barium ppm </th <th>Water</th> <th></th> <th>WC Method</th> <th>>0.2</th> <th>NEG</th> <th>NEG</th> <th>NEG</th>	Water		WC Method	>0.2	NEG	NEG	NEG
Iron	Glycol		WC Method		NEG	NEG	NEG
Chromium ppm ASTM D5185m >20 <1	WEAR METALS		method	limit/base	current	history1	history2
Nickel ppm ASTM D5185m >2 0 <1 0 Titanium ppm ASTM D5185m >2 0 <1	Iron	ppm	ASTM D5185m	>100	8	36	28
Titanium ppm ASTM D5185m >2 0 <1 0 Silver ppm ASTM D5185m >2 0 <1 0 Aluminum ppm ASTM D5185m >25 3 6 5 Lead ppm ASTM D5185m >40 0 2 0 Copper ppm ASTM D5185m >330 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1	Chromium	ppm	ASTM D5185m	>20	<1	1	<1
Silver	Nickel	ppm	ASTM D5185m	>2	0	<1	0
Aluminum	Titanium	ppm	ASTM D5185m	>2	0	<1	0
Lead ppm ASTM D5185m >40 0 2 0 Copper ppm ASTM D5185m >330 <1	Silver	ppm	ASTM D5185m	>2	0	<1	0
Copper ppm ASTM D5185m >330 <1	Aluminum	ppm	ASTM D5185m	>25	3	6	5
Tin ppm ASTM D5185m >15 <1	Lead	ppm	ASTM D5185m	>40	0	2	0
Vanadium ppm ASTM D5185m 0 0 0 Cadmium ppm ASTM D5185m 0 2 <1	Copper	ppm	ASTM D5185m	>330	<1	<1	<1
Cadmium ppm ASTM D5185m 0 2 <1	Tin	ppm	ASTM D5185m	>15	<1	2	0
ADDITIVES	Vanadium	ppm	ASTM D5185m		0	0	0
Boron ppm ASTM D5185m 145 73 44 75 Barium ppm ASTM D5185m 0.0 0 0 0 Molybdenum ppm ASTM D5185m 0.0 38 36 43 Manganese ppm ASTM D5185m 0 1 <1	Cadmium	ppm	ASTM D5185m		0	2	<1
Barium ppm ASTM D5185m 0.0 0 0 0 Molybdenum ppm ASTM D5185m 0.0 38 36 43 Manganese ppm ASTM D5185m 0.0 1 <1 Magnesium ppm ASTM D5185m 248 475 530 513 Calcium ppm ASTM D5185m 2203 1619 1819 1795 Phosphorus ppm ASTM D5185m 731 795 1018 1016 Zinc ppm ASTM D5185m 1460 906 1208 1168 Sulfur ppm ASTM D5185m 5088 2628 3760 3282 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 4 6 9 Sodium ppm ASTM D5185m 2 12 3 3 INFRA-RED method limit/base cur	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum ppm ASTM D5185m 0.0 38 36 43 Manganese ppm ASTM D5185m 0 1 <1	Boron	ppm	ASTM D5185m	145	73	44	75
Manganese ppm ASTM D5185m 0 1 <1	Barium	ppm	ASTM D5185m	0.0	0	0	0
Magnesium ppm ASTM D5185m 248 475 530 513 Calcium ppm ASTM D5185m 2203 1619 1819 1795 Phosphorus ppm ASTM D5185m 731 795 1018 1016 Zinc ppm ASTM D5185m 1460 906 1208 1168 Sulfur ppm ASTM D5185m 5088 2628 3760 3282 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 4 6 9 Sodium ppm ASTM D5185m 22 12 5 Potassium ppm ASTM D5185m >20 2 3 3 INFRA-RED method limit/base current history1 history2 Soot % *ASTM D7624 >20 4.9 6.5 5.8 Sulfation Abs/.1mm *ASTM D7415 >30 21.3	Molybdenum	ppm	ASTM D5185m	0.0	38	36	43
Calcium ppm ASTM D5185m 2203 1619 1819 1795 Phosphorus ppm ASTM D5185m 731 795 1018 1016 Zinc ppm ASTM D5185m 1460 906 1208 1168 Sulfur ppm ASTM D5185m 5088 2628 3760 3282 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 4 6 9 Sodium ppm ASTM D5185m 2 12 5 Potassium ppm ASTM D5185m >20 2 3 3 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7624 >3 0.1 0.2 0.1 Nitration Abs/.1mm *ASTM D7415 >30 21.3 21.3 21.3 21.9 FLUID DEGRADATION method	Manganese	ppm	ASTM D5185m		0	1	<1
Phosphorus ppm ASTM D5185m 731 795 1018 1016 Zinc ppm ASTM D5185m 1460 906 1208 1168 Sulfur ppm ASTM D5185m 5088 2628 3760 3282 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 4 6 9 Sodium ppm ASTM D5185m 2 12 5 Potassium ppm ASTM D5185m >20 2 3 3 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7624 >20 4.9 6.5 5.8 Sulfation Abs/.1mm *ASTM D7415 >30 21.3 21.3 21.9 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7	Magnesium	ppm	ASTM D5185m	248	475	530	513
Zinc ppm ASTM D5185m 1460 906 1208 1168 Sulfur ppm ASTM D5185m 5088 2628 3760 3282 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 4 6 9 Sodium ppm ASTM D5185m 2 12 5 Potassium ppm ASTM D5185m >20 2 3 3 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7624 >3 0.1 0.2 0.1 Nitration Abs/.1mm *ASTM D7624 >20 4.9 6.5 5.8 Sulfation Abs/.1mm *ASTM D7415 >30 21.3 21.3 21.3 21.9 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm <th>Calcium</th> <th>ppm</th> <th>ASTM D5185m</th> <th>2203</th> <th>1619</th> <th>1819</th> <th>1795</th>	Calcium	ppm	ASTM D5185m	2203	1619	1819	1795
Sulfur ppm ASTM D5185m 5088 2628 3760 3282 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 4 6 9 Sodium ppm ASTM D5185m 2 12 5 Potassium ppm ASTM D5185m >20 2 3 3 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.1 0.2 0.1 Nitration Abs/cm *ASTM D7624 >20 4.9 6.5 5.8 Sulfation Abs/.1mm *ASTM D7415 >30 21.3 21.3 21.9 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 18.9 19.8 19.5	Phosphorus	ppm	ASTM D5185m	731	795	1018	1016
CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 4 6 9 Sodium ppm ASTM D5185m 2 12 5 Potassium ppm ASTM D5185m >20 2 3 3 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.1 0.2 0.1 Nitration Abs/cm *ASTM D7624 >20 4.9 6.5 5.8 Sulfation Abs/.1mm *ASTM D7415 >30 21.3 21.3 21.3 21.9 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 18.9 19.8 19.5		ppm	ASTM D5185m	1460	906	1208	1168
Silicon ppm ASTM D5185m >25 4 6 9 Sodium ppm ASTM D5185m 2 12 5 Potassium ppm ASTM D5185m >20 2 3 3 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.1 0.2 0.1 Nitration Abs/cm *ASTM D7624 >20 4.9 6.5 5.8 Sulfation Abs/.1mm *ASTM D7415 >30 21.3 21.3 21.9 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 18.9 19.8 19.5	Sulfur	ppm	ASTM D5185m	5088	2628	3760	3282
Sodium ppm ASTM D5185m 2 12 5 Potassium ppm ASTM D5185m >20 2 3 3 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.1 0.2 0.1 Nitration Abs/cm *ASTM D7624 >20 4.9 6.5 5.8 Sulfation Abs/.1mm *ASTM D7415 >30 21.3 21.3 21.9 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 18.9 19.8 19.5	CONTAMINANTS		method	limit/base	current	history1	history2
Potassium ppm ASTM D5185m >20 2 3 3 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.1 0.2 0.1 Nitration Abs/cm *ASTM D7624 >20 4.9 6.5 5.8 Sulfation Abs/.1mm *ASTM D7415 >30 21.3 21.3 21.9 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 18.9 19.8 19.5				>25	4		9
INFRA-RED	Sodium	ppm	ASTM D5185m		2	12	5
Soot % % *ASTM D7844 >3 0.1 0.2 0.1 Nitration Abs/cm *ASTM D7624 >20 4.9 6.5 5.8 Sulfation Abs/.1mm *ASTM D7415 >30 21.3 21.3 21.9 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 18.9 19.8 19.5	Potassium	ppm	ASTM D5185m	>20	2	3	3
Nitration Abs/cm *ASTM D7624 >20 4.9 6.5 5.8 Sulfation Abs/.1mm *ASTM D7415 >30 21.3 21.3 21.9 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 18.9 19.8 19.5	INFRA-RED		method	limit/base	current	history1	history2
Sulfation Abs/.1mm *ASTM D7415 >30 21.3 21.3 21.9 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 18.9 19.8 19.5	Soot %	%	*ASTM D7844	>3	0.1	0.2	0.1
FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 18.9 19.8 19.5							
Oxidation Abs/.1mm *ASTM D7414 >25 18.9 19.8 19.5	Nitration	Abs/cm	*ASTM D7624	>20	4.9	6.5	5.8
Base Number (BN) mg KOH/g ASTM D2896 11.3 10.2 10.4 11.3	Sulfation	Abs/.1mm	*ASTM D7415	>30	21.3	21.3	21.9
	Sulfation FLUID DEGRADA	Abs/.1mm	*ASTM D7415 method	>30 limit/base	21.3 current	21.3 history1	21.9 history2

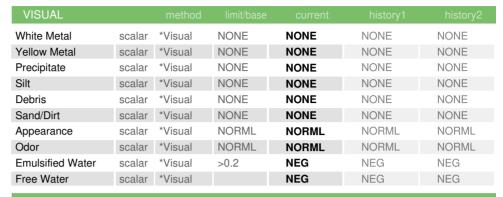


OIL ANALYSIS REPORT



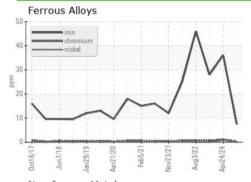


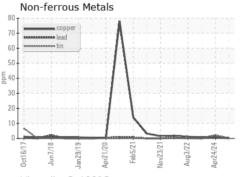


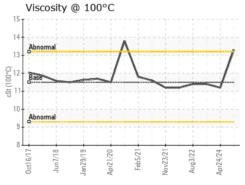


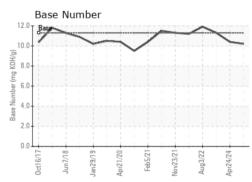
FLUID PROPER	ITIES	method				history2
Visc @ 100°C	cSt	ASTM D445	11.5	13.3	11.2	11.4

GRAPHS













Certificate 12367

Laboratory Sample No.

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 : WC0918245 Lab Number : 06208414 Unique Number : 11075875

Received **Tested**

: 14 Jun 2024 Diagnosed : 14 Jun 2024 - Angela Borella Test Package : CONST (Additional Tests: TBN)

: 13 Jun 2024

3219 WEST MAY ST

US 67213 Contact: DOUG KING doug.king@sherwood.net T: (316)617-3161

To discuss this sample report, contact Customer Service at 1-800-237-1369. * - Denotes test methods that are outside of the ISO 17025 scope of accreditation.

Statements of conformity to specifications are based on the simple acceptance decision rule (JCGM 106:2012)

SHERWOOD CONSTRUCTION CO INC

F: x:

WICHITA, KS