

OIL ANALYSIS REPORT

Sample Rating Trend

NORMAL

Area

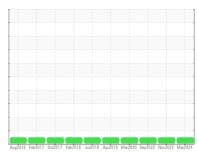
K5 CONSTRUCTION CORPORATION - HODGKINS IL

4537

Diesel Engine

Fluid

LEAHY WOLF PREMIUM 15W40 (6 hrs)





DIAGNOSIS

Recommendation

Resample at the next service interval to monitor.

Moor

All component wear rates are normal.

Contamination

There is no indication of any contamination in the oil

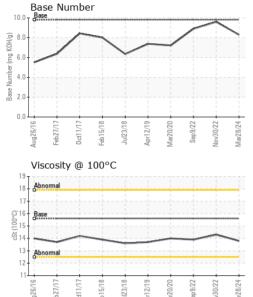
Fluid Condition

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 Client Info PCA0122083 LW0006443 LW0006614 Sample Date Client Info 28 Mar 2024 30 Nov 2022 09 Sep 2022 09					018 Apr2019 Mar2020 Sep2022 Nov2		
Sample Date Client Info 28 Mar 2024 30 Nov 2022 09 Sep 2022 Machine Age hrs Client Info 2396 2	SAMPLE INFORI	MATION	method	limit/base	current	history1	history2
Machine Age hrs Client Info 2396 2396 2396 2396 2396 2396 2396 23396 2396 23386 240	Sample Number		Client Info		PCA0122083	LW0006443	LW0005614
Oil Age hrs Client Info 2396 213 310 Oil Changed Changed <td>Sample Date</td> <td></td> <td>Client Info</td> <td></td> <th>28 Mar 2024</th> <td>30 Nov 2022</td> <td>09 Sep 2022</td>	Sample Date		Client Info		28 Mar 2024	30 Nov 2022	09 Sep 2022
Client Info	Machine Age	hrs	Client Info		2396	2396	2396
NORMAL NORMAL NORMAL CONTAMINATION method limit/base current history1 history2 history2	Oil Age	hrs	Client Info		2396	213	310
CONTAMINATION	Oil Changed		Client Info		Changed	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 current history1 history2 Iron ppm ASTM D5185m >100 15 23 82 Chromium ppm ASTM D5185m >20 <1 1 2 Nickel ppm ASTM D5185m >2 0 <1 0 0 Silver ppm ASTM D5185m >2 1 <1 0 0 Silver ppm ASTM D5185m >2 0 0 0 0 Aluminum ppm ASTM D5185m >2 0 0 0 0 Lead ppm ASTM D5185m >40 0 0 <1 4 Copper ppm ASTM D5185m >330 <1 <1 4 4 Tin ppm ASTM D5185m 0 0 0 0 0 0 0 0 0 0 0 0 0 0	CONTAMINAT	ION	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 15 23 82 Chromium ppm ASTM D5185m >20 <1	Water		WC Method	>0.2	NEG	NEG	NEG
Iron	Glycol		WC Method		NEG	NEG	NEG
Chromium ppm ASTM D5185m >20 <1 1 2 Nickel ppm ASTM D5185m >2 0 <1	WEAR METAL	S	method	limit/base	current	history1	history2
Nickel	Iron	ppm	ASTM D5185m	>100	15	23	82
Titanium ppm ASTM D5185m >2 1 <1 0 Silver ppm ASTM D5185m >2 0 0 0 Aluminum ppm ASTM D5185m >25 2 2 9 Lead ppm ASTM D5185m >40 0 0 <1 4 Copper ppm ASTM D5185m >330 <1 <1 4 4 Tin ppm ASTM D5185m >15 <1 0 <1 4 Antimony ppm ASTM D5185m 0 0 0 0 Vanadium ppm ASTM D5185m 0 0 0 0 Cadmium ppm ASTM D5185m 0 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 0 0 0 Boron ppm ASTM D5185m 54	Chromium	ppm	ASTM D5185m	>20	<1	1	2
Silver	Nickel	ppm	ASTM D5185m	>2	0	<1	0
Aluminum	Titanium	ppm	ASTM D5185m	>2	1	<1	0
Lead		ppm	ASTM D5185m	>2	0	0	0
Copper ppm ASTM D5185m >330 <1 <1 4 Tin ppm ASTM D5185m >15 <1	Aluminum	ppm	ASTM D5185m	>25	2	2	9
Tin ppm ASTM D5185m >15 <1 0 <1 Antimony ppm ASTM D5185m Vanadium ppm ASTM D5185m 0 0 0 Cadmium ppm ASTM D5185m 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 6 6 6 5 Barium ppm ASTM D5185m 0 0 0 Molybdenum ppm ASTM D5185m 54 60 59 Manganese ppm ASTM D5185m <1 <1 <1 <1 Magnesium ppm ASTM D5185m 909 945 894 Calcium ppm ASTM D5185m 1129 1261 1166 Phosphorus ppm ASTM D5185m 1262 1344 1311 Sulfur ppm ASTM D5185m 3526	Lead	ppm	ASTM D5185m	>40	0	0	<1
Antimony ppm ASTM D5185m	Copper	ppm	ASTM D5185m	>330	<1	<1	4
Vanadium ppm ASTM D5185m 0 0 0 Cadmium ppm ASTM D5185m 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 6 6 5 Barium ppm ASTM D5185m 0 0 0 Molybdenum ppm ASTM D5185m 54 60 59 Manganese ppm ASTM D5185m -1 -1 -1 Magnesium ppm ASTM D5185m 909 945 894 Calcium ppm ASTM D5185m 1129 1261 1166 Phosphorus ppm ASTM D5185m 1073 1104 1093 Zinc ppm ASTM D5185m 1262 1344 1311 Sulfur ppm ASTM D5185m 3526 3905 2985 Lithium ppm ASTM D5185m >25 6 5 7	Tin	ppm	ASTM D5185m	>15	<1	0	<1
Cadmium ppm ASTM D5185m 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 6 6 5 Barium ppm ASTM D5185m 0 0 0 Molybdenum ppm ASTM D5185m 54 60 59 Manganese ppm ASTM D5185m 909 945 894 Calcium ppm ASTM D5185m 1129 1261 1166 Phosphorus ppm ASTM D5185m 1073 1104 1093 Zinc ppm ASTM D5185m 1262 1344 1311 Sulfur ppm ASTM D5185m 3526 3905 2985 Lithium ppm ASTM D5185m CONTAMINANTS method limit/base current history1 history2 Solicon ppm ASTM D5185m 1 1	Antimony	ppm	ASTM D5185m				
ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 6 6 5 Barium ppm ASTM D5185m 0 0 0 Molybdenum ppm ASTM D5185m 54 60 59 Manganese ppm ASTM D5185m 909 945 894 Calcium ppm ASTM D5185m 1129 1261 1166 Phosphorus ppm ASTM D5185m 1073 1104 1093 Zinc ppm ASTM D5185m 1262 1344 1311 Sulfur ppm ASTM D5185m 3526 3905 2985 Lithium ppm ASTM D5185m CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m 25 6 5 7 Sodium ppm ASTM D5185m 1	Vanadium	ppm	ASTM D5185m		0	0	0
Boron	Cadmium	ppm	ASTM D5185m		0	0	0
Barium ppm ASTM D5185m 0 0 0 Molybdenum ppm ASTM D5185m 54 60 59 Manganese ppm ASTM D5185m -1 <1 <1 Magnesium ppm ASTM D5185m 909 945 894 Calcium ppm ASTM D5185m 1129 1261 1166 Phosphorus ppm ASTM D5185m 1073 1104 1093 Zinc ppm ASTM D5185m 3526 3905 2985 Lithium ppm ASTM D5185m CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 6 5 7 Sodium ppm ASTM D5185m >20 0 1 2 INFRA-RED method limit/base current history1 history2 Soot % *ASTM D7624 >20	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum ppm ASTM D5185m 54 60 59 Manganese ppm ASTM D5185m <1 <1 <1 Magnesium ppm ASTM D5185m 909 945 894 Calcium ppm ASTM D5185m 1129 1261 1166 Phosphorus ppm ASTM D5185m 1073 1104 1093 Zinc ppm ASTM D5185m 1262 1344 1311 Sulfur ppm ASTM D5185m 3526 3905 2985 Lithium ppm ASTM D5185m CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 6 5 7 Sodium ppm ASTM D5185m >20 0 1 2 INFRA-RED method limit/base current history1 history2 Soot % *ASTM D7624	Boron	ppm	ASTM D5185m		6	6	5
Manganese ppm ASTM D5185m <1 <1 <1 Magnesium ppm ASTM D5185m 909 945 894 Calcium ppm ASTM D5185m 1129 1261 1166 Phosphorus ppm ASTM D5185m 1073 1104 1093 Zinc ppm ASTM D5185m 1262 1344 1311 Sulfur ppm ASTM D5185m 3526 3905 2985 Lithium ppm ASTM D5185m CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 6 5 7 Sodium ppm ASTM D5185m >20 0 1 2 INFRA-RED method limit/base current history1 history2 Soot % *ASTM D7624 >3 0.2 0.2 0.4 Nitration Abs/cm *ASTM D762	Barium	ppm	ASTM D5185m		0	0	0
Magnesium ppm ASTM D5185m 909 945 894 Calcium ppm ASTM D5185m 1129 1261 1166 Phosphorus ppm ASTM D5185m 1073 1104 1093 Zinc ppm ASTM D5185m 1262 1344 1311 Sulfur ppm ASTM D5185m 3526 3905 2985 Lithium ppm ASTM D5185m CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 6 5 7 Sodium ppm ASTM D5185m >20 0 1 2 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7624 >20 8.4 9.1 11.4	Molybdenum	ppm	ASTM D5185m		54	60	59
Calcium ppm ASTM D5185m 1129 1261 1166 Phosphorus ppm ASTM D5185m 1073 1104 1093 Zinc ppm ASTM D5185m 1262 1344 1311 Sulfur ppm ASTM D5185m 3526 3905 2985 Lithium ppm ASTM D5185m CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 6 5 7 Sodium ppm ASTM D5185m >20 0 1 2 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.2 0.2 0.4 Nitration Abs/cm *ASTM D7624 >20 8.4 9.1 11.4	Manganese	ppm	ASTM D5185m		<1	<1	<1
Phosphorus ppm ASTM D5185m 1073 1104 1093 Zinc ppm ASTM D5185m 1262 1344 1311 Sulfur ppm ASTM D5185m 3526 3905 2985 Lithium ppm ASTM D5185m CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 6 5 7 Sodium ppm ASTM D5185m 20 0 1 <1 <1 Potassium ppm ASTM D5185m >20 0 1 2 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7624 >3 0.2 0.2 0.4 Nitration Abs/cm *ASTM D7624 >20 8.4 9.1 11.4	Magnesium	ppm	ASTM D5185m		909	945	894
Zinc ppm ASTM D5185m 1262 1344 1311 Sulfur ppm ASTM D5185m 3526 3905 2985 Lithium ppm ASTM D5185m CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 6 5 7 Sodium ppm ASTM D5185m 1 1 <1	Calcium	ppm	ASTM D5185m		1129	1261	1166
Sulfur ppm ASTM D5185m 3526 3905 2985 Lithium ppm ASTM D5185m CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 6 5 7 Sodium ppm ASTM D5185m >20 1 1 <1	Phosphorus	ppm	ASTM D5185m		1073	1104	1093
Lithium ppm ASTM D5185m CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 6 5 7 Sodium ppm ASTM D5185m 1 1 1 <1	Zinc	ppm	ASTM D5185m		1262	1344	1311
CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 6 5 7 Sodium ppm ASTM D5185m 1 1 1 <1	Sulfur	ppm	ASTM D5185m		3526	3905	2985
Silicon ppm ASTM D5185m >25 6 5 7 Sodium ppm ASTM D5185m 1 1 1 <1 Potassium ppm ASTM D5185m >20 0 1 2 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.2 0.2 0.4 Nitration Abs/cm *ASTM D7624 >20 8.4 9.1 11.4	Lithium	ppm	ASTM D5185m				
Sodium ppm ASTM D5185m 1 1 1 <1	CONTAMINAN	TS	method	limit/base	current	history1	history2
Potassium ppm ASTM D5185m >20 0 1 2 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.2 0.2 0.4 Nitration Abs/cm *ASTM D7624 >20 8.4 9.1 11.4		ppm		>25			7
INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.2 0.2 0.4 Nitration Abs/cm *ASTM D7624 >20 8.4 9.1 11.4	Sodium	ppm	ASTM D5185m		1	1	<1
Soot % % *ASTM D7844 >3 0.2 0.2 0.4 Nitration Abs/cm *ASTM D7624 >20 8.4 9.1 11.4	Potassium	ppm	ASTM D5185m	>20	0	1	2
Nitration Abs/cm *ASTM D7624 >20 8.4 9.1 11.4	INFRA-RED		method	limit/base	current	history1	history2
	Soot %	%	*ASTM D7844	>3	0.2	0.2	0.4
Sulfation Abs/.1mm *ASTM D7415 >30 18.1 19.5 20.7	Nitration	Abs/cm	*ASTM D7624	>20	8.4	9.1	11.4
	Sulfation	Abs/.1mm	*ASTM D7415	>30	18.1	19.5	20.7



OIL ANALYSIS REPORT



FLUID DEGRAD	NOITAC	method				history2
Oxidation	Abs/.1mm	*ASTM D7414	>25	15.8	16.5	19.8
Base Number (BN)	mg KOH/g	ASTM D2896	9.8	8.3	9.6	8.9
VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual	NONE	NONE	NONE	NONE
Appearance	scalar	*Visual	NORML	NORML	NORML	NORML
Odor	scalar	*Visual	NORML	NORML	NORML	NORML
Emulsified Water	scalar	*Visual	>0.2	NEG	NEG	NEG
Free Water	scalar	*Visual		NEG	NEG	NEG
FLUID PROPE	RTIES	method	limit/base	current	history1	history2

13.8

14.3

13.9

GRAPHS							
Iron (ppm)							Lead (ppm)
Severe							80 Severe
150 Abnormal							E 40 Abnormal
50+		ļ ļ -		^			20 - April 20
0 19 11	80 9	0 6	OZ	22	12	14	888888888888888888888888888888888888888
Aug26/16 Feb27/17 Oct11/17	Feb15/18	Juiz3/10 Apr12/19	Mar20/20	Sep9/22 -	Nov30/22	Mar28/24	Aug26/16 Feb27/17 Oct11/17 Feb15/18 Jul23/18 Apr12/19 Mar20/20 Sep9/22
Aluminum (_		~		_	_	Chromium (ppm)
Severe							50 Severe
30 Abnormal							70 7
The state of the s							E 30 Abnormal
10	_			$\widehat{}$	\	=	10
Aug26/16 Feb27/17	Feb15/18	Julz3/10	Mar20/20	Sep9/22	Nov30/22	Mar28/24	Aug26/16 Feb27/17 Oct11/17 Feb15/18 Jul23/18 Apr12/19 Sep9/22 Nov30/22
Copper (ppi	_	δ	Ž	03	No	Ž	ਭ ਵ ੦ ਵ ੨ ਵ ਡ ਂ ਂ ਤੋਂ ਤੋਂ Silicon (ppm)
Copper (ppi	111)						80 T Severe
300							60
200							Abnormal
0				i			20
Aug26/16 - Feb27/17 - Oct11/17 -	Feb15/18	Julz3/10 - Apr12/19 -	Mar20/20 -	Sep9/22 -	Nov30/22	Mar28/24	Aug28/16 - Cot11/17 - Cot11/17 - Feb15/18 - Feb15/18 - Apr12/19 - Apr12/19 - Sep9/22 -
Aug? Feb;	윤 .	Julz	Mar	Sel	Nov	Marí	4 2 2 2
Viscosity @	100°C						Base Number ©10.0 ⊤ Base
18 Abnormal		-			<u> </u>	-	Dasse Number (1010.0 Bass)
16 Base 14 Abnormal							E 6.0
Abnormal 12				i-			2.0
10 10 10	· ·	6	20+-	22	22 +-	24 🕂	Bass 10.0 19 18 18 17 17 17 18 18 18 19 19 19 19 19 19 19 19 19 19 19 19 19
Aug26/16 Feb27/17	Feb15/18	Julz3/10	Mar20/20	Sep9/22	Nov30/22	Mar28/24	Aug26/16 Feb27/17 Oct11/17 Feb15/18 Jul23/18 Apr12/19 Sep9/22 Nov30/22
A I		- 4	2		2	2	A





Laboratory Sample No.

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 : PCA0122083

Lab Number : 06137101 Unique Number : 10956566

Received **Tested**

: 03 Apr 2024 Diagnosed

: 03 Apr 2024 : 03 Apr 2024 - Wes Davis

K5 CONSTRUCTION CORPORATION 6301 S EAST AVENUE HODGKINS, IL

US 60525 Contact: Dave Gorski

daveg@k-five.net T: (630)257-5600

Test Package: MOB 1 (Additional Tests: TBN) To discuss this sample report, contact Customer Service at 1-800-237-1369.

Visc @ 100°C

cSt

ASTM D445 15.6

* - 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)

F: