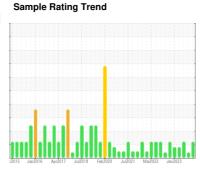


OIL ANALYSIS REPORT







DIAGNOSIS

Recommendation

The oil change at the time of sampling has been noted. We recommend an early resample to monitor this condition.

All component wear rates are normal.

Contamination

There is a moderate amount of fuel present in the oil. Tests confirm the presence of fuel in the oil.

Fluid Condition

The BN result indicates that there is suitable alkalinity remaining in the oil. Fuel is present in the oil and is lowering the viscosity. The oil is no longer serviceable due to the presence of contaminants.

Sample Date Client Info 09 Jan 2024 05 Sep 2023 27 Jun 2023	N SHP 15W40 (1	U GAL)	12015 Jan20	16 Apr2017 Jul2018	Feb2020 Jul2021 Mar2022	Jan 2023	
Sample Date	SAMPLE INFOR	MATION	method	limit/base	current	history1	history2
Machine Age hrs Client Info 24147 23553 23039 Dil Age hrs Client Info 785 785 785 Dil Age hrs Client Info 785 785 785 785 Dil Changed Changed Changed Changed Changed Changed ABNORMAL ATTENTION ABNORMAL ATTENTION ABNORMAL CONTAMINATION method limit/base current history1 history2 Water WC Method NEG NEG NEG NEG Glycol WC Method NEG NEG NEG NEG WEAR METALS method limit/base current history1 history2 Iron ppm ASTM 05185m >20 0 0 0 0 Chromium ppm ASTM 05185m >20 0 0 0 0 Nickel ppm ASTM 05185m >2 0 0 0 0 Nickel ppm ASTM 05185m >2 0 0 0 0 Silver ppm ASTM 05185m >2 0 0 0 0 Alturnirum ppm ASTM 05185m >2 0 0 0 0 Lead ppm ASTM 05185m >40 <1 0 0 0 Capper ppm ASTM 05185m >330 <1 <1 <1 <1 Candmium ppm ASTM 05185m >15 1 <1 <1 Candmium ppm ASTM 05185m >15 1 <1 <1 Candmium ppm ASTM 05185m 0 0 0 0 ADDITIVES method limit/base current history1 history2 Barium ppm ASTM 05185m 0 0 0 0 ADDITIVES method limit/base current history1 history2 Barium ppm ASTM 05185m 0 0 0 0 ADDITIVES method limit/base current history1 history2 Barium ppm ASTM 05185m 1010 776 874 844 Calcium ppm ASTM 05185m 1070 1017 1272 1116 Phosphorus ppm ASTM 05185m 1070 1100 1188 1183 Sulfur ppm ASTM 05185m 200 2 <1 Phosphorus p	Sample Number		Client Info		PCA0101781	PCA0101731	PCA0077299
Oil Age hrs Client Info 785 785 785 Oil Changed Client Info Changed	Sample Date		Client Info		09 Jan 2024	05 Sep 2023	27 Jun 2023
Colient Info	Machine Age	hrs	Client Info		24147	23553	23039
ABNORMAL	Oil Age	hrs	Client Info		785	785	785
ABNORMAL	Oil Changed		Client Info		Changed	Changed	Changed
Water WC Method >0.2 NEG NEG NEG NEG WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >120 4 5 4 Chromium ppm ASTM D5185m >20 0 0 <1 Nickel ppm ASTM D5185m >5 <1 0 <1 Titanium ppm ASTM D5185m >2 0 0 0 Silver ppm ASTM D5185m >2 0 0 0 Silver ppm ASTM D5185m >20 3 0 2 Caded ppm ASTM D5185m >40 <1 0 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	Sample Status				ABNORMAL	ATTENTION	
Glycol WC Method NEG NEG NEG WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >120 4 5 4 Chromium ppm ASTM D5185m >20 0 0 <1	CONTAMINAT	ION	method	limit/base	current	history1	history2
WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >120 4 5 4 Chromium ppm ASTM D5185m >20 0 0 <1	Water		WC Method	>0.2	NEG	NEG	NEG
Chromium	Glycol		WC Method		NEG	NEG	NEG
Chromium ppm ASTM D5185m >20 0 0 <1 Nickel ppm ASTM D5185m >5 <1	WEAR METAL	S	method	limit/base	current	history1	history2
Nickel	Iron	ppm	ASTM D5185m	>120	4	5	4
Titanium ppm ASTM D5185m >2 0 0 0 Silver ppm ASTM D5185m >2 0 0 0 Aluminum ppm ASTM D5185m >20 3 0 2 Lead ppm ASTM D5185m >40 <1 0 0 Copper ppm ASTM D5185m >330 <1 <1 <1 Vanadium ppm ASTM D5185m >15 1 <1 <1 0 Cadmium ppm ASTM D5185m 0 0 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 5 10 12 Boron ppm ASTM D5185m 0 5 10 12 Boron ppm ASTM D5185m 0 0 0 0 Molybdenum ppm ASTM D5185m 0 <th< td=""><td>Chromium</td><td>ppm</td><td>ASTM D5185m</td><td>>20</td><th>0</th><td>0</td><td><1</td></th<>	Chromium	ppm	ASTM D5185m	>20	0	0	<1
Silver	Nickel	ppm	ASTM D5185m	>5	<1	0	<1
Aluminum	Titanium	ppm	ASTM D5185m	>2	0	0	0
Lead ppm ASTM D5185m >40 <1 0 0 Copper ppm ASTM D5185m >330 <1 <1 <1 Tin ppm ASTM D5185m >15 1 <1 <1 Vanadium ppm ASTM D5185m 0 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 5 10 12 Barium ppm ASTM D5185m 0 0 0 0 Molybdenum ppm ASTM D5185m 0 63 70 64 Manganese ppm ASTM D5185m 0 <1 <1 <1 <1 Magnesium ppm ASTM D5185m 0 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1	Silver	ppm	ASTM D5185m	>2	0	0	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 <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 <td>Aluminum</td> <td>ppm</td> <td>ASTM D5185m</td> <td>>20</td> <th>3</th> <td>0</td> <td>2</td>	Aluminum	ppm	ASTM D5185m	>20	3	0	2
Tin ppm ASTM D5185m >15 1 <1 <1 <0 <0 <0 <0 <0 <0 <0 <0 <0 <0 <0 <0 <0	Lead	ppm	ASTM D5185m	>40	<1	0	0
Vanadium ppm ASTM D5185m <1 <1 0 Cadmium ppm ASTM D5185m 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 5 10 12 Barium ppm ASTM D5185m 0 0 0 0 Molybdenum ppm ASTM D5185m 0 <1 <1 <1 Manganese ppm ASTM D5185m 0 <1 <1 <1 Magnesium ppm ASTM D5185m 1070 1017 1272 1116 Phosphorus ppm ASTM D5185m 1270 1100 1188 1183 Sulfur ppm ASTM D5185m 1270 1100 1188 1183 Sulfur ppm ASTM D5185m 2060 2743 3516 3562 CONTAMINANTS method limit/base current history1	Copper	ppm	ASTM D5185m	>330	<1	<1	<1
Cadmium ppm ASTM D5185m 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 5 10 12 Barium ppm ASTM D5185m 0 0 0 0 Molybdenum ppm ASTM D5185m 60 63 70 64 Manganese ppm ASTM D5185m 0 <1	Tin	ppm	ASTM D5185m	>15	1	<1	<1
ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 5 10 12 Barium ppm ASTM D5185m 0 0 0 0 Molybdenum ppm ASTM D5185m 0 <1	Vanadium	ppm	ASTM D5185m		<1	<1	0
Boron	Cadmium	ppm	ASTM D5185m		0	0	0
Barium ppm ASTM D5185m 0 0 0 0 Molybdenum ppm ASTM D5185m 60 63 70 64 Manganese ppm ASTM D5185m 0 <1 <1 <1 Magnesium ppm ASTM D5185m 1010 776 874 844 Calcium ppm ASTM D5185m 1070 1017 1272 1116 Phosphorus ppm ASTM D5185m 1150 895 970 967 Zinc ppm ASTM D5185m 1270 1100 1188 1183 Sulfur ppm ASTM D5185m 2060 2743 3516 3562 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 7 4 3 Sodium ppm ASTM D5185m 19 3 <1 Potassium ppm ASTM D5185m 20 <th>ADDITIVES</th> <th></th> <th>method</th> <th>limit/base</th> <th>current</th> <th>history1</th> <th>history2</th>	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum ppm ASTM D5185m 60 63 70 64 Manganese ppm ASTM D5185m 0 <1 <1 <1 Magnesium ppm ASTM D5185m 1010 776 874 844 Calcium ppm ASTM D5185m 1070 1017 1272 1116 Phosphorus ppm ASTM D5185m 1070 1017 1272 1116 Phosphorus ppm ASTM D5185m 1270 1100 1188 1183 Sulfur ppm ASTM D5185m 2060 2743 3516 3562 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m 225 7 4 3 Sodium ppm ASTM D5185m 20 0 2 <1 Fuel % ASTM D5185m >20 0 2 <1 Fuel % ASTM D7844 <t< td=""><td>Boron</td><td>ppm</td><td>ASTM D5185m</td><td>0</td><th>5</th><td>10</td><td>12</td></t<>	Boron	ppm	ASTM D5185m	0	5	10	12
Manganese ppm ASTM D5185m 0 <1 <1 <1 Magnesium ppm ASTM D5185m 1010 776 874 844 Calcium ppm ASTM D5185m 1070 1017 1272 1116 Phosphorus ppm ASTM D5185m 1150 895 970 967 Zinc ppm ASTM D5185m 1270 1100 1188 1183 Sulfur ppm ASTM D5185m 2060 2743 3516 3562 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m 225 7 4 3 Sodium ppm ASTM D5185m 20 0 2 4 Fuel % ASTM D5185m >20 0 2 4 Soot % % ASTM D5185m >20 0 2 1 Fuel % ASTM D5185m >4	Barium	ppm	ASTM D5185m	0	0	0	0
Magnesium ppm ASTM D5185m 1010 776 874 844 Calcium ppm ASTM D5185m 1070 1017 1272 1116 Phosphorus ppm ASTM D5185m 1150 895 970 967 Zinc ppm ASTM D5185m 1270 1100 1188 1183 Sulfur ppm ASTM D5185m 2060 2743 3516 3562 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 7 4 3 Sodium ppm ASTM D5185m >20 0 2 <1	Molybdenum	ppm	ASTM D5185m	60	63	70	64
Calcium ppm ASTM D5185m 1070 1017 1272 1116 Phosphorus ppm ASTM D5185m 1150 895 970 967 Zinc ppm ASTM D5185m 1270 1100 1188 1183 Sulfur ppm ASTM D5185m 2060 2743 3516 3562 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 7 4 3 Sodium ppm ASTM D5185m >20 0 2 <1	Manganese	ppm	ASTM D5185m	0	<1	<1	<1
Phosphorus ppm ASTM D5185m 1150 895 970 967 Zinc ppm ASTM D5185m 1270 1100 1188 1183 Sulfur ppm ASTM D5185m 2060 2743 3516 3562 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 7 4 3 Sodium ppm ASTM D5185m >20 0 2 <1	Magnesium	ppm	ASTM D5185m	1010	776	874	844
Zinc ppm ASTM D5185m 1270 1100 1188 1183 Sulfur ppm ASTM D5185m 2060 2743 3516 3562 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 7 4 3 Sodium ppm ASTM D5185m >20 0 2 <1	Calcium	ppm	ASTM D5185m	1070	1017	1272	1116
Sulfur ppm ASTM D5185m 2060 2743 3516 3562 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 7 4 3 Sodium ppm ASTM D5185m 19 3 <1	Phosphorus	ppm	ASTM D5185m	1150	895	970	967
CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 7 4 3 Sodium ppm ASTM D5185m 19 3 <1	Zinc	ppm	ASTM D5185m	1270	1100	1188	1183
Silicon ppm ASTM D5185m >25 7 4 3 Sodium ppm ASTM D5185m 19 3 <1 Potassium ppm ASTM D5185m >20 0 2 <1 Fuel % ASTM D3524 >3.0 ▲ 4.8 0.5 ▲ 3.8 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >4 0.1 0.1 0.1 0.1 Nitration Abs/cm *ASTM D7624 >20 8.2 6.8 7.3 Sulfation Abs/.1mm *ASTM D7415 >30 18.5 16.8 18.6 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 14.1 12.4 15.6	Sulfur	ppm	ASTM D5185m	2060	2743	3516	3562
Sodium ppm ASTM D5185m 19 3 <1 Potassium ppm ASTM D5185m >20 0 2 <1	CONTAMINAN	TS	method	limit/base	current	history1	history2
Potassium ppm ASTM D5185m >20 0 2 <1 Fuel % ASTM D3524 >3.0 ▲ 4.8 0.5 ▲ 3.8 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >4 0.1 0.1 0.1 Nitration Abs/cm *ASTM D7624 >20 8.2 6.8 7.3 Sulfation Abs/.1mm *ASTM D7415 >30 18.5 16.8 18.6 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 14.1 12.4 15.6	Silicon	ppm	ASTM D5185m	>25	7	4	3
Fuel % ASTM D3524 >3.0 ▲ 4.8 0.5 ▲ 3.8 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >4 0.1 0.1 0.1 Nitration Abs/cm *ASTM D7624 >20 8.2 6.8 7.3 Sulfation Abs/.1mm *ASTM D7415 >30 18.5 16.8 18.6 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 14.1 12.4 15.6	Sodium	ppm	ASTM D5185m		19	3	<1
INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >4 0.1 0.1 0.1 Nitration Abs/cm *ASTM D7624 >20 8.2 6.8 7.3 Sulfation Abs/.1mm *ASTM D7415 >30 18.5 16.8 18.6 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 14.1 12.4 15.6	Potassium	ppm	ASTM D5185m	>20	0	2	<1
Soot % *ASTM D7844 >4 0.1 0.1 0.1 Nitration Abs/cm *ASTM D7624 >20 8.2 6.8 7.3 Sulfation Abs/.1mm *ASTM D7415 >30 18.5 16.8 18.6 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 14.1 12.4 15.6	Fuel	%	ASTM D3524	>3.0	4.8	0.5	▲ 3.8
Nitration Abs/cm *ASTM D7624 >20 8.2 6.8 7.3 Sulfation Abs/.1mm *ASTM D7415 >30 18.5 16.8 18.6 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 14.1 12.4 15.6	INFRA-RED		method	limit/base	current	history1	history2
Nitration Abs/cm *ASTM D7624 > 20 8.2 6.8 7.3 Sulfation Abs/.1mm *ASTM D7415 > 30 18.5 16.8 18.6 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 > 25 14.1 12.4 15.6	Soot %	%	*ASTM D7844	>4	0.1	0.1	0.1
Sulfation Abs/.1mm *ASTM D7415 >30 18.5 16.8 18.6 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 14.1 12.4 15.6	Nitration	Abs/cm	*ASTM D7624	>20	8.2	6.8	7.3
Oxidation Abs/.1mm *ASTM D7414 >25 14.1 12.4 15.6	Sulfation						
	FLUID DEGRAI	DATION	method	limit/base	current	history1	history2
	Ovidation	Ahs/1mm	*ΔSTM D7414	\25	141	10.4	15.6
	Oxidation		AOTIVI DITTI	<i>></i> _0	14.1	12.4	13.0



Base Number

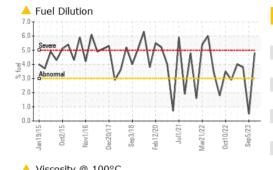
10.0

(mg KOH/g)

Base

0.0

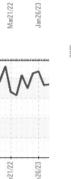
OIL ANALYSIS REPORT



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
Sand/Dirt Appearance Odor Emulsified Water	scalar scalar scalar scalar	*Visual *Visual *Visual *Visual	NONE NORML NORML	NONE NORML NORML NEG	NONE NORML NORML NEG	NONE NORML NORML NEG

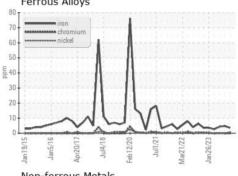
²⁰ T		@ 100					
18 - Abnom	mal						
16 - Base			-				
14 Abnor	mal					A	~
10-	\sim	<u> </u>	^^	\nearrow		\sim	V
8							
Jan19/15	Jan5/16	71/02	Jul4/18	12/20	ul1/21	21/22	lan26/23
Jan	-	Apr2	5	균	_	Mar2	Jan

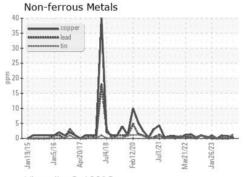


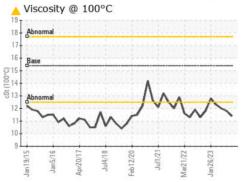


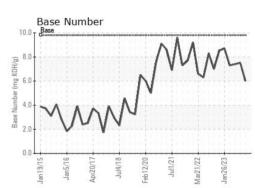
Ferrous Alloys

GRAPHS













Certificate L2367

Laboratory Sample No.

Lab Number **Unique Number**

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 : PCA0101781 : 06057869 : 10829251

Recieved Diagnosed Diagnostician : Wes Davis

: 11 Jan 2024 : 15 Jan 2024

Test Package : FLEET (Additional Tests: FuelDilution, PercentFuel) 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)

GFL Environmental - 002 - Vance-Granville

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Contact: Cameron King cameron.king@gflenv.com

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