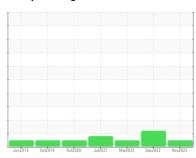


OIL ANALYSIS REPORT

Sample Rating Trend







Machine Id
2514
Component
Diesel Eng

Diesel Engine

PETRO CANADA 15W40 (--- GAL)

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-	$I \cap$	u	N	v	${\boldsymbol{\circ}}$	ı

Recommendation

Resample at the next service interval to monitor. Please specify the component make and model with your next sample.

Wear

All component wear rates are normal.

Contamination

There is no indication of any contamination in the oil.

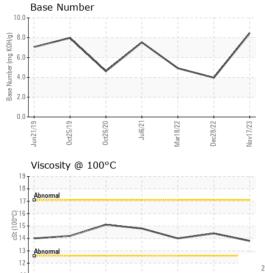
Fluid Condition

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

Sample Date Client Info 17 Nov 2023 28 Dec 2022 18 Mar 2022 Machine Age hrs Client Info 0 613 600 614			Jun2019	Oct2019 Oct2020	Jul2021 Mar2022 Dec2022	Nov2023	
Sample Date	SAMPLE INFORM	IATION	method	limit/base	current	history1	history2
Machine Age hrs Client Info O	Sample Number		Client Info		RW0004661	RW0004113	RW0003148
Oil Age hrs Client Info 0 613 600 Oil Changed Sample Status Client Info Changed Changed Changed Changed Changed NORMAL Changed NORMAL Changed NORMAL NORMAL CONTAMINATION method limit/base current history1 history2 Fuel WC Method >5 <1.0 <1.0 <1.0 Water WC Method NEG NEG NEG Glycol WC Method NEG NEG NEG WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >10 13 50 28 Chromium ppm ASTM D5185m >20 <1 1 <1 <1 Nickel ppm ASTM D5185m >3 0 0 <1 2 Silver ppm ASTM D5185m >4 <1 <1 <1 <1 Lead ppm ASTM D5185m >30 0	Sample Date		Client Info		17 Nov 2023	28 Dec 2022	18 Mar 2022
Client Info Changed Changed Changed NORMAL NORMAL NORMAL NORMAL NORMAL	Machine Age	hrs	Client Info		5476	4626	3764
NORMAL ABNORMAL NORMAL	Oil Age	hrs	Client Info		0	613	600
Fuel	Oil Changed		Client Info		Changed	Changed	Changed
Fuel	Sample Status				NORMAL	ABNORMAL	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 13 50 28 Chromium ppm ASTM D5185m >4 <1 <1 <1 Nickel ppm ASTM D5185m >4 <1 <1 0 Titanium ppm ASTM D5185m >4 <1 <1 0 Silver ppm ASTM D5185m >3 0 0 0 0 Silver ppm ASTM D5185m >3 0 0 <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	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 13 50 28 Chromium ppm ASTM D5185m >20 <1 1 <1 <1 Nickel ppm ASTM D5185m >20 <1 <1 0 Titanium ppm ASTM D5185m >3 0 0 <1 2 Silver ppm ASTM D5185m >3 0 0 0 A 4 1 2 4 5 4 4 1 2 4 5 4 4 1	Water		WC Method	>0.2	NEG	NEG	NEG
Iron	Glycol		WC Method		NEG	NEG	NEG
Chromium	WEAR METALS		method	limit/base	current	history1	history2
Nickel	Iron	ppm	ASTM D5185m	>100	13	50	28
Titanium	Chromium	ppm	ASTM D5185m	>20	<1	1	<1
Silver	Nickel	ppm	ASTM D5185m	>4	<1	<1	0
Aluminum ppm ASTM D5185m >20 4 5 4 Lead ppm ASTM D5185m >40 0 <1 <1 Copper ppm ASTM D5185m >330 <1 1 1 Tin ppm ASTM D5185m >15 <1 <1 <1 Antimony ppm ASTM D5185m 0 <1 0 0 Vanadium ppm ASTM D5185m 0 <1 0 0 Cadmium ppm ASTM D5185m 0 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 35 98 239 Barium ppm ASTM D5185m 0 0 0 Molybdenum ppm ASTM D5185m 41 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <th>Titanium</th> <th>ppm</th> <th>ASTM D5185m</th> <th></th> <th>0</th> <th><1</th> <th>2</th>	Titanium	ppm	ASTM D5185m		0	<1	2
Lead	Silver	ppm	ASTM D5185m	>3	0	0	0
Copper ppm ASTM D5185m >330 -1 1 1 Tin ppm ASTM D5185m >15 <1 <1 <1 Antimony ppm ASTM D5185m Vanadium ppm ASTM D5185m 0 <1 0 Cadmium ppm ASTM D5185m 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 35 98 239 Barium ppm ASTM D5185m 0 0 0 Molybdenum ppm ASTM D5185m 0 88 81 Manganese ppm ASTM D5185m 21 <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 <th>Aluminum</th> <th>ppm</th> <th>ASTM D5185m</th> <th>>20</th> <th>4</th> <th>5</th> <th>4</th>	Aluminum	ppm	ASTM D5185m	>20	4	5	4
Tin	Lead	ppm	ASTM D5185m	>40	0	<1	<1
Antimony	Copper	ppm	ASTM D5185m	>330	<1	1	1
Vanadium ppm ASTM D5185m 0 <1	Tin	ppm	ASTM D5185m	>15	<1	<1	<1
Cadmium ppm ASTM D5185m 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 35 98 239 Barium ppm ASTM D5185m 0 0 0 Molybdenum ppm ASTM D5185m 80 88 81 Manganese ppm ASTM D5185m <1 <1 <1 <1 Magnesium ppm ASTM D5185m 123 422 478 Calcium ppm ASTM D5185m 2015 1655 1530 Phosphorus ppm ASTM D5185m 1096 1112 1074 Zinc ppm ASTM D5185m 3549 3767 2870 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m 25 5 12 6 Sodium	Antimony	ppm	ASTM D5185m				
ADDITIVES	Vanadium	ppm	ASTM D5185m		0	<1	0
Boron	Cadmium	ppm	ASTM D5185m		0	0	0
Barium ppm ASTM D5185m 0 0 0 Molybdenum ppm ASTM D5185m 80 88 81 Manganese ppm ASTM D5185m <1 <1 <1 Magnesium ppm ASTM D5185m 123 422 478 Calcium ppm ASTM D5185m 2015 1655 1530 Phosphorus ppm ASTM D5185m 1096 1112 1074 Zinc ppm ASTM D5185m 3549 3767 2870 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 5 12 6 Sodium ppm ASTM D5185m >20 4 6 4 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.7 1.5 1.3 Nitration Abs/.1mm <	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum ppm ASTM D5185m 80 88 81 Manganese ppm ASTM D5185m <1 <1 <1 Magnesium ppm ASTM D5185m 123 422 478 Calcium ppm ASTM D5185m 2015 1655 1530 Phosphorus ppm ASTM D5185m 1096 1112 1074 Zinc ppm ASTM D5185m 1215 1419 1282 Sulfur ppm ASTM D5185m 3549 3767 2870 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 5 12 6 Sodium ppm ASTM D5185m >20 4 6 4 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7624 >20 11.5 14.1 11.0 Sulfation Abs/.1mm </th <th>Boron</th> <th>ppm</th> <th>ASTM D5185m</th> <th></th> <th>35</th> <th>98</th> <th>239</th>	Boron	ppm	ASTM D5185m		35	98	239
Manganese ppm ASTM D5185m <1	Barium	ppm	ASTM D5185m		0	0	0
Magnesium ppm ASTM D5185m 123 422 478 Calcium ppm ASTM D5185m 2015 1655 1530 Phosphorus ppm ASTM D5185m 1096 1112 1074 Zinc ppm ASTM D5185m 1215 1419 1282 Sulfur ppm ASTM D5185m 3549 3767 2870 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m 25 5 12 6 Sodium ppm ASTM D5185m 20 4 6 4 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.7 1.5 1.3 Nitration Abs/.1mm *ASTM D7624 >20 11.5 14.1 11.0 Sulfation Abs/.1mm *ASTM D7415 >30 20.9 31.8 27.2	Molybdenum	ppm	ASTM D5185m		80	88	81
Calcium ppm ASTM D5185m 2015 1655 1530 Phosphorus ppm ASTM D5185m 1096 1112 1074 Zinc ppm ASTM D5185m 1215 1419 1282 Sulfur ppm ASTM D5185m 3549 3767 2870 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 5 12 6 Sodium ppm ASTM D5185m 2 2 2 2 Potassium ppm ASTM D5185m >20 4 6 4 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.7 1.5 1.3 Nitration Abs/.1mm *ASTM D7624 >20 11.5 14.1 11.0 Sulfation Abs/.1mm *ASTM D7415 >30 20.9 31.8 27.2 </th <th>Manganese</th> <th>ppm</th> <th>ASTM D5185m</th> <th></th> <th><1</th> <th><1</th> <th><1</th>	Manganese	ppm	ASTM D5185m		<1	<1	<1
Phosphorus ppm ASTM D5185m 1096 1112 1074 Zinc ppm ASTM D5185m 1215 1419 1282 Sulfur ppm ASTM D5185m 3549 3767 2870 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 5 12 6 Sodium ppm ASTM D5185m 2 2 2 2 Potassium ppm ASTM D5185m >20 4 6 4 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.7 1.5 1.3 Nitration Abs/.1mm *ASTM D7415 >30 20.9 31.8 27.2 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 17.1	Magnesium	ppm	ASTM D5185m		123	422	478
Zinc ppm ASTM D5185m 1215 1419 1282 Sulfur ppm ASTM D5185m 3549 3767 2870 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 5 12 6 Sodium ppm ASTM D5185m 2 2 2 2 Potassium ppm ASTM D5185m >20 4 6 4 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.7 1.5 1.3 Nitration Abs/cm *ASTM D7624 >20 11.5 14.1 11.0 Sulfation Abs/.1mm *ASTM D7415 >30 20.9 31.8 27.2 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 17.1	Calcium	ppm	ASTM D5185m		2015	1655	1530
Sulfur ppm ASTM D5185m 3549 3767 2870 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 5 12 6 Sodium ppm ASTM D5185m 2 2 2 2 Potassium ppm ASTM D5185m >20 4 6 4 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.7 1.5 1.3 Nitration Abs/cm *ASTM D7624 >20 11.5 14.1 11.0 Sulfation Abs/.1mm *ASTM D7415 >30 20.9 31.8 27.2 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 17.1 27.7 21.5	Phosphorus	ppm	ASTM D5185m		1096	1112	1074
CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 5 12 6 Sodium ppm ASTM D5185m 2 2 2 2 Potassium ppm ASTM D5185m >20 4 6 4 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.7 1.5 1.3 Nitration Abs/cm *ASTM D7624 >20 11.5 14.1 11.0 Sulfation Abs/.1mm *ASTM D7415 >30 20.9 31.8 27.2 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 17.1 27.7 21.5	Zinc	ppm	ASTM D5185m		-	1419	1282
Silicon ppm ASTM D5185m >25 5 12 6 Sodium ppm ASTM D5185m 2 2 2 2 Potassium ppm ASTM D5185m >20 4 6 4 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.7 1.5 1.3 Nitration Abs/cm *ASTM D7624 >20 11.5 14.1 11.0 Sulfation Abs/.1mm *ASTM D7415 >30 20.9 31.8 27.2 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 17.1 27.7 21.5	Sulfur	ppm	ASTM D5185m		3549	3767	2870
Sodium ppm ASTM D5185m 2 2 2 2 Potassium ppm ASTM D5185m >20 4 6 4 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.7 1.5 1.3 Nitration Abs/cm *ASTM D7624 >20 11.5 14.1 11.0 Sulfation Abs/.1mm *ASTM D7415 >30 20.9 31.8 27.2 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 17.1 27.7 21.5	CONTAMINANTS		method	limit/base	current	history1	history2
Potassium ppm ASTM D5185m >20 4 6 4 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.7 1.5 1.3 Nitration Abs/cm *ASTM D7624 >20 11.5 14.1 11.0 Sulfation Abs/.1mm *ASTM D7415 >30 20.9 31.8 27.2 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 17.1 27.7 21.5	Silicon	ppm	ASTM D5185m	>25	5	12	6
INFRA-RED	Sodium	ppm	ASTM D5185m		2	2	2
Soot % % *ASTM D7844 >3 0.7 1.5 1.3 Nitration Abs/cm *ASTM D7624 >20 11.5 14.1 11.0 Sulfation Abs/.1mm *ASTM D7415 >30 20.9 31.8 27.2 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 17.1 27.7 21.5	Potassium	ppm	ASTM D5185m	>20	4	6	4
Nitration Abs/cm *ASTM D7624 >20 11.5 14.1 11.0 Sulfation Abs/.1mm *ASTM D7415 >30 20.9 31.8 27.2 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 17.1 27.7 21.5	INFRA-RED		method	limit/base	current	history1	history2
Sulfation Abs/.1mm *ASTM D7415 >30 20.9 31.8 27.2 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 17.1 27.7 21.5	Soot %	%	*ASTM D7844	>3	0.7	1.5	1.3
FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 17.1 27.7 21.5	Nitration	Abs/cm	*ASTM D7624	>20	11.5	14.1	11.0
Oxidation Abs/.1mm *ASTM D7414 >25 17.1 27.7 21.5	Sulfation	Abs/.1mm	*ASTM D7415	>30	20.9	31.8	27.2
	FLUID DEGRADA	TION	method	limit/base	current	history1	history2
Base Number (BN) mg K0H/g ASTM D2896 8.45 ▲ 3.96 4.92	Oxidation	Abs/.1mm	*ASTM D7414	>25	17.1	27.7	21.5
	Base Number (BN)	mg KOH/g	ASTM D2896		8.45	▲ 3.96	4.92



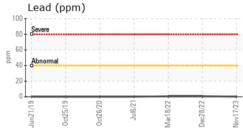
OIL ANALYSIS REPORT

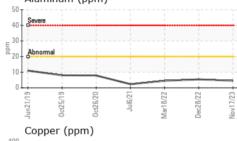


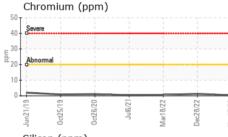
VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual	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
FLUID DDODEDI			11 11 11		111	1
FLUID PROPERT	method				history2	

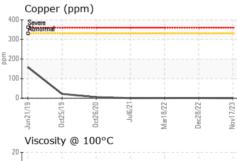
Visc @ 100°C	cSt	ASTM D445	13.8	14.4	14.0

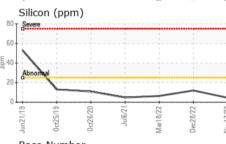
Iron	(ppm)					
Severe						
E 150	mal					
Jun21/19	0ct25/19 +	0ct26/20	Jul6/21-	Mar18/22 +	Dec28/22 -	Nov17/23
Alur	ninum	(ppm)				

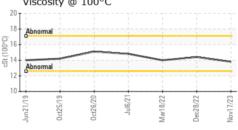


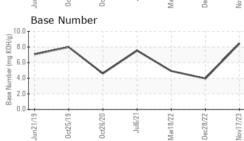














Certificate L2367

Laboratory Sample No. Lab Number Test Package : MOB 2

Unique Number

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 : RW0004661 : 06016659 : 10755803

Received Diagnosed Diagnostician

: 24 Nov 2023 : 28 Nov 2023 : Wes Davis

NEWKIRK ELECTRIC 1875 ROBERTS ST. MUSKEGON, MI US 49442 Contact: ERIC KING ewking@newkirk-electric.com

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)

Contact/Location: ERIC KING - NEWMUS

T: (231)206-6131

F: (231)724-4090