MAR III

WEAR CHECK

OIL ANALYSIS REPORT

WEAR	NORMAL
CONTAMINANTS	NORMAL
OIL CONDITION	NORMAL

Area
Propulsion/Salle des Machines
Machine Id
12A02#06 (S/N M4112-R)
Component
6 Diesel Engine
Fluid
PETRO CANADA RALUBE 40 CFS (720 LTR)

RECOMMENDATION

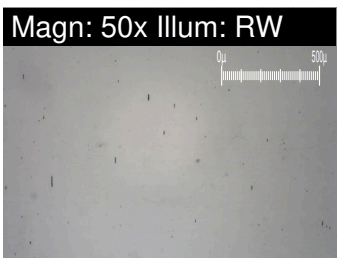
Resample at the next service interval to monitor.

WEAR

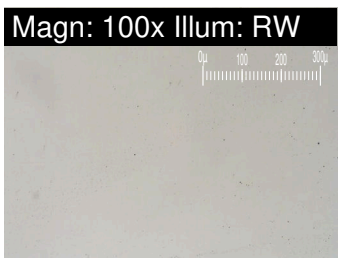
All component wear rates are normal. The ferrography results are normal indicating no abnormal wear in the system.

Magn: 200x Illum: BC

Magn: 50x Illum: RW



Magn: 100x Illum: RW



Test	UOM	Method	Limit/Abn	Current	History1	History2
Sample Number		Client Info		WC0751423	WC0751395	WC
Sample Date		Client Info		23 Oct 2023	01 Apr 2023	18 Oct 2022
Machine Age	hrs	Client Info		15035	14049	13657
Oil Age	hrs	Client Info		896	677	285
Filter Age	hrs	Client Info		896	677	285
Oil Changed		Client Info		Not Changd	Not Changd	Not Changd
Filter Changed		Client Info		N/A	Not Changd	Not Changd
Sample Status				NORMAL	NORMAL	NORMAL
PQ		ASTM D8184*		0	0	---
Iron	ppm	ASTM D5185(m)	>100	5	6	5
Chromium	ppm	ASTM D5185(m)	>20	0	<1	<1
Nickel	ppm	ASTM D5185(m)	>4	<1	<1	0
Titanium	ppm	ASTM D5185(m)		0	0	0
Silver	ppm	ASTM D5185(m)	>3	<1	0	0
Aluminum	ppm	ASTM D5185(m)	>20	2	2	1
Lead	ppm	ASTM D5185(m)	>40	<1	<1	0
Copper	ppm	ASTM D5185(m)	>330	<1	<1	<1
Tin	ppm	ASTM D5185(m)	>15	0	<1	<1
Vanadium	ppm	ASTM D5185(m)		0	0	0
Large Particles		DR-Ferr*		3.2	5.1	---
Small Particles		DR-Ferr*		2.2	3.6	---
Total Particles		DR-Ferr*	>---	5.4	8.7	---
Large Particles Percentage	%	DR-Ferr*		18.5	17.2	---
Severity Index		DR-Ferr*		3	8	---
Ferrous Rubbing	Scale 0-10	ASTM D7684*		1	2	
Ferrous Sliding	Scale 0-10	ASTM D7684*				
Ferrous Cutting	Scale 0-10	ASTM D7684*				
Ferrous Rolling	Scale 0-10	ASTM D7684*		1	1	
Ferrous Break-in	Scale 0-10	ASTM D7684*				
Ferrous Spheres	Scale 0-10	ASTM D7684*				
Ferrous Black Oxides	Scale 0-10	ASTM D7684*		1		
Ferrous Red Oxides	Scale 0-10	ASTM D7684*				
Ferrous Corrosive	Scale 0-10	ASTM D7684*				
Ferrous Other	Scale 0-10	ASTM D7684*				
Nonferrous Rubbing	Scale 0-10	ASTM D7684*				
Nonferrous Sliding	Scale 0-10	ASTM D7684*				
Nonferrous Cutting	Scale 0-10	ASTM D7684*				
Nonferrous Rolling	Scale 0-10	ASTM D7684*				
Nonferrous Other	Scale 0-10	ASTM D7684*				

CONTAMINANTS

There is no indication of any contamination in the oil.

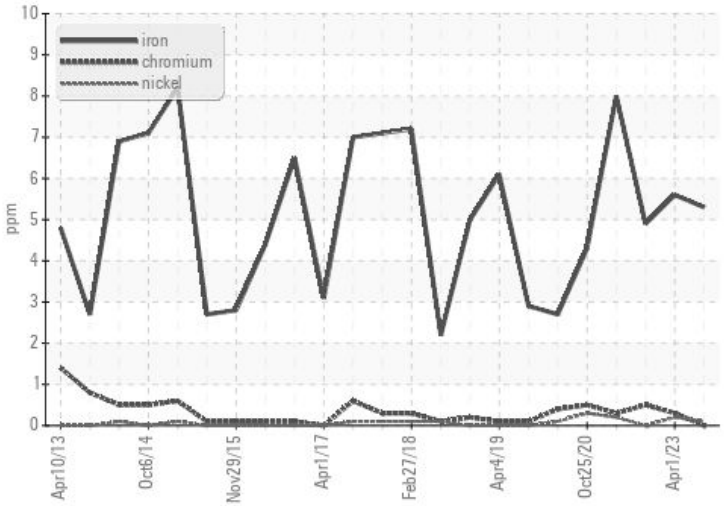
Silicon	ppm	ASTM D5185(m)	>25	**3**	5	6
Potassium	ppm	ASTM D5185(m)	>20	**<1**	3	1
Fuel		WC Method	>5	**<1.0**	<1.0	<1.0
Water		WC Method	>0.2	**NEG**	NEG	NEG
Glycol		WC Method		**NEG**	NEG	NEG
Soot %	%	ASTM D7844*	>2	**0**	0	0
Nitration	Abs/cm	ASTM D7624*	>20	**12.4**	11.8	11.2
Sulfation	Abs/.1mm	ASTM D7415*	>30	**14.6**	14.2	14.6
Emulsified Water	scalar	Visual*	>0.2	**NEG**	NEG	NEG
Carbonaceous Material	Scale 0-10	ASTM D7684*				
Sand/Dirt	Scale 0-10	ASTM D7684*		**1**	1	
Fibres	Scale 0-10	ASTM D7684*				
Spheres	Scale 0-10	ASTM D7684*				
Other	Scale 0-10	ASTM D7684*		**1**	1	

OIL CONDITION

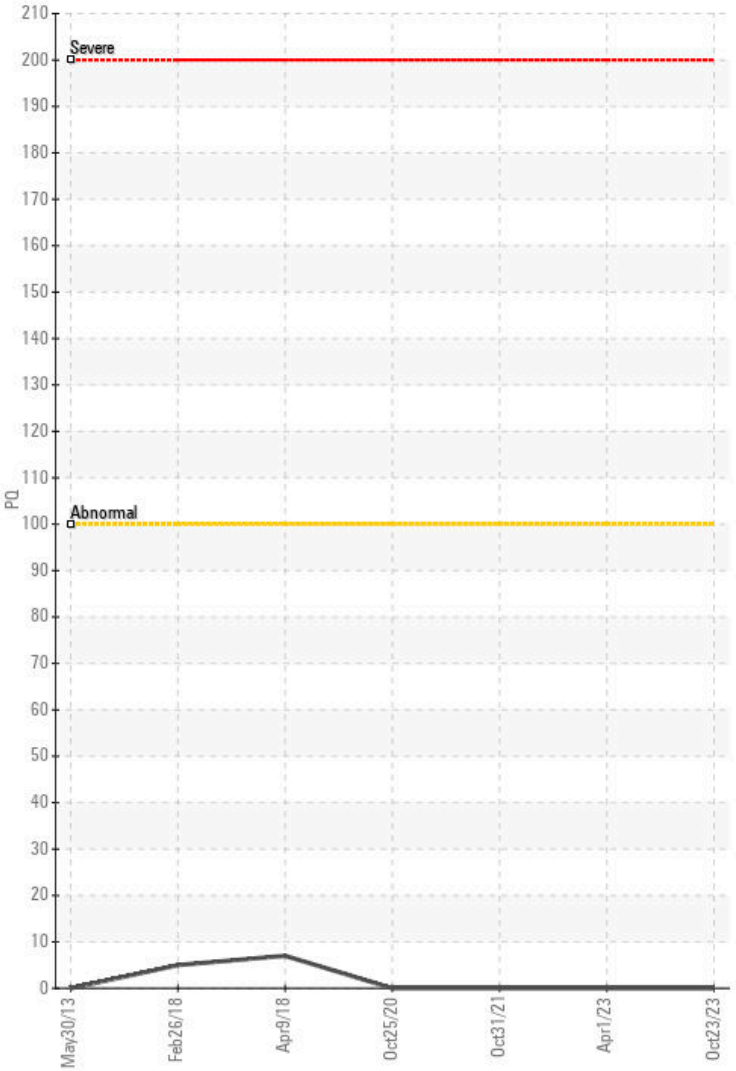
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

Sodium	ppm	ASTM D5185(m)		**4**	14	7
Boron	ppm	ASTM D5185(m)	0	**<1**	3	1
Barium	ppm	ASTM D5185(m)	0	**<1**	0	0
Molybdenum	ppm	ASTM D5185(m)	0	**0**	<1	<1
Manganese	ppm	ASTM D5185(m)	0	**0**	<1	<1
Magnesium	ppm	ASTM D5185(m)	25	**17**	22	21
Calcium	ppm	ASTM D5185(m)	4300	**4670**	4735	4785
Phosphorus	ppm	ASTM D5185(m)	1.6	**4**	4	4
Zinc	ppm	ASTM D5185(m)	2	**5**	5	6
Sulfur	ppm	ASTM D5185(m)	1500	**3057**	3106	2991
Oxidation	Abs/.1mm	ASTM D7414*	>25	**10.4**	10.2	10.0
Base Number (BN)	mg KOH/g	ASTM D2896*	14.0	**13.65**	13.59	---
Visc @ 100°C	cSt	ASTM D7279(m)	14.8	**14.7**	14.6	14.8
Lubricant Degradation	Scale 0-10	ASTM D7684*				

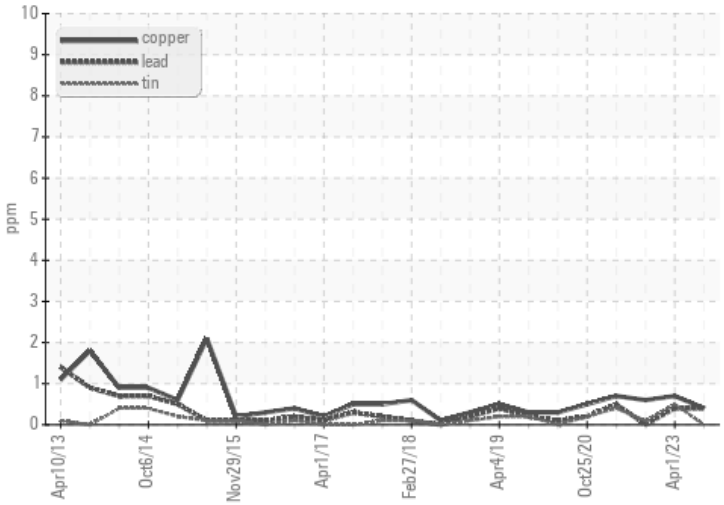
Ferrous Alloys



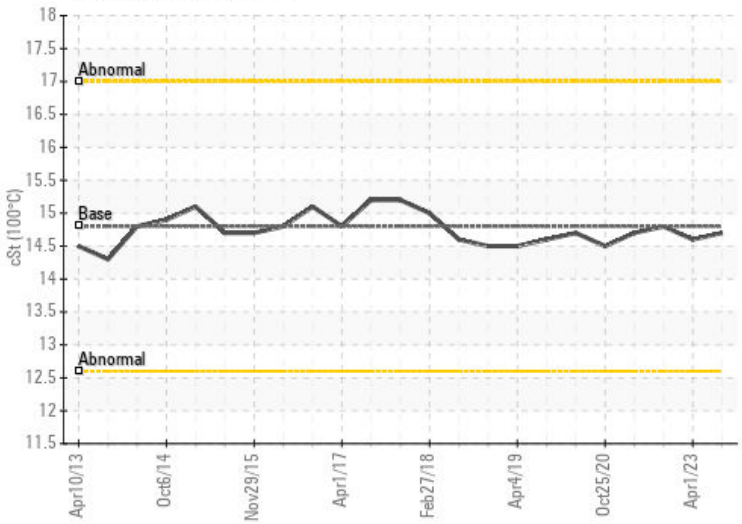
PQ



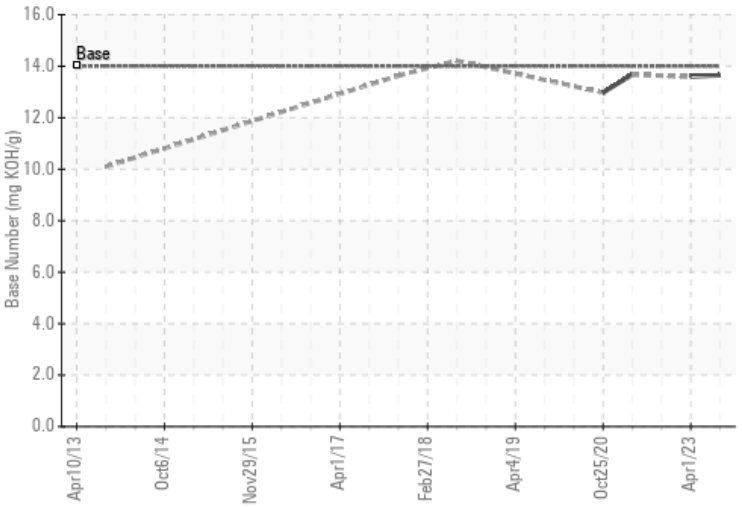
Non-ferrous Metals



Viscosity @ 100°C



Base Number



ISO 17025:2017 Accredited Laboratory

Laboratory	: WearCheck - C8-1175 Appleby Line, Burlington, ON L7L 5H9		
Sample No.	: WC0751423	**Received**	: 01 Nov 2023
Lab Number	: 02593084	**Tested**	: 03 Nov 2023
Unique Number	: 5670163	**Diagnosed**	: 03 Nov 2023 - Kevin Marson
Test Package	: MAR 3		

To discuss this sample report, contact Customer Service at 1-800-268-2131.
Test denoted (*) outside scope of accreditation, (m) method modified, (e) tested at external lab.
Validity of results and interpretation are based on the sample and information as supplied.

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