MAR III

WEAR CHECK

OIL ANALYSIS REPORT

WEAR	ABNORMAL
CONTAMINANTS	ABNORMAL
OIL CONDITION	NORMAL

Machine Id
12D04#01A - Port Thrust Block (S/N 91257-P8)
Component
Bearing
Fluid
PETRO CANADA HARMONY AW 100 (124 LTR)

RECOMMENDATION

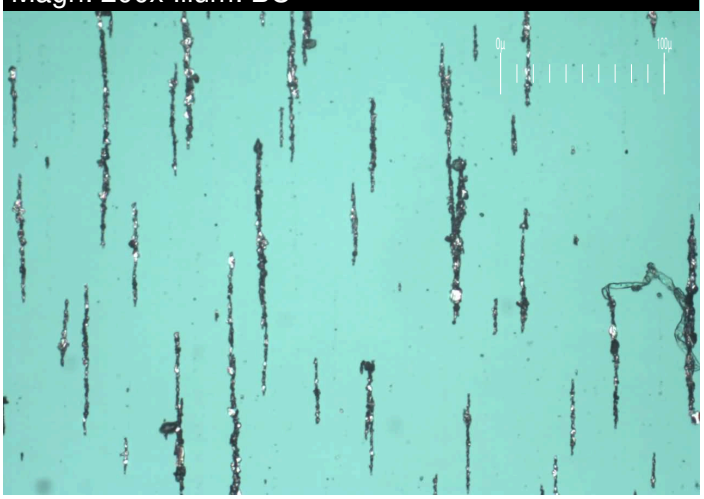
We recommend you service the filters on this component. We recommend an early resample to monitor this condition.

WEAR

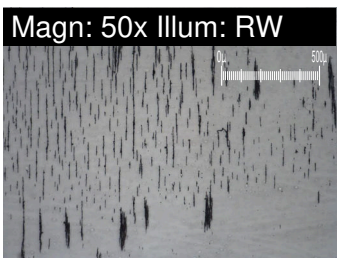
Copper ppm levels are abnormal. Bearing wear is indicated. The ferrography results are normal indicating no abnormal wear in the system.

Test	UOM	Method	Limit/Abn	Current	History1	History2
Sample Number		Client Info		WC0839695	WC0747564	WC0747565
Sample Date		Client Info		17 May 2024	02 Mar 2024	29 Feb 2024
Machine Age	hrs	Client Info		0	0	0
Oil Age	hrs	Client Info		0	0	0
Filter Age	hrs	Client Info		0	0	0
Oil Changed		Client Info		Not Changd	Not Changd	Not Changd
Filter Changed		Client Info		None	None	None
Sample Status				ABNORMAL	ABNORMAL	SEVERE
PQ		ASTM D8184*		0	0	0
Iron	ppm	ASTM D5185(m)	>20	5	<1	2
Chromium	ppm	ASTM D5185(m)	>2	0	0	0
Nickel	ppm	ASTM D5185(m)	>2	0	<1	<1
Titanium	ppm	ASTM D5185(m)		0	0	0
Silver	ppm	ASTM D5185(m)		0	<1	<1
Aluminum	ppm	ASTM D5185(m)	>5	0	<1	<1
Lead	ppm	ASTM D5185(m)	>25	0	<1	<1
Copper	ppm	ASTM D5185(m)	>5	▲ 8	▲ 7	▲ 7
Tin	ppm	ASTM D5185(m)	>15	10	4	● 10
Vanadium	ppm	ASTM D5185(m)		0	0	0
White Metal	scalar	Visual*	NONE	NONE	NONE	NONE
Yellow Metal	scalar	Visual*	NONE	NONE	NONE	NONE
Large Particles		DR-Ferr*		18.2	---	---
Small Particles		DR-Ferr*		8.4	---	---
Total Particles		DR-Ferr*	>---	26.6	---	---
Large Particles Percentage	%	DR-Ferr*		36.8	---	---
Severity Index		DR-Ferr*		178	---	---
Ferrous Rubbing	Scale 0-10	ASTM D7684*		3		
Ferrous Sliding	Scale 0-10	ASTM D7684*				
Ferrous Cutting	Scale 0-10	ASTM D7684*				
Ferrous Rolling	Scale 0-10	ASTM D7684*		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*				

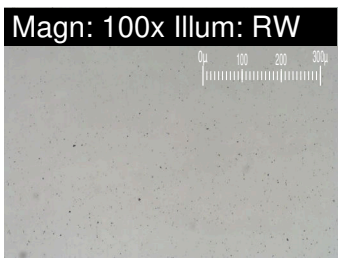
Magn: 200x Illum: BC



Magn: 50x Illum: RW



Magn: 100x Illum: RW



CONTAMINANTS

There is a moderate amount of silt (particulates < 14 microns in size) present in the oil.

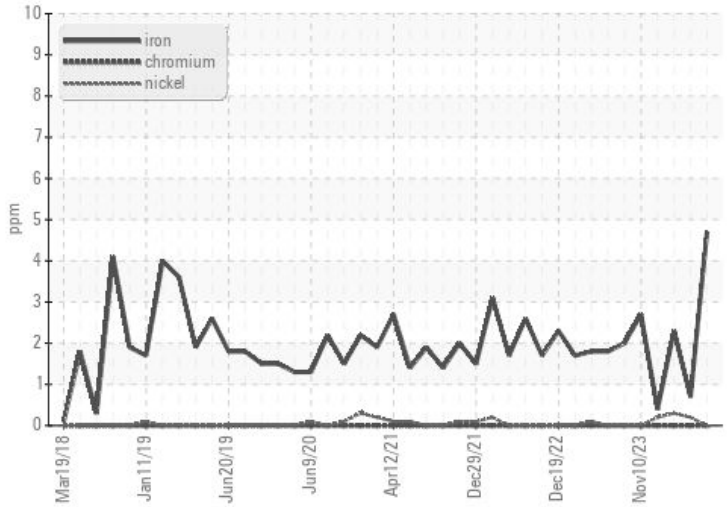
Silicon	ppm	ASTM D5185(m)	>15	**4**	4	4
Potassium	ppm	ASTM D5185(m)	>20	**<1**	<1	<1
Water		WC Method	>0.1	**NEG**	NEG	NEG
Particles >4µm		ASTM D7647	>10000	▲ **68605**	6935	▲ 85316
Particles >6µm		ASTM D7647	>2500	▲ **9288**	1294	▲ 13744
Particles >14µm		ASTM D7647	>160	● **199**	67	● 259
Particles >21µm		ASTM D7647	>40	**28**	17	35
Particles >38µm		ASTM D7647	>10	**1**	2	2
Particles >71µm		ASTM D7647	>3	**1**	1	1
Oil Cleanliness		ISO 4406 (c)	>20/18/14	▲ **23/20/15**	20/17/13	▲ 24/21/15
Silt	scalar	Visual*	NONE	**NONE**	NONE	NONE
Debris	scalar	Visual*	NONE	**VLITE**	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*	>0.1	**NEG**	NEG	NEG
Carbonaceous Material	Scale 0-10	ASTM D7684*				
Sand/Dirt	Scale 0-10	ASTM D7684*		**1**		
Fibres	Scale 0-10	ASTM D7684*				
Spheres	Scale 0-10	ASTM D7684*				
Other	Scale 0-10	ASTM D7684*		**1**		

OIL CONDITION

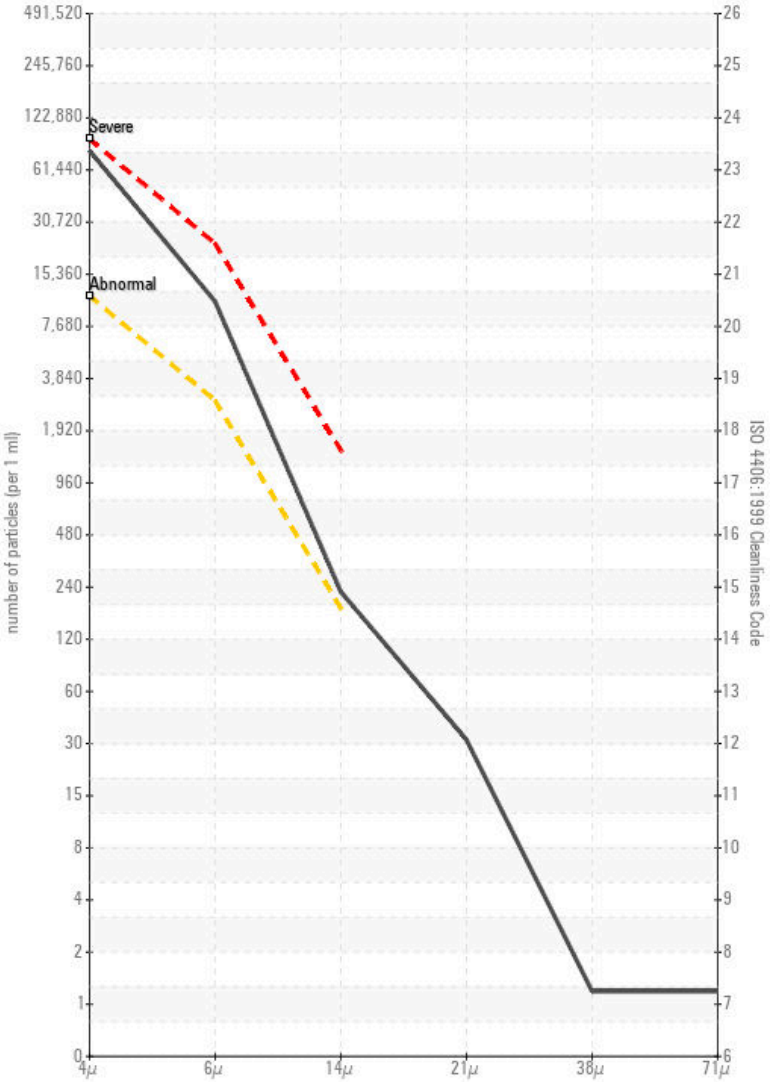
The AN level is acceptable for this fluid. The oil is no longer serviceable as a result of the abnormal and/or severe wear.

Sodium	ppm	ASTM D5185(m)		**<1**	<1	<1
Boron	ppm	ASTM D5185(m)		**<1**	0	0
Barium	ppm	ASTM D5185(m)		**0**	0	0
Molybdenum	ppm	ASTM D5185(m)		**0**	0	0
Manganese	ppm	ASTM D5185(m)		**0**	0	0
Magnesium	ppm	ASTM D5185(m)	110	**<1**	<1	<1
Calcium	ppm	ASTM D5185(m)	60	**54**	54	54
Phosphorus	ppm	ASTM D5185(m)	330	**334**	339	338
Zinc	ppm	ASTM D5185(m)	390	**430**	423	421
Sulfur	ppm	ASTM D5185(m)	660	**893**	777	776
Acid Number (AN)	mg KOH/g	ASTM D974*	0.28	**0.49**	0.43	0.37
Visc @ 40°C	cSt	ASTM D7279(m)	100	**100**	99.5	99.2
Lubricant Degradation	Scale 0-10	ASTM D7684*				

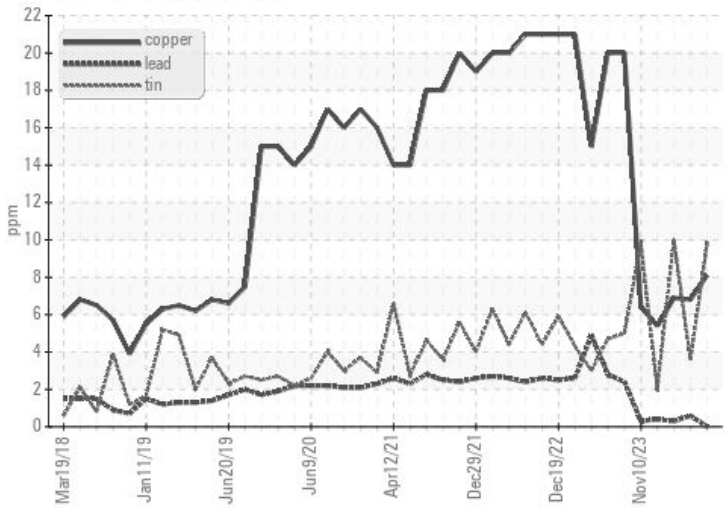
Ferrous Alloys



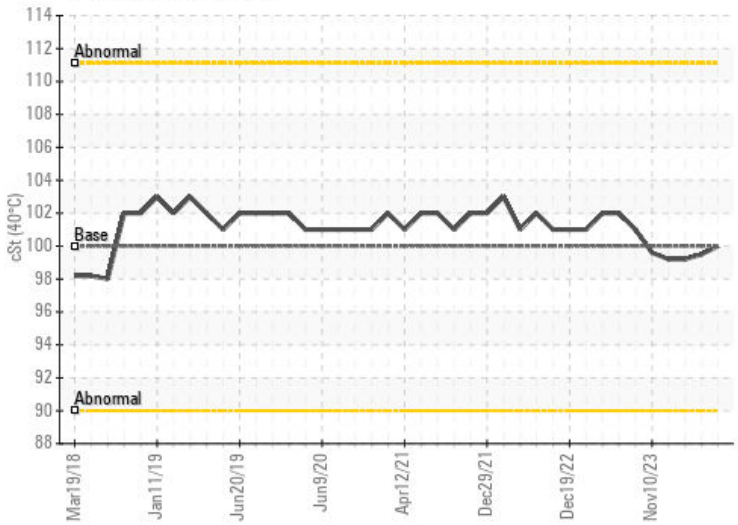
Particle Count



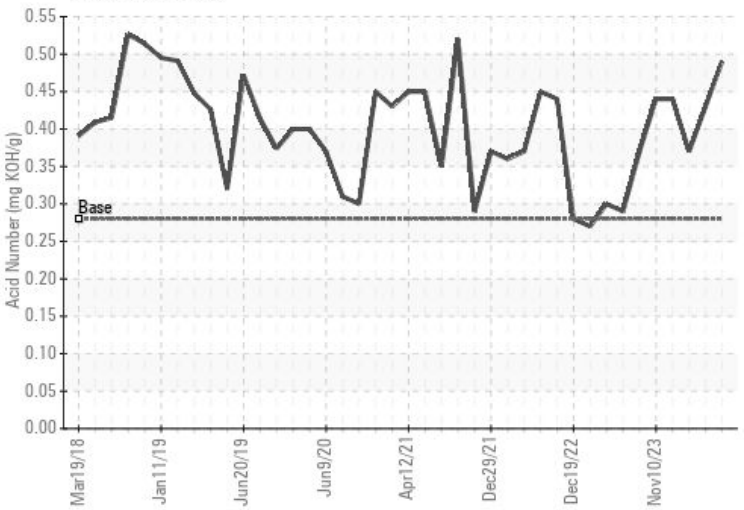
Non-ferrous Metals



Viscosity @ 40°C



Acid Number



ISO 17025:2017 Accredited Laboratory

Laboratory : WearCheck - C8-1175 Appleby Line, Burlington, ON L7L 5H9
Sample No. : WC0839695 **Received** : 30 May 2024
Lab Number : 02638961 **Tested** : 06 Jun 2024
Unique Number : 5788123 **Diagnosed** : 06 Jun 2024 - Kevin Marson
Test Package : MAR 3 (Additional Tests: PRTCOUNT, TAN Man)

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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