MAR III

WEAR CHECK

OIL ANALYSIS REPORT

WEAR	ABNORMAL
CONTAMINANTS	ABNORMAL
OIL CONDITION	NORMAL

Machine Id
PP437.010.10 HAWSER WINCH MOTOR STBD (S/N 3897099)
Component
Winch
Fluid
PETRO CANADA SUPER GEAR FLUID EP 220 (4 LTR)

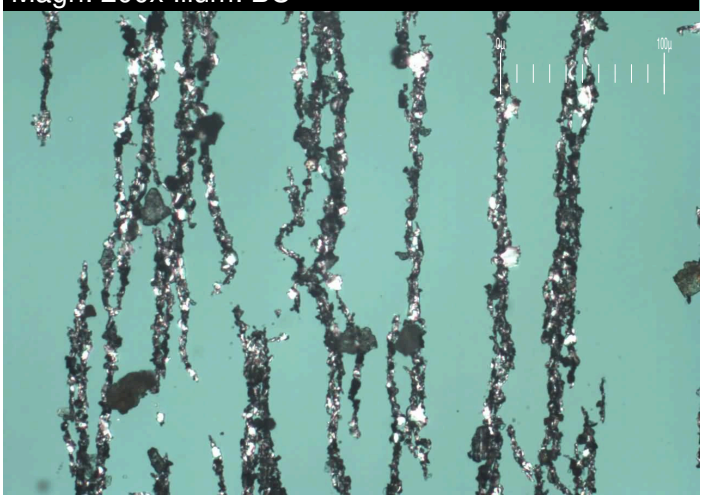
RECOMMENDATION

We advise that you check for the source of water entry. Check seals and/or filters for points of contaminant entry. The air breather requires service. If unrated, we recommend that you replace with a suitable micron rated and/or desiccant air breather. If rated, we recommend that you service/replace the breather. We recommend that you drain the oil from the component if this has not already been done. Confirm the source of the lubricant being utilized for top-up/fill. We recommend an early resample to monitor this condition.

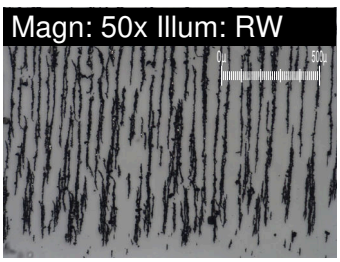
WEAR

Wear particle analysis indicates that the ferrous cutting particles are abnormal. Cutting wear particles are caused by either hard protuberances (mis-aligned components, etc.), or abrasives entering the system and embedding themselves in softer materials (sand, etc.), and gouging out mating surfaces.

Magn: 200x Illum: BC



Magn: 50x Illum: RW



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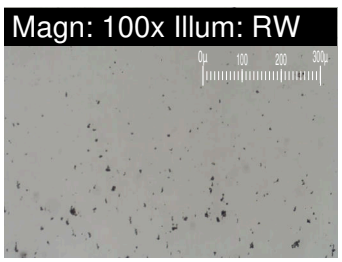


Test	UOM	Method	Limit/Abn	Current	History1	History2
Sample Number		Client Info		WC0895911	WC0608430	WC0523948
Sample Date		Client Info		25 Jun 2024	22 Jul 2022	12 Jul 2021
Machine Age	mths	Client Info		0	0	0
Oil Age	mths	Client Info		0	0	0
Filter Age	mths	Client Info		0	0	0
Oil Changed		Client Info		N/A	Changed	Not Changd
Filter Changed		Client Info		N/A	None	Not Changd
Sample Status				ABNORMAL	ABNORMAL	SEVERE
PQ		ASTM D8184*		0	0	24
Iron	ppm	ASTM D5185(m)	>30	48	30	66
Chromium	ppm	ASTM D5185(m)	>2	0	0	<1
Nickel	ppm	ASTM D5185(m)	>2	<1	0	<1
Titanium	ppm	ASTM D5185(m)	>2	0	0	0
Silver	ppm	ASTM D5185(m)	>2	0	0	0
Aluminum	ppm	ASTM D5185(m)	>5	<1	<1	2
Lead	ppm	ASTM D5185(m)	>70	0	<1	<1
Copper	ppm	ASTM D5185(m)	>65	5	10	12
Tin	ppm	ASTM D5185(m)	>9	0	0	<1
Vanadium	ppm	ASTM D5185(m)		0	0	0
White Metal	scalar	Visual*	NONE	VLITE	NONE	VLITE
Yellow Metal	scalar	Visual*	NONE	NONE	NONE	NONE
Large Particles		DR-Ferr*		89.8	---	---
Small Particles		DR-Ferr*		35.2	---	---
Total Particles		DR-Ferr*	>---	125	---	---
Large Particles Percentage	%	DR-Ferr*		43.7	---	---
Severity Index		DR-Ferr*		4903	---	---
Ferrous Rubbing	Scale 0-10	ASTM D7684*		4		
Ferrous Sliding	Scale 0-10	ASTM D7684*				
Ferrous Cutting	Scale 0-10	ASTM D7684*		1		
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*				

CONTAMINANTS

There is a moderate concentration of water present in the oil. Free water present.

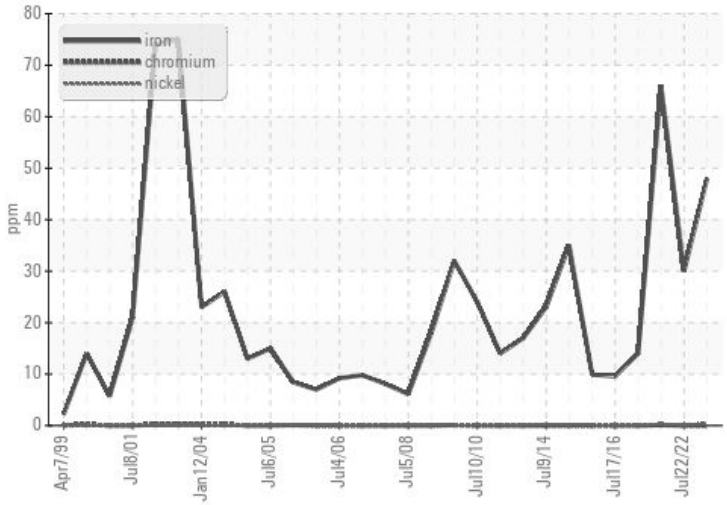
Silicon	ppm	ASTM D5185(m)	>30	**2**	2	6
Potassium	ppm	ASTM D5185(m)	>20	**<1**	<1	<1
Water	%	ASTM D6304*	>0.2	▲ **0.344**	▲ 0.936	▲ 1.197
ppm Water	ppm	ASTM D6304*	>2000	▲ **3448**	▲ 9364.1	▲ 11972.5
Silt	scalar	Visual*	NONE	**NONE**	LIGHT	VLITE
Debris	scalar	Visual*	NONE	**NONE**	NONE	VLITE
Sand/Dirt	scalar	Visual*	NONE	**VLITE**	NONE	NONE
Appearance	scalar	Visual*	NORML	▲ **MILKY**	NORML	NORML
Odor	scalar	Visual*	NORML	**NORML**	NORML	NORML
Emulsified Water	scalar	Visual*	>0.2	▲ **.2%**	▲ .5%	▲ .5%
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*		**2**		

OIL CONDITION

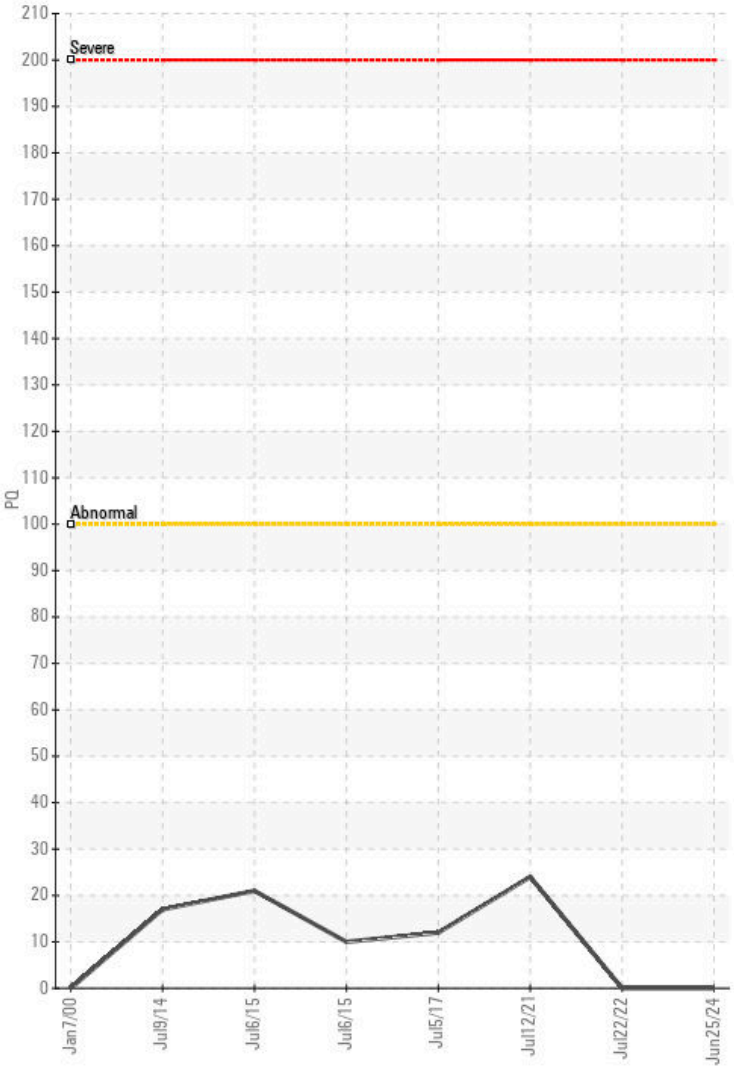
Additive levels indicate the addition of a different brand, or type of oil. The AN level is acceptable for this fluid. The oil is no longer serviceable as a result of the abnormal and/or severe wear.

Sodium	ppm	ASTM D5185(m)		**2**	<1	4
Boron	ppm	ASTM D5185(m)		**35**	2	21
Barium	ppm	ASTM D5185(m)		**<1**	0	<1
Molybdenum	ppm	ASTM D5185(m)		**0**	4	0
Manganese	ppm	ASTM D5185(m)		**<1**	<1	<1
Magnesium	ppm	ASTM D5185(m)		**5**	18	1
Calcium	ppm	ASTM D5185(m)		**11**	23	8
Phosphorus	ppm	ASTM D5185(m)	400	**286**	308	443
Zinc	ppm	ASTM D5185(m)		**27**	96	35
Sulfur	ppm	ASTM D5185(m)	340	**9769**	4572	5152
Acid Number (AN)	mg KOH/g	ASTM D974*	0.38	**0.43**	0.44	0.56
Visc @ 40°C	cSt	ASTM D7279(m)	219.3	**197**	188	200
Lubricant Degradation	Scale 0-10	ASTM D7684*				

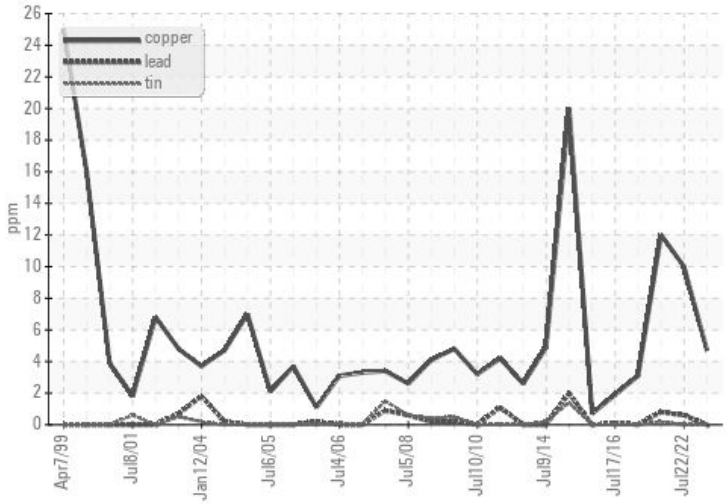
Ferrous Alloys



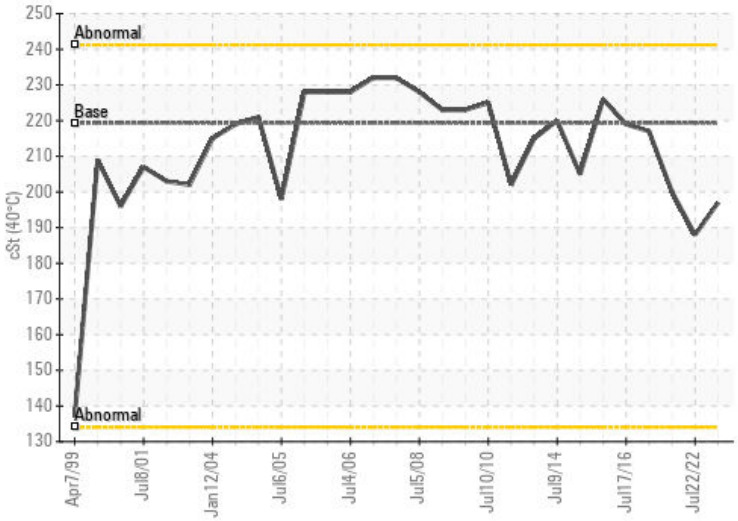
PQ



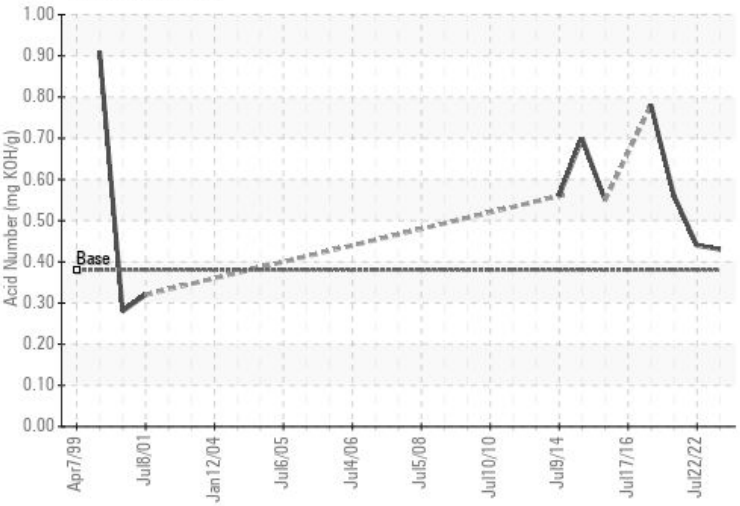
Non-ferrous Metals



Viscosity @ 40°C



Acid Number



ISO 17025:2017 Accredited Laboratory

Laboratory	: WearCheck - C8-1175 Appleby Line, Burlington, ON L7L 5H9		
Sample No.	: WC0895911	**Received**	: 03 Jul 2024
Lab Number	: 02645309	**Tested**	: 08 Jul 2024
Unique Number	: 5802848	**Diagnosed**	: 08 Jul 2024 - Kevin Marson
Test Package	: MAR 3 (Additional Tests: KF, 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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