MAR III

WEAR CHECK

OIL ANALYSIS REPORT

WEAR	MARGINAL
CONTAMINANTS	NORMAL
OIL CONDITION	NORMAL

Machine Id
CATERPILLAR DG#2 (S/N DPC00210)
Component
Starboard Main Engine
Fluid
PETRO CANADA DURON HP 15W40 (625 LTR)

RECOMMENDATION

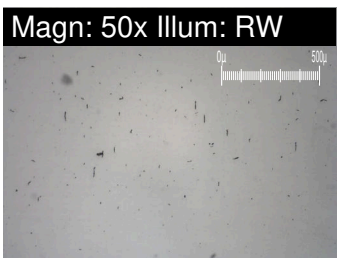
We recommend an early resample to monitor this condition. No other corrective action is recommended at this time.

WEAR

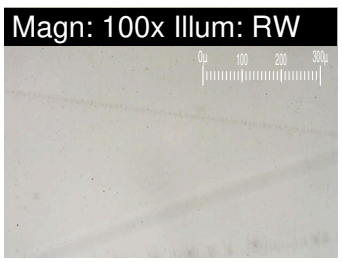
Wear particle analysis indicates that the ferrous cutting particles are marginal. All other component wear rates are normal. Cutting wear particles are caused by either hard protuberances (mis-aligned components, etc.), or abrasives entering the system and embedding themselves in softer materials (sand,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

Magn: 200x Illum: BC

Magn: 50x Illum: RW



Magn: 100x Illum: RW



Test	UOM	Method	Limit/Abn	Current	History1	History2
Sample Number		Client Info		WC0883752	WC0757631	WC0761448
Sample Date		Client Info		17 Dec 2023	02 Oct 2023	12 May 2023
Machine Age	hrs	Client Info		10931	9931	8089
Oil Age	hrs	Client Info		0	0	0
Filter Age	hrs	Client Info		0	0	0
Oil Changed		Client Info		N/A	Changed	N/A
Filter Changed		Client Info		N/A	Changed	N/A
Sample Status				MARGINAL	MARGINAL	NORMAL
PQ		ASTM D8184*		0	0	0
Iron	ppm	ASTM D5185(m)	>75	5	10	4
Chromium	ppm	ASTM D5185(m)	>8	0	<1	0
Nickel	ppm	ASTM D5185(m)	>2	<1	<1	<1
Titanium	ppm	ASTM D5185(m)	>3	0	0	<1
Silver	ppm	ASTM D5185(m)	>2	0	<1	0
Aluminum	ppm	ASTM D5185(m)	>15	1	<1	1
Lead	ppm	ASTM D5185(m)	>18	2	3	1
Copper	ppm	ASTM D5185(m)	>80	2	10	5
Tin	ppm	ASTM D5185(m)	>14	0	0	<1
Vanadium	ppm	ASTM D5185(m)		0	0	0
Large Particles		DR-Ferr*		3.1	7.5	2.3
Small Particles		DR-Ferr*		2.1	6.4	1.1
Total Particles		DR-Ferr*	>---	5.2	13.9	3.4
Large Particles Percentage	%	DR-Ferr*		19.2	7.9	35.3
Severity Index		DR-Ferr*		3	8	3
Ferrous Rubbing	Scale 0-10	ASTM D7684*		2	2	1
Ferrous Sliding	Scale 0-10	ASTM D7684*				
Ferrous Cutting	Scale 0-10	ASTM D7684*		1		
Ferrous Rolling	Scale 0-10	ASTM D7684*		1	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*				
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

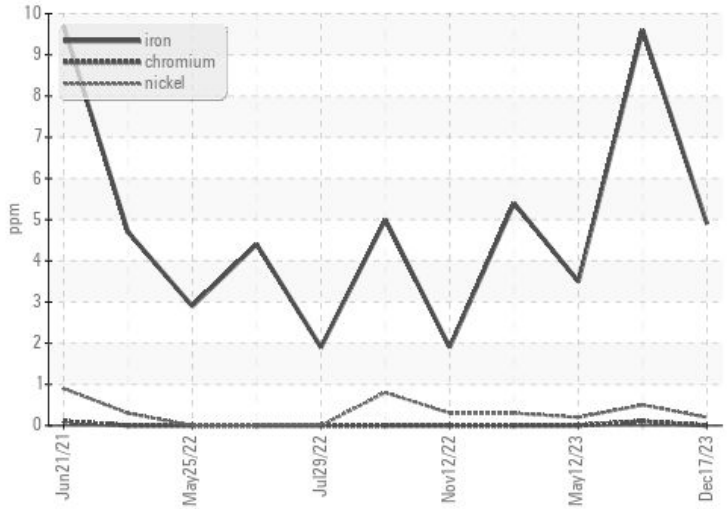
Light fuel dilution occurring. No other contaminants were detected in the oil.

OIL CONDITION

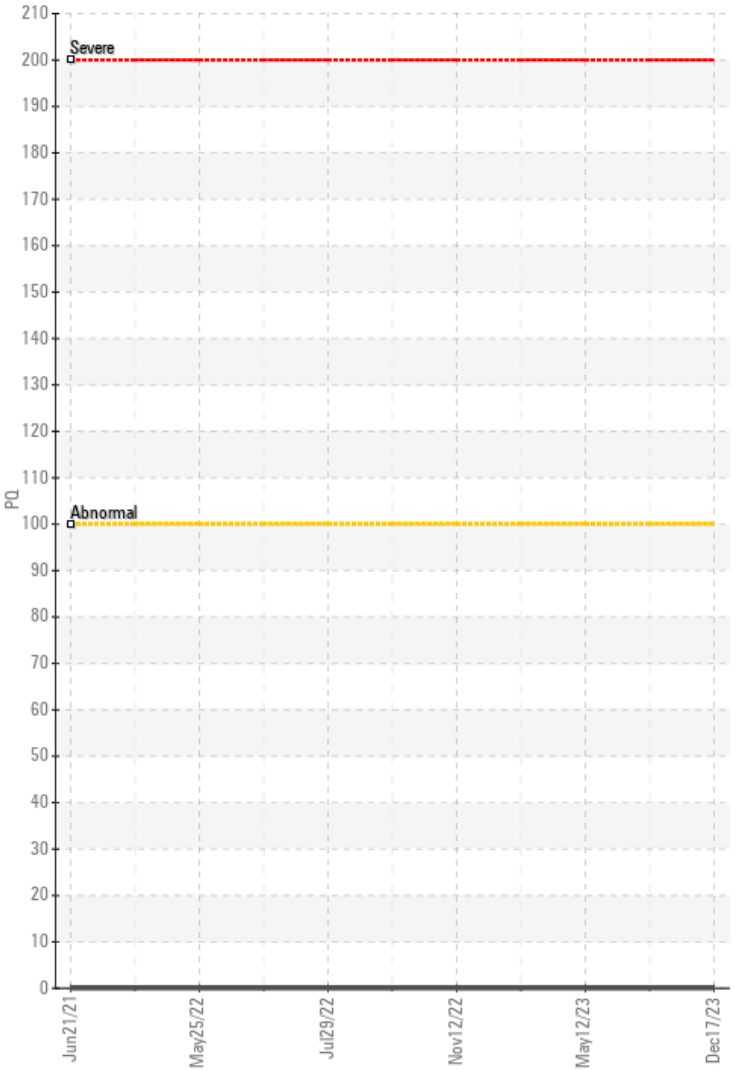
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

Silicon	ppm	ASTM D5185(m)	>20	**2**	2	2
Potassium	ppm	ASTM D5185(m)	>20	**4**	22	0
Fuel	%	ASTM D7593*	>4.0	**1.5**	▲ 2	<1.0
Water		WC Method	>0.1	**NEG**	NEG	NEG
Glycol		WC Method		**NEG**	0.0	NEG
Soot %	%	ASTM D7844*		**0**	0	0
Nitration	Abs/cm	ASTM D7624*	>20	**7.1**	7.3	6.8
Sulfation	Abs/.1mm	ASTM D7415*	>30	**20.1**	20.0	19.9
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**	1	1
Sodium	ppm	ASTM D5185(m)	>75	**1**	4	2
Boron	ppm	ASTM D5185(m)	0	**2**	3	3
Barium	ppm	ASTM D5185(m)	0	**0**	<1	0
Molybdenum	ppm	ASTM D5185(m)	60	**58**	63	60
Manganese	ppm	ASTM D5185(m)	0	**0**	0	<1
Magnesium	ppm	ASTM D5185(m)	1010	**975**	1011	977
Calcium	ppm	ASTM D5185(m)	1070	**1076**	1087	1105
Phosphorus	ppm	ASTM D5185(m)	1150	**1040**	1056	1064
Zinc	ppm	ASTM D5185(m)	1270	**1203**	1245	1176
Sulfur	ppm	ASTM D5185(m)	2060	**2718**	2606	2627
Oxidation	Abs/.1mm	ASTM D7414*	>25	**16.0**	15.7	15.3
Base Number (BN)	mg KOH/g	ASTM D2896*	9.8	**9.68**	9.14	8.88
Visc @ 100°C	cSt	ASTM D7279(m)	15.6	**13.0**	12.7	13.0
Lubricant Degradation	Scale 0-10	ASTM D7684*				

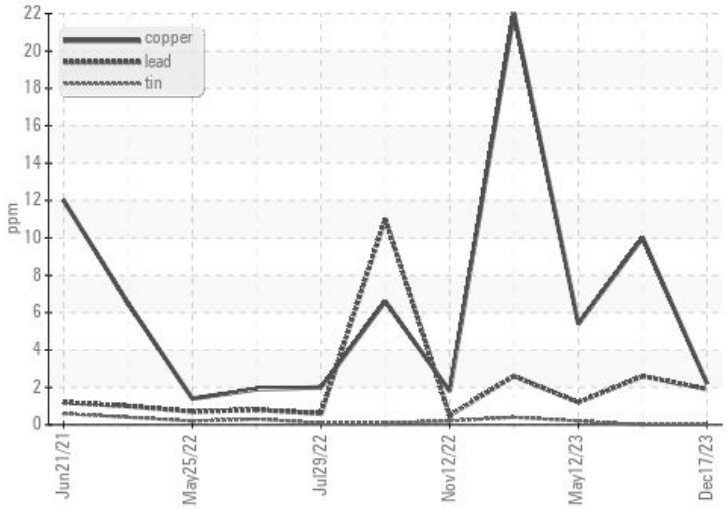
Ferrous Alloys



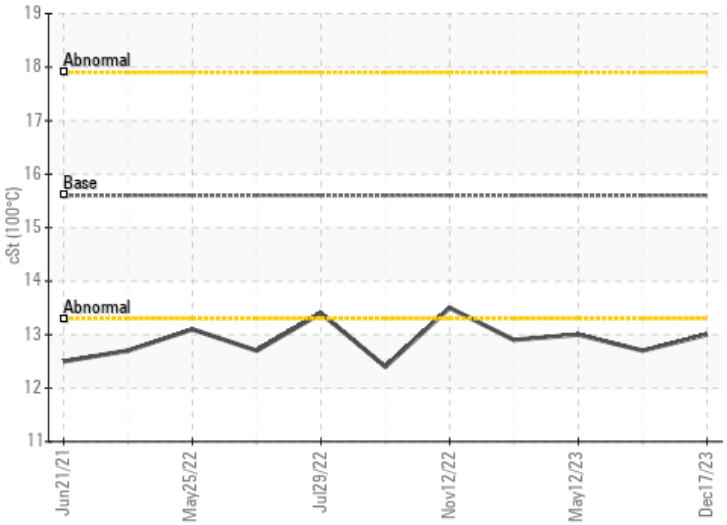
PQ



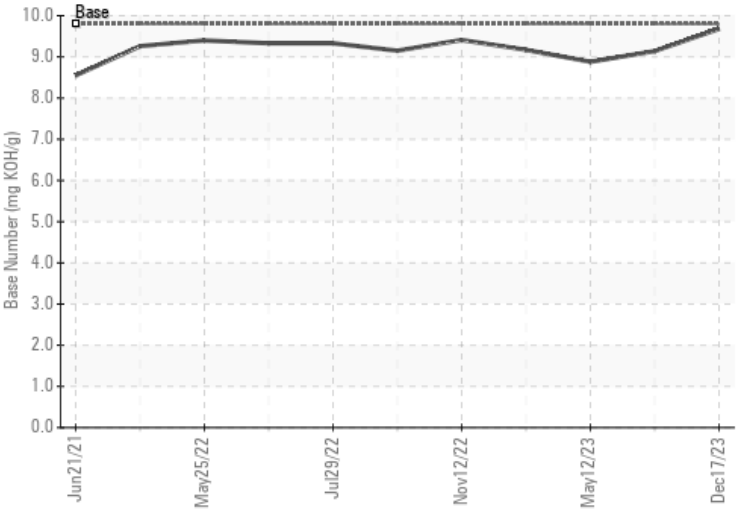
Non-ferrous Metals



Viscosity @ 100°C



Base Number



ISO 17025:2017 Accredited Laboratory

Laboratory : WearCheck - C8-1175 Appleby Line, Burlington, ON L7L 5H9 **Canadian Coast Guard - John Cabot**
Sample No. : WC0883752 **Recieved** : 11 Jan 2024
Lab Number : 02608086 **Diagnosed** : 16 Jan 2024
Unique Number : 5709172 **Diagnostician** : Kevin Marson
Test Package : MAR 3 (Additional Tests: FuelDilution, PercentFuel)

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.

280 Southside Road
St. John`s, NL
CA A1E 0A3
Contact: Chief Engineer
johncabotce@ccgs-ngcc.gc.ca
T: (709)730-4628
F:

This page left intentionally blank