



OIL ANALYSIS REPORT

WEAR	NORMAL
CONTAMINATION	NORMAL
FLUID CONDITION	NORMAL

Area

Locomotives

Machine Id

2009

Component

Railway diesel

Fluid

RAILWAY ENGINE OIL SAE 40 (--- GAL)

RECOMMENDATION

Resample at the next service interval to monitor. Please specify the component make and model with your next sample. Please contact your representative for information regarding the proper sampling kits for your service. NOTE: We recommend using MOB 2 test kits, this testkit includes BN to determine the suitability of the oil for continued use.

Test	UOM	Method	Limit/Abn	Current	History1	History2
Sample Number		Client Info		WC0793403	WC0281872	---
Sample Date		Client Info		12 Jul 2023	20 Apr 2017	---
Machine Age	hrs	Client Info		0	0	---
Oil Age	hrs	Client Info		0	0	---
Filter Age	hrs	Client Info		0	0	---
Oil Changed		Client Info		Not Chngd	N/A	---
Filter Changed		Client Info		Not Chngd	N/A	---
Sample Status				NORMAL	NORMAL	---

WEAR

All component wear rates are normal.

Iron	ppm	ASTM D5185(m)	>42	13	11	---
Chromium	ppm	ASTM D5185(m)	>6	<1	1	---
Nickel	ppm	ASTM D5185(m)	>2	<1	0	---
Titanium	ppm	ASTM D5185(m)		0	0	---
Silver	ppm	ASTM D5185(m)	>5	0	0	---
Aluminum	ppm	ASTM D5185(m)	>4	3	1	---
Lead	ppm	ASTM D5185(m)	>30	<1	6	---
Copper	ppm	ASTM D5185(m)	>95	3	7	---
Tin	ppm	ASTM D5185(m)	>10	<1	3	---
Vanadium	ppm	ASTM D5185(m)		0	0	---

CONTAMINATION

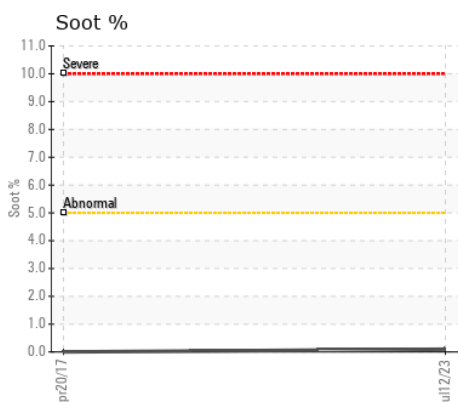
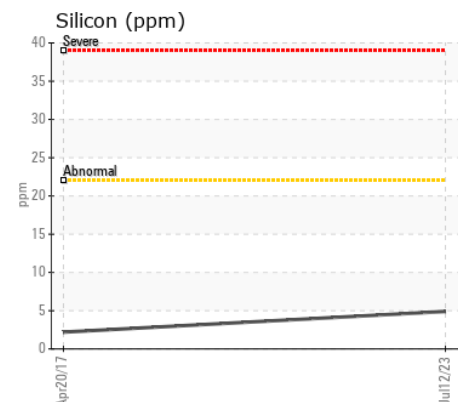
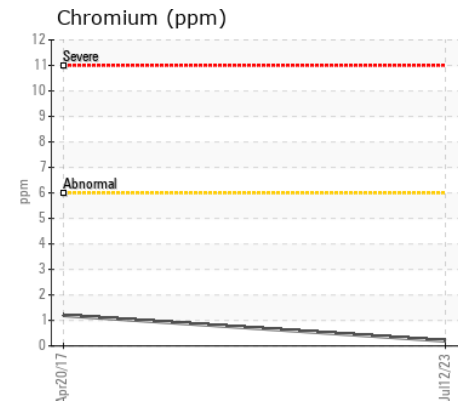
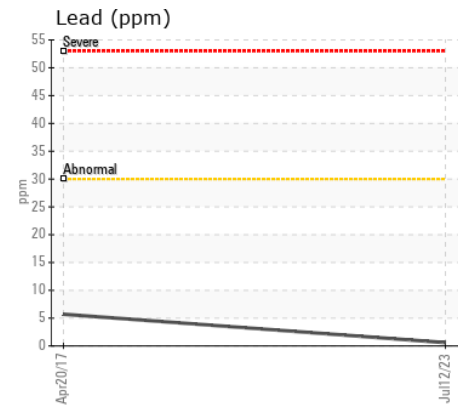
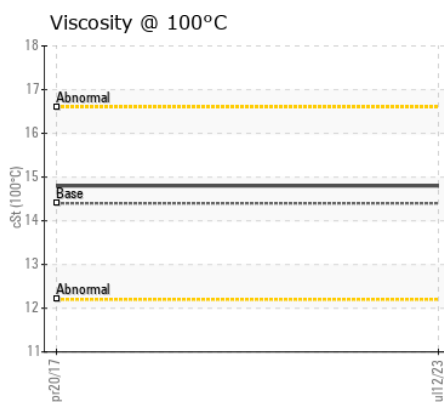
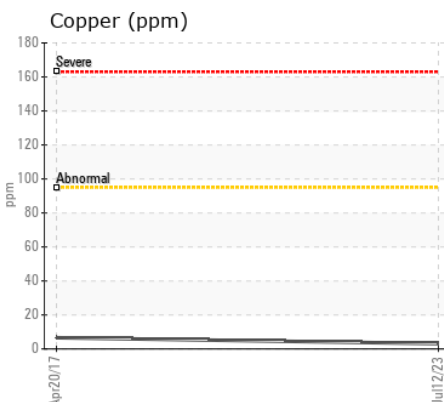
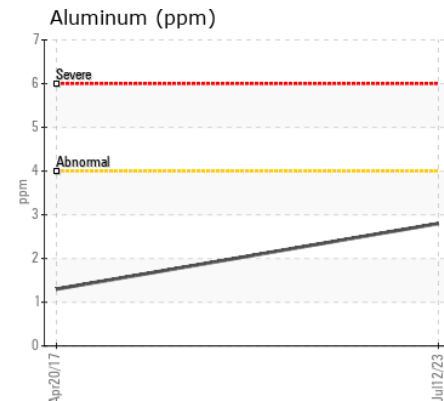
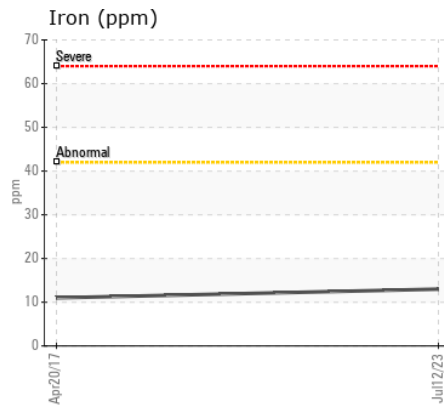
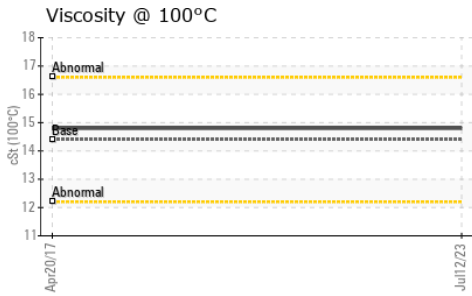
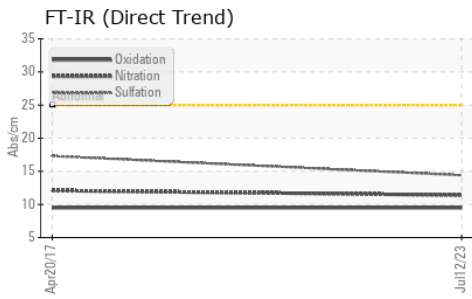
There is no indication of any contamination in the oil.

Silicon	ppm	ASTM D5185(m)	>22	5	2	---
Potassium	ppm	ASTM D5185(m)	>20	1	2	---
Fuel		WC Method	>4.0	<1.0	<1.0	---
Water		WC Method	>0.1	NEG	NEG	---
Glycol		WC Method		NEG	NEG	---
Soot %	%	ASTM D7844*		0.1	0	---
Nitration	Abs/cm	ASTM D7624*	>20	11.4	12.1	---
Sulfation	Abs/.1mm	ASTM D7415*	>30	14.4	17.3	---
Emulsified Water	scalar	Visual*	>0.1	NEG	NEG	---

FLUID CONDITION

The condition of the oil is acceptable for the time in service (unconfirmed).

Sodium	ppm	ASTM D5185(m)		3	5	---
Boron	ppm	ASTM D5185(m)	10	<1	<1	---
Barium	ppm	ASTM D5185(m)	10	0	<1	---
Molybdenum	ppm	ASTM D5185(m)	25	0	<1	---
Manganese	ppm	ASTM D5185(m)		<1	<1	---
Magnesium	ppm	ASTM D5185(m)	20	17	24	---
Calcium	ppm	ASTM D5185(m)	4500	4632	4605	---
Phosphorus	ppm	ASTM D5185(m)	10	2	6	---
Zinc	ppm	ASTM D5185(m)	10	4	7	---
Sulfur	ppm	ASTM D5185(m)	5000	3111	3946	---
Oxidation	Abs/.1mm	ASTM D7414*	>25	9.5	9.5	---
Visc @ 100°C	cSt	ASTM D7279(m)	14.4	14.8	14.8	---



Laboratory : WearCheck - C8-1175 Appleby Line, Burlington, ON L7L 5H9
Sample No. : WC0793403
Lab Number : 02571839
Unique Number : 5616890
Test Package : MOB 1
Received : 25 Jul 2023
Tested : 25 Jul 2023
Diagnosed : 25 Jul 2023 - Wes Davis

Vale - Transportation (Mobile Equipment)
 Transportation Department, (Services - Mobile Equipment)
 COPPER CLIFF, ON
 CA P0M 1N0
 Contact: Richard Rochon
 richard.rochon@vale.com
 T: (705)682-6014
 F:

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.