

OIL ANALYSIS REPORT



WEAR



KEMP QUARRIES / PRYOR STONE [67471] OHT093 Component

Diesel Engine

PETRO CANADA DURON HP 15W40 (--- GAL)

SAMPLE INFOR	MATION	method	limit/base	current	history1	history2
Sample Number		Client Info		PCA0084391	PCA0084041	PCA001981
Sample Date		Client Info		05 Dec 2023	25 Jul 2023	03 Nov 2020
Machine Age	hrs	Client Info		16093	15337	15191
Oil Age	hrs	Client Info		756	0	604
Oil Changed	1110	Client Info		Changed	Changed	Changed
Sample Status				ABNORMAL	NORMAL	NORMAL
CONTAMINAT		method	limit/base	current	history1	history2
Fuel		WC Method	>5	<1.0	<1.0	<1.0
Water		WC Method	>0.2	NEG	NEG	NEG
WEAR METAL	S	method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185m	>100	62	16	39
Chromium	ppm	ASTM D5185m		1	<1	1
Nickel	ppm	ASTM D5185m	>2	2	<1	<1
Titanium	ppm	ASTM D5185m		0	<1	<1
Silver	ppm	ASTM D5185m	>2	0	0	<1
Aluminum	ppm	ASTM D5185m		2	2	0
Lead		ASTM D5185m	>40	3	2	7
	ppm	ASTM D5185m		658	6	5
Copper Tin	ppm	ASTM D5185m	>330	3	1	<1
	ppm		>15			< 1
Antimony	ppm	ASTM D5185m		0		0
Vanadium	ppm	ASTM D5185m		0	0	
Cadmium	ppm	ASTM D5185m		U	0	0
ADDITIVES		method	limit/base	current	history1	history2
	ppm	ASTM D5185m		3	0	6
Barium	ppm ppm	ASTM D5185m ASTM D5185m		3 <1	<1	0
Barium					<1 57	0 54
Barium Molybdenum	ppm	ASTM D5185m		<1	<1	0 54 <1
Barium Molybdenum Manganese Magnesium	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m		<1 68	<1 57	0 54
Boron Barium Molybdenum Manganese Magnesium Calcium	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m		<1 68 <1	<1 57 <1	0 54 <1
Barium Molybdenum Manganese Magnesium	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m		<1 68 <1 1001	<1 57 <1 896	0 54 <1 790
Barium Molybdenum Manganese Magnesium Calcium	ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m		<1 68 <1 1001 1111	<1 57 <1 896 1030	0 54 <1 790 1444
Barium Molybdenum Manganese Magnesium Calcium Phosphorus	ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m		<1 68 <1 1001 1111 1117	<1 57 <1 896 1030 980	0 54 <1 790 1444 1023
Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc	ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base	<1 68 <1 1001 1111 1117 1334	<1 57 <1 896 1030 980 1156	0 54 <1 790 1444 1023 1225
Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur	ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base >25	<1 68 <1 1001 1111 1117 1334 2852	<1 57 <1 896 1030 980 1156 3155	0 54 <1 790 1444 1023 1225 2551
Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN	ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m method		<1 68 <1 1001 1111 1117 1334 2852 current	<1 57 <1 896 1030 980 1156 3155 history1	0 54 <1 790 1444 1023 1225 2551 history2
Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon	ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m method ASTM D5185m		<1 68 <1 1001 1111 1117 1334 2852 current 15	<1 57 <1 896 1030 980 1156 3155 history1 19	0 54 <1 790 1444 1023 1225 2551 history2 6
Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium	ppm ppm ppm ppm ppm ppm ppm ppm yts	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m method ASTM D5185m ASTM D5185m	>25	<1 68 <1 1001 1111 1117 1334 2852 current 15 3	<1 57 <1 896 1030 980 1156 3155 history1 19 4	0 54 <1 790 1444 1023 1225 2551 history2 6 7
Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium	ppm ppm ppm ppm ppm ppm ppm ppm yts	ASTM D5185m ASTM D5185m	>25	<1 68 <1 1001 1111 1117 1334 2852 current 15 3 2	<1 57 <1 896 1030 980 1156 3155 history1 19 4 2	0 54 <1 790 1444 1023 1225 2551 history2 6 7 5
Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Glycol	ppm ppm ppm ppm ppm ppm ppm ppm yts	ASTM D5185m ASTM D5185m	>25 >20	<1 68 <1 1001 1111 1117 1334 2852 current 15 3 2 NEG	<1 57 <1 896 1030 980 1156 3155 history1 19 4 2 NEG	0 54 <1 790 1444 1023 1225 2551 history2 6 7 5 NEG
Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Glycol INFRA-RED	ppm ppm ppm ppm ppm ppm ppm ppm yTTS ppm ppm ppm %	ASTM D5185m ASTM D5185m *ASTM D2982 method *ASTM D7844	>25 >20 limit/base >3	<1 68 <1 1001 1111 1117 1334 2852 current 15 3 2 NEG current 0.5	<1 57 <1 896 1030 980 1156 3155 history1 19 4 2 NEG history1 0.1	0 54 <1 790 1444 1023 1225 2551 history2 6 7 5 NEG history2 0.8
Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Glycol INFRA-RED Soot % Nitration	ppm ppm ppm ppm ppm ppm ppm ppm yTTS	ASTM D5185m ASTM D5185m *ASTM D2982	>25 >20 limit/base >3	<1 68 <1 1001 1111 1117 1334 2852 current 15 3 2 NEG current	<1 57 <1 896 1030 980 1156 3155 history1 19 4 2 NEG history1	0 54 <1 790 1444 1023 1225 2551 history2 6 7 5 NEG history2
Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Glycol INFRA-RED Soot % Nitration	<pre>ppm ppm ppm ppm ppm ppm ppm ppm ppm yTTS ppm ppm ppm %</pre>	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m *ASTM D2982 method *ASTM D7844 *ASTM D7824	>25 >20 limit/base >3 >20	<1 68 <1 1001 1111 1117 1334 2852 current 15 3 2 NEG current 0.5 10.3	<1 57 <1 896 1030 980 1156 3155 history1 19 4 2 NEG history1 0.1 4.8	0 54 <1 790 1444 1023 1225 2551 history2 6 7 5 NEG history2 0.8 10.7 23.8
Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Glycol INFRA-RED Soot % Nitration Sulfation	<pre>ppm ppm ppm ppm ppm ppm ppm ppm ppm yTTS ppm ppm ppm %</pre>	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m *ASTM D2982 method *ASTM D7844 *ASTM D7824	>25 >20 limit/base >3 >20 >30	<1 68 <1 1001 1111 1117 1334 2852 current 15 3 2 NEG current 0.5 10.3 21.8	<1 57 <1 896 1030 980 1156 3155 history1 19 4 2 NEG history1 0.1 4.8 17.1	0 54 <1 790 1444 1023 1225 2551 history2 6 7 5 NEG history2 0.8 10.7

DIAGNOSIS

Recommendation

Oil and filter change at the time of sampling has been noted. No corrective action is recommended at this time. Resample at the next service interval to monitor. (Customer Sample Comment: Pm4 performed. All oil samples taken. All oils, and all filters changed.)

🔺 Wear

The copper level is abnormal. Elemental level of copper (Cu) probably due to leaching of copper from copper components (i.e. cooling core) by the oil additives. All other component wear rates are normal.

Contamination

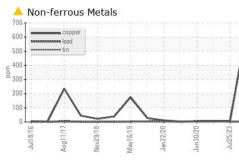
There is no indication of any contamination in the oil.

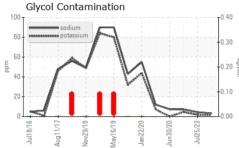
Fluid Condition

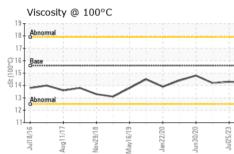
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is acceptable for the time in service.

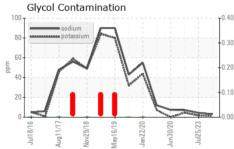


OIL ANALYSIS REPORT









	VISUAL		method	limit/base	current	history1	history2
	White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
	Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
	Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
1	Silt	scalar	*Visual	NONE	NONE	NONE	NONE
1	Debris	scalar	*Visual	NONE	NONE	NONE	NONE
	Sand/Dirt	scalar	*Visual	NONE	NONE	NONE	NONE
Jun30/20 - Jul25/23 -	Appearance	scalar	*Visual	NORML	NORML	NORML	NORML
Jun30,20 Jul25,23	Odor	scalar	*Visual	NORML	NORML	NORML	NORML
	Emulsified Water	scalar	*Visual	>0.2	NEG	NEG	NEG
T ^{0.40}	Free Water	scalar	*Visual		NEG	NEG	NEG
-0.30	FLUID PROP	ERTIES	method	limit/base	current	history1	history2
-0.20	Visc @ 100°C	cSt	ASTM D445	15.6	14.2	14.3	14.2
+0.10	GRAPHS						
	Iron (ppm)				Lead (ppm)		
10.00	200 - Severe		1		0 - Severe		
Jul25/23	150			60	0		
	100 Abnormal			E 4	D - Abnormal		
	50-	~		2	0-		
	Jul18/16 Aug11/17 Nov29/18	May16/19 Jan22/20	Jun30/20	Jul25/23	Jul18/16	May16/19	Jun30/20 Jun30/20
	Auç	Jar Mar	Jur	ηΓ			ար Սու
\sim	Aluminum (ppm))			Chromium (opm)	
	40 Severe			4(Severe		
/20	E 30 Abnormal			E 3	Abnormal		
Jun30/20 Jul25/23	10			1			
	0				0		
	Jul18/16 Aug11/17 Nov29/18	May16/19 Jan22/20	Jun30/20	Jul25/23	Jul18/16 Aug11/17	May16/19	Jun30/20 Jun30/20
	Jult	Mavi	Juni	Jul	Aug	May	յուրը Հորի
-0.30	Copper (ppm)			80	Silicon (ppm)	
-0.20							
	600 -			60			
-0.10	톱 400 - 유해야하 에			<u></u> 44	Abnormal		
0.00	200	~		21			\sim
Jul25/23		\sim					\sim
٦٢	Jul18/16 Aug11/17 Nov29/18	May16/19 Jan22/20	Jun30/20	Jul25/23	Jul18/16 -	May16/19	Jun30/20 Jun22/20
	Aug	May	Jun	ղոր	Aug	May	ար որի
	Viscosity @ 100°	C		10.1	Base Numbe	r	
	Abnormal			10.0 () () () () () () () () () () () () ()			/
				(8)/HOX Bul) tag Muny Bul) tag Muny Seg Seg			
	0.0016 Base	\sim		2 6.1 2 4.1			
	Abnormal			N 2.1			
	10			0.1			
	(D D 00	May16/19 -	Jun30/20 -	Jul25/23	Jul18/16	May16/19	Jun30/20 -
	Jul18/16 Aug11/17 Nov29/18	May16/19 Jan22/20	Jun3	Jul2	Jul1 Aug1	Nov29/18 May16/19	Jun3 Jun3
Laboratory Sample No. Lab Number Unique Numb Test Packag	er : 10793720	Recieved Diagnose Diagnost	l : 18 ed : 20 ician : Dor	ry, NC 2751 Dec 2023 Dec 2023 n Baldridge	3 Kemp	Quarries - Pry	yor Stone - Pryor 1050 E 520 Rd Pryor, OK US 74361 Contact:
	t, contact Customer Ser			Э.		pryor	@pryorstone.com
methods tha	t are outside of the ISO	17025 sco	be of accred	litation.			T:
oformity to on	ecifications are based on	the cimple	accontanco (dogigion rula	UCCM 106-201	2)	E٠

To discuss this sample repo * - Denotes test methods that are outside of the ISO 17025 scope of accreditation.

Statements of conformity to specifications are based on the simple acceptance decision rule (JCGM 106:2012)

Certificate L2367

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