

## **OIL ANALYSIS REPORT**

#### Area KEMP QUARRIES / KEMP STONE - FAIRLAND [69972] Machine Id WP023 Component

Diesel Engine

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

### DIAGNOSIS

#### Recommendation

Resample at the next service interval to monitor. ( Customer Sample Comment: Changed fluid and filters  $\ensuremath{\mathsf{)}}$ 

#### Wear

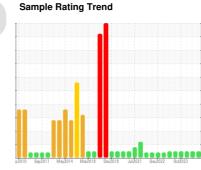
All component wear rates are normal.

#### 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 suitable for further service.



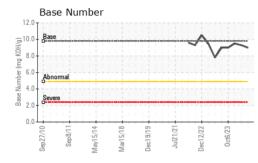


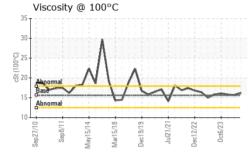
NORMAL

SAMPLE INFORI	MATION	method	limit/base	current	history1	history2
Sample Number		Client Info		PCA0109315	PCA0086492	PCA0070632
Sample Date		Client Info		20 Mar 2024	07 Feb 2024	02 Jan 2024
Machine Age	hrs	Client Info		2029	1722	1362
Oil Age	hrs	Client Info		6384	1723	1362
Oil Changed		Client Info		Changed	Changed	Changed
Sample Status				NORMAL	NORMAL	NORMAL
CONTAMINAT	ION	method	limit/base	current	history1	history2
Fuel		WC Method	>2.1	<1.0	<1.0	<1.0
Water		WC Method	>0.21	NEG	NEG	NEG
Glycol		WC Method		NEG	NEG	NEG
WEAR METAL	\$	method	limit/base	current	history1	history2
Iron	ppm		>51	24	18	26
Chromium	ppm	ASTM D5185m		<1	<1	<1
Nickel	ppm	ASTM D5185m	>5	<1	<1	0
Titanium	ppm	ASTM D5185m		<1	0	0
Silver	ppm	ASTM D5185m		0	0	0
Aluminum	ppm	ASTM D5185m		3	2	2
Lead	ppm	ASTM D5185m		3	<1	0
Copper	ppm	ASTM D5185m		2	0	<1
Tin	ppm	ASTM D5185m	>4	1	<1	0
Vanadium	ppm	ASTM D5185m		<1	<1	0
Cadmium	ppm	ASTM D5185m		<1	0	0
ADDITIVES		method	limit/base	current	history1	history2
ADDITIVES Boron	ppm	method ASTM D5185m	limit/base	current 0	history1 3	history2 0
	ppm ppm		limit/base			
Boron		ASTM D5185m	limit/base	0	3	0
Boron Barium	ppm	ASTM D5185m ASTM D5185m	limit/base	0 1	3 0	0 0
Boron Barium Molybdenum	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	limit/base	0 1 73	3 0 68	0 0 70
Boron Barium Molybdenum Manganese	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base	0 1 73 <1	3 0 68 <1	0 0 70 0
Boron Barium Molybdenum Manganese Magnesium	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base	0 1 73 <1 1089	3 0 68 <1 1108	0 0 70 0 1117
Boron Barium Molybdenum Manganese Magnesium Calcium	ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base	0 1 73 <1 1089 1298	3 0 68 <1 1108 1169	0 0 70 0 1117 1194
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus	ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base	0 1 73 <1 1089 1298 1147	3 0 68 <1 1108 1169 1176	0 0 70 0 1117 1194 1109
Boron 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	0 1 73 <1 1089 1298 1147 1422	3 0 68 <1 1108 1169 1176 1457	0 0 70 0 1117 1194 1109 1388
Boron 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 ASTM D5185m ASTM D5185m		0 1 73 <1 1089 1298 1147 1422 3468	3 0 68 <1 1108 1169 1176 1457 3345	0 0 70 0 1117 1194 1109 1388 3349
Boron 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 ASTM D5185m	limit/base	0 1 73 <1 1089 1298 1147 1422 3468 current	3 0 68 <1 1108 1169 1176 1457 3345 history1	0 0 70 0 1117 1194 1109 1388 3349 history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon	ppm ppm ppm ppm ppm ppm ppm ppm TS	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m <b>method</b>	limit/base	0 1 73 <1 1089 1298 1147 1422 3468 current 4	3 0 68 <1 1108 1169 1176 1457 3345 history1 3	0 0 70 0 1117 1194 1109 1388 3349 history2 3
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium	ppm ppm ppm ppm ppm ppm ppm ppm TS	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base >22 >31	0 1 73 <1 1089 1298 1147 1422 3468 <u>current</u> 4 0	3 0 68 <1 1108 1169 1176 1457 3345 history1 3 2	0 0 70 0 1117 1194 1109 1388 3349 history2 3 1
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium	ppm ppm ppm ppm ppm ppm ppm ppm TS	ASTM D5185m ASTM D5185m	limit/base >22 >31 >20	0 1 73 <1 1089 1298 1147 1422 3468 <u>current</u> 4 0 2	3 0 68 <1 1108 1169 1176 1457 3345 history1 3 2 <1	0 0 70 0 1117 1194 1109 1388 3349 history2 3 1 1 1
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED	ppm ppm ppm ppm ppm ppm ppm ppm TS ppm ppm ppm	ASTM D5185m ASTM D5185m	limit/base >22 >31 >20 limit/base	0 1 73 <1 1089 1298 1147 1422 3468 <u>current</u> 4 0 2 <u>current</u> 1.4	3 0 68 <1 1108 1169 1176 1457 3345 history1 3 2 <1 +	0 0 70 0 1117 1194 1109 1388 3349 history2 3 1 1 1 history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot %	ppm ppm ppm ppm ppm ppm ppm ppm TS ppm ppm ppm	ASTM D5185m ASTM D5185m	limit/base >22 >31 >20 limit/base >3	0 1 73 <1 1089 1298 1147 1422 3468 <u>current</u> 4 0 2 <u>current</u>	3 0 68 <1 1108 1169 1176 1457 3345 history1 3 2 <1 +istory1 0.8	0 0 70 0 1117 1194 1109 1388 3349 history2 3 1 1 1 history2 1.3
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % Nitration	ppm ppm ppm ppm ppm ppm ppm ppm t ppm ppm	ASTM D5185m ASTM D5185m	limit/base >22 >31 >20 limit/base >3 >20	0 1 73 <1 1089 1298 1147 1422 3468 <u>current</u> 4 0 2 <u>current</u> 1.4 9.6	3 0 68 <1 1108 1169 1176 1457 3345 history1 3 2 <1 2 <1 history1 0.8 8.2	0 0 70 0 1117 1194 1109 1388 3349 history2 3 1 1 1 history2 1.3 8.6
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation	ppm ppm ppm ppm ppm ppm ppm ppm TS ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D7844 *ASTM D7624 *ASTM D7415	limit/base >22 >31 >20 limit/base >3 >20 >30 limit/base	0 1 73 <1 1089 1298 1147 1422 3468 <i>current</i> 4 0 2 <i>current</i> 1.4 9.6 22.4 <i>current</i>	3 0 68 <1 1108 1169 1176 1457 3345 history1 3 2 <1 3 2 <1 history1 0.8 8.2 20.9 history1	0 0 70 0 1117 1194 1109 1388 3349 history2 3 1 1 1 history2 1.3 8.6 21.7 history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation	ppm ppm ppm ppm ppm ppm ppm ppm t ppm ppm	ASTM D5185m ASTM D5185m	Imit/base >22 >31 >20 Imit/base >3 >20 >30	0 1 73 <1 1089 1298 1147 1422 3468 <u>current</u> 4 0 2 <u>current</u> 1.4 9.6 22.4	3 0 68 <1 1108 1169 1176 1457 3345 history1 3 2 <1 3 2 <1 0.8 8.2 20.9	0 0 70 0 1117 1194 1109 1388 3349 history2 3 1 1 1 history2 1.3 8.6 21.7



# **OIL ANALYSIS REPORT**





	VISUAL		method	limit/base	current	history1	history2
^	White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
$\sim \sqrt{\sim}$	Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
	Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
	Silt	scalar	*Visual	NONE	NONE	NONE	NONE
	Debris	scalar	*Visual	NONE	NONE	NONE	NONE
	Sand/Dirt	scalar	*Visual	NONE	NONE	NONE	NONE
72 22 23	Appearance	scalar	*Visual	NORML	NORML	NORML	NORML
Mar15/19 Jul21/21 Dec12/22 Oct6/23	Odor	scalar	*Visual	NORML	NORML	NORML	NORML
	Emulsified Water		*Visual	>0.21	NEG	NEG	NEG
C	Free Water	scalar	*Visual	20.21	NEG	NEG	NEG
		scalar		12 12 11			
	FLUID PROPE			limit/base	current	history1	history2
Δ	Visc @ 100°C	cSt	ASTM D445	15.6	16.2	15.7	15.8
Am	GRAPHS						
	Iron (ppm)			40	Lead (ppm)		
23	0.000						
Mar15/18 Jul21/21 Dec12/22 Oct6/23	150			30		٨	
	Ē 100	Λ.	+++++++++++++++++++++++++++++++++++++++	톱 20	0	A the	
	50- Apnormal	AA	~	10		1	
		/ V	~~~		Abnormal		
	Sep27/10 Sep8/11 May15/14	Dec19/19	Jul21/21 Dec12/22	67/01	Sep27/10 Sep8/11 May15/14	Mar15/18 Dec19/19	Dec12/22 0ct6/23
	Sep2 Ser May1 Mar1	Deci	Deci	5	Sep 2 Nav 1	Decl	Decl
	Aluminum (ppm)				Chromium (pp	m)	
	<sup>60</sup> <b>Severe</b>			2	Severe		
	40						
	E 30 - Abnormal				Abnormal		
	20						
		$\sim$				$\sim$	
	0/1 8/11 8/18	61	1/21			61/ 19	122
	Sep27/10 Sep8/11 May15/14 Mar15/18	Dec19/19 -	Jul21/21 Dec12/22		Sep27/10 Sep8/11 May15/14	Mar15/18 Dec19/19	Dec12/22 0ct6/23
	Copper (ppm)				Silicon (ppm)		
	150 T 3			4			
	Severe			3	0 - Severe		······································
	100- E			Ĕd 2	Abnormal		
	50						
	Abnormal	+++++++		1	0	$\sim \sim \sim$	
			5	2			
	Sep27/10 Sep8/11 May15/18 Mar15/18	Dec19/19	Jul21/21 Dec12/22	1010/2	Sep27/10 Sep8/11 May15/14	Mar15/18 Dec19/19	Dec12/22
			r a	-		De	
	Viscosity @ 100°C				Base Number		
	30-			(B) H 10.	0 Base		~~~
				X 8.	0		
	다. 25- 정 20- 정 20-	^		.) and m			
		1	vm	(b)H01 Bm) Jack Kong H01 Bm) Jack Kong H01 Jack Kong H01 Jach Kong H01 Jach Kong H01 Jach Kong H01 H	Severe		
				0.	0		
	Sep27/10 Sep8/11 May15/14 Mar15/18	Dec19/19	Dec12/22	C7/01	Sep27/10 Sep8/11 May15/14	Mar15/18 Dec19/19	Dec12/22 0ct6/23
	Sep. Se Mavi	Deci	Jul	5	Sep. Se, May	Dec	
Certificate L2367							
To discuss this sample report	, contact Customer Serv	ice at 1-8	300-237-136				kempstone.com
* - Denotes test methods that	are outside of the ISO 1	7025 sco	ope of accred	litation.			T:
Statements of conformity to s	pecifications are based o	on the sir	nple accepta	nce decision	rule (JCGM 106	:2012)	F: