

OIL ANALYSIS REPORT

KEMP QUARRIES / BCS - GRAVETTE [68277] WL117

Component **Diesel Engine**

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

DIAGNOSIS

Recommendation

Resample at the next service interval to monitor. Please specify the component make and model with your next sample. (Customer Sample Comment: Pm3)

Wear

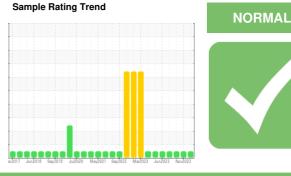
All component wear rates are normal.

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.

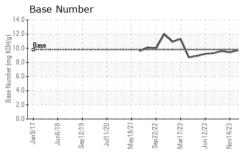


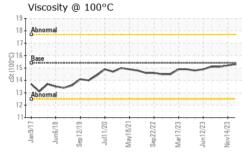


SAMPLE INFOR	MATION	method	limit/base	current	history1	history2
Sample Number		Client Info		PCA0069794	PCA06033099	PCA0086538
Sample Date		Client Info		06 Feb 2024	14 Nov 2023	14 Sep 2023
Machine Age	hrs	Client Info		20058	5854	5691
Oil Age	hrs	Client Info		5691	0	5691
Oil Changed		Client Info		Changed	N/A	Changed
Sample Status				NORMAL	NORMAL	NORMAL
CONTAMINAT	ION	method	limit/base	current	history1	history2
Fuel		WC Method	>5	<1.0	<1.0	<1.0
Water		WC Method	>0.2	NEG	NEG	NEG
Glycol		WC Method	20.L	NEG	NEG	NEG
WEAR METAL	c	method	limit/base	current	history1	history2
Iron	ppm		>100	16	18	15
Chromium	ppm	ASTM D5185m	>20	<1	<1	0
Nickel	ppm		>4	0	<1	0
Titanium	ppm	ASTM D5185m	0	0	<1	0
Silver	ppm	ASTM D5185m	>3	0	0	0
Aluminum	ppm	ASTM D5185m		4	3	1
Lead	ppm	ASTM D5185m	>40	1	<1	0
Copper	ppm	ASTM D5185m		0	<1	<1
Tin	ppm	ASTM D5185m	>15	0	<1	0
Vanadium	ppm	ASTM D5185m		<1	0	0
Cadmium	ppm	ASTM D5185m		0	<1	0
ADDITIVES		method	limit/base	current	history1	history2
ADDITIVES Boron	ppm	method ASTM D5185m	limit/base 0	<1	3	0
	ppm ppm					
Boron		ASTM D5185m	0	<1	3	0 12 65
Boron Barium	ppm	ASTM D5185m ASTM D5185m	0	<1 0	3 11	0 12
Boron Barium Molybdenum	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60	<1 0 68	3 11 63	0 12 65
Boron Barium Molybdenum Manganese	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0	<1 0 68 <1	3 11 63 <1	0 12 65 0
Boron Barium Molybdenum Manganese Magnesium	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010	<1 0 68 <1 1137	3 11 63 <1 982	0 12 65 0 1049
Boron Barium Molybdenum Manganese Magnesium Calcium	ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010 1070	<1 0 68 <1 1137 1343	3 11 63 <1 982 1120	0 12 65 0 1049 1201
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	0 0 60 0 1010 1070 1150	<1 0 68 <1 1137 1343 1186	3 11 63 <1 982 1120 974	0 12 65 0 1049 1201 1076
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	0 0 60 0 1010 1070 1150 1270	<1 0 68 <1 1137 1343 1186 1416	3 11 63 <1 982 1120 974 1217	0 12 65 0 1049 1201 1076 1273
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	0 0 60 0 1010 1070 1150 1270 2060	<1 0 68 <1 1137 1343 1186 1416 3210	3 11 63 <1 982 1120 974 1217 3319	0 12 65 0 1049 1201 1076 1273 3523
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	0 0 60 1010 1070 1150 1270 2060	<1 0 68 <1 1137 1343 1186 1416 3210 current	3 11 63 <1 982 1120 974 1217 3319 history1	0 12 65 0 1049 1201 1076 1273 3523 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 ASTM D5185m	0 0 60 0 1010 1070 1150 1270 2060 limit/base	<1 0 68 <1 1137 1343 1186 1416 3210 current 11	3 11 63 <1 982 1120 974 1217 3319 history1 8	0 12 65 0 1049 1201 1076 1273 3523 history2 9
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	0 0 60 0 1010 1070 1150 1270 2060 limit/base	<1 0 68 <1 1137 1343 1186 1416 3210 current 11 2	3 11 63 <1 982 1120 974 1217 3319 history1 8 <	0 12 65 0 1049 1201 1076 1273 3523 history2 9 9
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	0 0 0 1010 1070 1150 1270 2060 limit/base >25 >20	<1 0 68 <1 1137 1343 1186 1416 3210 current 11 2 2	3 11 63 <1 982 1120 974 1217 3319 history1 8 <1 2	0 12 65 0 1049 1201 1076 1273 3523 history2 9 9 9
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	0 0 0 1010 1070 1150 1270 2060 2060 225 >25 >20 Limit/base >20	<1 0 68 <1 1137 1343 1186 1416 3210 current 11 2 2 2 current	3 11 63 <1 982 1120 974 1217 3319 history1 8 <1 2 history1	0 12 65 0 1049 1201 1076 1273 3523 history2 9 9 9 11 11 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	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 2060 225 >25 >20 Limit/base >20	<1 0 68 <1 1137 1343 1186 1416 3210 current 11 2 2 2 current 0.9	3 11 63 <1 982 1120 974 1217 3319 history1 8 <1 2 history1 0.8	0 12 65 0 1049 1201 1076 1273 3523 history2 9 9 9 11 history2 0.6
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 ppm ppm	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 2060 225 220 220 1imit/base >22 20	<1 0 68 <1 1137 1343 1186 1416 3210 current 11 2 2 2 current 0.9 7.5	3 11 63 <1 982 1120 974 1217 3319 history1 8 <1 2 history1 0.8 7.2	0 12 65 0 1049 1201 1076 1273 3523 history2 9 9 9 11 history2 0.6 6.7
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 ppm ppm	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 2060 225 20 225 20 20 320 33 20 20	<1 0 68 <1 1137 1343 1186 1416 3210 current 11 2 2 2 current 0.9 7.5 20.0	3 11 63 <1 982 1120 974 1217 3319 history1 8 <1 2 history1 0.8 7.2 19.8	0 12 65 0 1049 1201 1076 1273 3523 history2 9 9 9 11 history2 0.6 6.7 19.2



OIL ANALYSIS REPORT





	White	SUAL e Metal w Metal		scalar scalar	*Visu		limit/ba NONE NONE		NON			N	histo ONE ONE			histo NONE NONE					
		pitate		scalar			NONE		NO				ONE								
	Silt	pitato		scalar			NONE		NO				ONE			IONE					
	Debr	ie		scalar			NONE		NO				ONE								
	Sand	-		scalar			NONE		NO				ONE			ONE					
23		arance		scalar			NORML		NOF					1		JORN					
Jun 12/23 Nov 14/23	Odor						NORML		NOF				ORM			JORN					
¬ ≥		sified Wat	tor	scalar				-	NEC				EG	L		NEG	IL				
		Water	lei	scalar scalar			>0.2		NEC	-			EG			NEG					
	FL		OPE	RTIES	s me	thod	limit/ba	ise	CL	rrent			histo	ry1		histo	ry2				
		@ 100°C		cSt	ASTN	1 D445	15.4		15.3			15	5.2		1	5.1					
		RAPHS								(
	250 T	n (ppm)						¹⁰⁰ T	Lead	(ppn	1) 										
4/23	200 - Seve	re						80-	Severe												
Jun 12/23 Nov 14/23	ε ¹⁵⁰				~			e ⁶⁰	dere en												
	100 Abn	ərmal	~		f			ud 40	Abnorm	al											
	50-		\backslash		/ \			20-													
								0	-		- 2	0	21	2	5	en.	5				
	Jan 9/17	Jun6/18 Sep12/19	Jul11/20	May18/21	Sep.22/22 Mar17/23	Jun12/23	Nov14/23		Jan 9/17	o I /gunc	sep 1 2/19	Jul11/20	May18/21	Sep22/22	Mar17/23	Jun12/23	Nov14/23				
				× c	N.	ηn	No				//	-	Ň	Se	M	٦ſ	No				
	50 T	minum (p)pm)					50 -	Chror	nium	(pp	om)									
	40 - Seve	re						40	Severe				1 1	1 1 1	1 1 1						
	_ 30 -							_ 30-													
	20 - Abn	ormal	A		\square			ط ³⁰	Abnorm	al	-			_		_	4				
	10-		$ \land $		$ \rangle$			10-													
				\sim		1	-	0			1			-	~		ų,				
	Jan 9/17	Jun6/18 Sep12/19	Jul11/20	May18/21	Sep.22/22 Mar17/23	Jun12/23	Nov14/23		Jan9/17	o I /ounc	šep 1 2/1 9	Jul11/20	May18/21	Sep22/22	Mar17/23	Jun12/23	Nov14/23				
	Pa	Ju Sep	InL	May o	Mar	ղոր	Nov		P -	n d	Sep	lul	May	Sep	Mar	սոր	Nov				
	400	oper (ppn	1)						Silico	ו (pp	m)										
	400 Severe					150															
	300							_ 100	Severe					ſ							
	틆 200							طط 50 -	Abnormal			$ \land \land \land$									
					3			0	~	\sim	1	-	¥			\sim	3				
	0			2 0	2/2	Jun12/23	Nov14/23		Jan9/17	01/gunn	Sep 1 2/1 9	Jul11/20	May18/21	Sep22/22	Mar17/23	Jun12/23	Nov14/23				
	Jan 9/17	Jun6/18 -	Jul11/20	Aay18	vep.∠ Nar1	In	NO			5.	8		Base Number								
	Vise Vise	cosity @	02/11/nr 100°C	-	Sep 22/22 Mar17/23	Jun	Nav					Γ									
	Vise 20				Sep.	un (15.0-	Base			7									
		cosity @ 1			Sep.	unr		15.0-				7			7						
	20 18 (0-001) 14	cosity @ 1			Sept	un		15.0-	Base			7			~						
	Vise	cosity @ 1			Sep.	unr		15.0-	Base					_	~						
	20 18 (0-001) 15 10 12 10	cosity @ 1	100°C						Base	Num	ber			2	~	3	3				
	20 18 (0-001) 15 10 12 10	cosity @ 1	100°C					15.0	Base	Num	ber		w18/21	p22/22	v17/23	n12/23	v14/23				
	20 18 (0-001) 314 12	cosity @ 1			Apple States State	unf		15.0	Base	Num		Juli 1/20	May18/21	Sep22/22	Mar17/23	Jun 12/23	Nov14/23				
oratory	20 18 (0-001) 350 10 L//Ruer	cosity @ 1	100°C	May18/21	sep.L/L/L	Jun12/23	Nov14/23	15.0 Base Number (mg KOH/g) 5.0 0.0	Base	Num	ber fl/71dag	Jul11/20									
oratory nple No.	20 18 (0-001) 350 10 L//Ruer	cosity @ 1 prmal 6U21des 6U21des Check US/	100°C	-12/81/kew 1 Madis	sep.L/L/L	., Cary	Nov14/23	(15.0 10.0 10.0 10.0 10.0 13	Base	Num	ber fl/71dag	Jul11/20		on Cou	inty Sto	one - G	rave				
nple No. Number	Ulguer Visa 0,0001143 10 10 10 10 10 10 10 10 10 10 10 10 10	cosity @ 1 mma 80,000 0,000000	100°C	1 Madis Reco Test	on Ave bived ed	ویکراسم , Cary : 26 : 27	e74400 7, NC 275 6 Feb 202 7 Feb 202	(B/HO y Bull 15.0 B/HO y Bull 10.0 5.0 0.0 13 24 24	Base	Kem	ber fl/71dag	Jul11/20		on Cou 1	I nty Sto 5100 hur S	one - G N Hy pring:	rave vy t s, A				
nple No. Number ue Number	Ulguer Visa 0,0001143 10 10 10 10 10 10 10 10 10 10 10 10 10	cosity @ 1 mma emma emma emma emma emma emma emma	100°C	1 Madis Reco Test Diag	ed nosed	ویکراسم , Cary : 26 : 27	ezthown , NC 275 5 Feb 202	(B/HO y Bull 15.0 B/HO y Bull 10.0 5.0 0.0 13 24 24	Base	Kem	ber fl/71dag	Jul11/20		on Cou 1	I nty Sto 5100 hur S	one - G N Hy pring: US 7	rave vy 5 s, A 276				
	User User	cosity @ 1 amal emal emal elizides check US/ 069794 654 884 (Additio	100°C 07(1)19 A - 50 ⁻ nal Te	1 Madis Reco Test Diag sts: TB	ed nosed N)	ویریا د., Cary : 26 : 27 : 28	r, NC 275 5 Feb 202 7 Feb 202 Feb 2024	(B/HO y Bull 15.0 B/HO y Bull 10.0 5.0 0.0 13 24 24	Base	Num Num Kemj	BL/ZIdas	oz/Luinf	Bento	on Cou 1 Sulp	i nty Sto 15100 hur S	one - G N Hy pring:	rave vy 5 s, A 276				



Report Id: KEMSUL [WUSCAR] 06100654 (Generated: 02/28/2024 14:06:31) Rev: 1