

OIL ANALYSIS REPORT









KEMP QUARRIES / RIVER VALLEY OZARK WL112

Component **Diesel Engine**

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

DIAGNOSIS

Recommendation

Resample at the next service interval to monitor.

All component wear rates are normal.

Contamination

There is no indication of any contamination in the

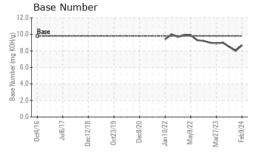
Fluid Condition

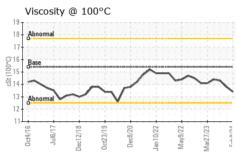
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

Cample Date Client Info 09 Feb 2024 09 Oct 2023 05 Jul 2023 34827 34304 34827 34304 34828 34827 34304 34828 34827 34304 34828 34828 34827 34304 34828	N SHP 15W40 (GAL) #2018 Ju2017 De2018 Out2019 De2020 Jue2022 May2022 May2023 Feb.20						
Cample Date Client Info 09 Feb 2024 09 Oct 2023 05 Jul 2023 34827 34304 34827 34304 34828 34827 34304 34828 34827 34304 34828 34828 34827 34304 34828	SAMPLE INFOR	MATION	method	limit/base	current	history1	history2
Machine Age hrs Client Info 35658 34927 34304 Dil Age hrs Client Info 32626	Sample Number		Client Info		PCA0084501	PCA0069680	PCA0069770
Dil Age	Sample Date		Client Info		09 Feb 2024	09 Oct 2023	05 Jul 2023
Dil Changed Client Info N/A N/A N/A NORMAL NORMAL NORMAL NORMAL	Machine Age	hrs	Client Info		35658	34927	34304
CONTAMINATION method limit/base current history1 history2	Oil Age	hrs	Client Info		32626	32626	32626
CONTAMINATION method limit/base current history1 history2	Oil Changed		Client Info		N/A	N/A	N/A
Fuel	Sample Status				NORMAL	NORMAL	NORMAL
Water WC Method WC Method >0.2 NEG NEG NEG NEG NEG NEG NEG NEG WEAR METALS method limit/base current history1 history2 ron ppm ASTM D5185m >100 19 15 47 Chromium ppm ASTM D5185m >20 <1	CONTAMINAT	ION	method	limit/base	current	history1	history2
NEG Neg	-uel		WC Method	>5	<1.0	<1.0	<1.0
WEAR METALS method limit/base current history1 history2 ron ppm ASTM D5185m >100 19 15 47 Chromium ppm ASTM D5185m >20 <1	Water		WC Method	>0.2	NEG	NEG	NEG
Chromium	Glycol		WC Method		NEG	NEG	NEG
Chromium	WEAR METAL	.S	method	limit/base	current	history1	history2
Strickel	ron	ppm	ASTM D5185m	>100	19	15	47
Silver	Chromium	ppm	ASTM D5185m	>20	<1	<1	<1
Silver	Nickel	ppm	ASTM D5185m	>2	<1	<1	0
Aluminum	Γitanium	ppm	ASTM D5185m	>2	<1	<1	<1
Lead	Silver	ppm	ASTM D5185m	>2	<1	0	0
Copper	Aluminum	ppm	ASTM D5185m	>25	1	1	6
Tin	_ead	ppm	ASTM D5185m	>40	2	<1	<1
Azanadium ppm ASTM D5185m <1 <1 0 Cadmium ppm ASTM D5185m <1 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 4 <1 2 Barium ppm ASTM D5185m 0 0 12 0 Molybdenum ppm ASTM D5185m 0 57 55 57 Manganese ppm ASTM D5185m 0 <1 <1 <1 <1 Magnesium ppm ASTM D5185m 1010 884 897 932 Calcium ppm ASTM D5185m 1070 997 961 1028 Phosphorus ppm ASTM D5185m 1270 1138 1156 1267 Sulfur ppm ASTM D5185m 2060 3359 2873 3699 CONTAMINANTS method limit/base current <	Copper	ppm	ASTM D5185m	>330	3	3	4
ADDITIVES	Γin	ppm	ASTM D5185m	>15	<1	<1	<1
ADDITIVES	/anadium	ppm	ASTM D5185m		<1	<1	0
Soron ppm ASTM D5185m 0 4 <1 2 2 2 2 2 3 2 2 3 2 3 3	Cadmium	ppm	ASTM D5185m		<1	0	0
Description	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum ppm ASTM D5185m 60 57 55 57 Manganese ppm ASTM D5185m 0 <1 <1 <1 Magnesium ppm ASTM D5185m 1010 884 897 932 Calcium ppm ASTM D5185m 1070 997 961 1028 Phosphorus ppm ASTM D5185m 1150 913 954 1029 Zinc ppm ASTM D5185m 1270 1138 1156 1267 Sulfur ppm ASTM D5185m 2060 3359 2873 3699 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 5 3 15 Sodium ppm ASTM D5185m >20 2 3 2 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7824 <td>Boron</td> <td>ppm</td> <td>ASTM D5185m</td> <td>0</td> <td>4</td> <td><1</td> <td>2</td>	Boron	ppm	ASTM D5185m	0	4	<1	2
Manganese ppm ASTM D5185m 0 <1 <1 <1 Magnesium ppm ASTM D5185m 1010 884 897 932 Calcium ppm ASTM D5185m 1070 997 961 1028 Phosphorus ppm ASTM D5185m 1150 913 954 1029 Zinc ppm ASTM D5185m 1270 1138 1156 1267 Sulfur ppm ASTM D5185m 2060 3359 2873 3699 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 5 3 15 Godium ppm ASTM D5185m >20 2 3 2 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7624 >20 6.1 5.9 7.1 Sulfation Abs/:mm *ASTM D7415	Barium	ppm	ASTM D5185m	0	0	12	0
Magnesium ppm ASTM D5185m 1010 884 897 932 Calcium ppm ASTM D5185m 1070 997 961 1028 Phosphorus ppm ASTM D5185m 1150 913 954 1029 Zinc ppm ASTM D5185m 1270 1138 1156 1267 Sulfur ppm ASTM D5185m 2060 3359 2873 3699 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 5 3 15 Sodium ppm ASTM D5185m >20 2 3 2 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.5 1 1.9 Silicon Abs/.1mm *ASTM D7624 >20 6.1 5.9 7.1 Silicon Abs/.1mm *ASTM D7414	Molybdenum	ppm	ASTM D5185m	60	57	55	57
Calcium ppm ASTM D5185m 1070 997 961 1028 Phosphorus ppm ASTM D5185m 1150 913 954 1029 Zinc ppm ASTM D5185m 1270 1138 1156 1267 Sulfur ppm ASTM D5185m 2060 3359 2873 3699 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 5 3 15 Sodium ppm ASTM D5185m >20 2 3 2 Potassium ppm ASTM D5185m >20 2 3 2 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.5 1 1.9 Nitration Abs/.1mm *ASTM D7415 >30 18.2 18.5 21.4 FLUID DEGRADATION method <td>Manganese</td> <td>ppm</td> <td>ASTM D5185m</td> <td>0</td> <td><1</td> <td><1</td> <td><1</td>	Manganese	ppm	ASTM D5185m	0	<1	<1	<1
Phosphorus ppm ASTM D5185m 1150 913 954 1029 Zinc ppm ASTM D5185m 1270 1138 1156 1267 Sulfur ppm ASTM D5185m 2060 3359 2873 3699 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 5 3 15 Sodium ppm ASTM D5185m >20 2 3 2 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.5 1 1.9 Nitration Abs/cm *ASTM D7624 >20 6.1 5.9 7.1 Sulfation Abs/.1mm *ASTM D7415 >30 18.2 18.5 21.4 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm	Magnesium	ppm	ASTM D5185m	1010	884	897	932
Time	Calcium	ppm	ASTM D5185m	1070	997	961	1028
Sulfur ppm ASTM D5185m 2060 3359 2873 3699 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 5 3 15 Sodium ppm ASTM D5185m >20 2 3 2 Potassium ppm ASTM D5185m >20 2 3 2 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.5 1 1.9 Nitration Abs/cm *ASTM D7624 >20 6.1 5.9 7.1 Sulfation Abs/.1mm *ASTM D7415 >30 18.2 18.5 21.4 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 13.5 12.4 14.7	Phosphorus	ppm	ASTM D5185m	1150	913	954	1029
CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 5 3 15 Sodium ppm ASTM D5185m <1	Zinc	ppm	ASTM D5185m	1270	1138	1156	1267
Solition ppm ASTM D5185m >25 5 3 15	Sulfur	ppm	ASTM D5185m	2060	3359	2873	3699
Sodium ppm ASTM D5185m <1 1 2 Potassium ppm ASTM D5185m >20 2 3 2 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.5 1 1.9 Nitration Abs/cm *ASTM D7624 >20 6.1 5.9 7.1 Sulfation Abs/.1mm *ASTM D7415 >30 18.2 18.5 21.4 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 13.5 12.4 14.7	CONTAMINANTS method limit/base current history1 history2						
Potassium ppm ASTM D5185m >20 2 3 2 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.5 1 1.9 Nitration Abs/cm *ASTM D7624 >20 6.1 5.9 7.1 Sulfation Abs/.1mm *ASTM D7415 >30 18.2 18.5 21.4 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 13.5 12.4 14.7	Silicon	ppm	ASTM D5185m	>25	5	3	15
INFRA-RED	Sodium	ppm	ASTM D5185m		<1	1	2
Soot % % *ASTM D7844 >3 0.5 1 1.9 Nitration Abs/cm *ASTM D7624 >20 6.1 5.9 7.1 Sulfation Abs/.1mm *ASTM D7415 >30 18.2 18.5 21.4 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 13.5 12.4 14.7	Potassium	ppm	ASTM D5185m	>20	2	3	2
Nitration Abs/cm *ASTM D7624 >20 6.1 5.9 7.1 Sulfation Abs/.1mm *ASTM D7415 >30 18.2 18.5 21.4 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 13.5 12.4 14.7	INFRA-RED		method	limit/base	current	history1	history2
Nitration Abs/cm *ASTM D7624 >20 6.1 5.9 7.1 Sulfation Abs/.1mm *ASTM D7415 >30 18.2 18.5 21.4 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 13.5 12.4 14.7	Soot %	%	*ASTM D7844	>3	0.5	1	1.9
Sulfation Abs/.1mm *ASTM D7415 >30 18.2 18.5 21.4 FLUID DEGRADATION method limit/base current history1 history2 Dxidation Abs/.1mm *ASTM D7414 >25 13.5 12.4 14.7	Nitration	Abs/cm	*ASTM D7624	>20		5.9	7.1
Oxidation	Sulfation						
	FLUID DEGRA	OATION	method	limit/base	current	history1	history2
	 Oxidation	Abs/.1mm	*ASTM D7414	>25	13.5	12.4	14.7
	Base Number (BN)	mg KOH/g			8.7	8.0	



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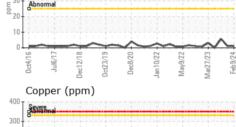


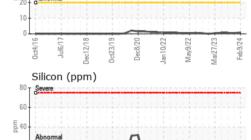


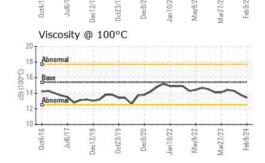
VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual	NONE	NONE	NONE	NONE
Appearance	scalar	*Visual	NORML	NORML	NORML	NORML
Odor	scalar	*Visual	NORML	NORML	NORML	NORML
Emulsified Water	scalar	*Visual	>0.2	NEG	NEG	NEG
Free Water	scalar	*Visual		NEG	NEG	NEG

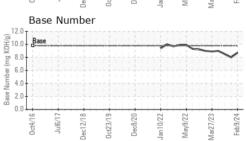
L LOID FUOL		memou			HISTOLAL	HISTOLA
Visc @ 100°C	cSt	ASTM D445	15.4	13.4	13.8	14.3

GNAFIS	
Iron (ppm)	Lead (ppm)
200 Severe	80 Severe
150 - Abnormal	E 60 40 - Abnormal
50 ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~	20
0ct4/16 Jul6/17 Dec12/18 0ct23/19 Dec8/20 Jan10/22 May9/22 Mar27/23	0ct4/16 Jul6/17 Dec12/18 Oct23/19 Dec8/20
Aluminum (ppm)	Chromium (ppm)
50 40 Severe	50 Severe
Abnormal	g 30











Laboratory Sample No. Unique Number : 10885012

Lab Number : 06092159

E 200 100

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 : PCA0084501

Received **Tested** Diagnosed

: 16 Feb 2024 : 19 Feb 2024

: 19 Feb 2024 - Wes Davis

Kemp Quarries - River Valley - Ozark 9446 N Hwy 309

Ozark, AR US 72949 Contact:

Test Package : MOB 1 (Additional Tests: TBN) To discuss this sample report, contact Customer Service at 1-800-237-1369.

ozark@rivervalleyquarries.com

* - 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)

T:

F: