

OIL ANALYSIS REPORT

Sample Rating Trend





Machine Id **CATERPILLAR D6 10032 (S/N KEW01099)** Component **Diesel Engine**

PETRO CANADA DURON XL SYN BLEND 15W40 (--- GAL)

Sample Number Client Info WC083717 WC0816277 WC079759 Sample Date Client Info 08 Aug 2023 14 Jun 2023 26 Apr 2023 Machine Age hrs Client Info 4040 3725 3256 Oil Age hrs Client Info 315 469 462 Oil Changed Client Info 315 469 462 Oil Changed Client Info 315 469 462 Oll Age Client Info Stanged NORMAL NORMAL NORMAL CONTAMINATION method Imit/base current history1 history1 Glycol WC Method >5 <1.0 <1.0 <1.0 Glycol WC Method >5 <1.0 <1 <1 <1 Kino Sitism >100 8 21 29 Chromium pm ASTM 051555 >2 0 0 0 0 0 0 0 0 0 0 0 0	SYN BLEND 15W40	(GAL)	Nov2022	lov2022 Jan2023 Feb20	23 Mar2023 Apr2023 Jun2023	Aug2023	
Sample Date Client Info 08 Aug 2023 14 Jun 2023 28 Apr 2023 Machine Age hrs Client Info 4040 3725 3256 Oil Age hrs Client Info 315 469 462 Oil Changed Client Info Changed NORMAL NORMA	SAMPLE INFOR	MATION	method	limit/base	current	history1	history2
Machine Age hrs Client Info 4040 3725 3256 Dil Age hrs Client Info 315 469 462 Dil Ghanged Client Info 315 469 462 Dil Ghanged Client Info NORIMAL NORI	Sample Number		Client Info		WC0837117	WC0816277	WC0797696
Oil Age hrs Client Info 315 469 462 Oil Changed Client Info Changed Changed Changed Changed Changed Changed NORMAL NO	Sample Date		Client Info		08 Aug 2023	14 Jun 2023	26 Apr 2023
Dil Changed Sample StatusClient InfoChanged NORMALChanged NORMALChanged NORMALCONTAMINATIONmethodimit/basecurrenthistory1history2FuelWC Method>5<1.0	Machine Age	hrs	Client Info		4040	3725	3256
Dil Changed Sample StatusClient InfoChanged NORMALChanged NORMALChanged NORMALCONTAMINATIONmethodimit/basecurrenthistory1history2FuelWC Method>5<1.0	Oil Age	hrs	Client Info		315	469	462
Sample Status NORMAL NORMAL NORMAL NORMAL CONTAMINATION method limit/base current history1 history1 Fuel WC Method >5 <1.0	-				Changed	Changed	Changed
Fuel WC Method >5 <1.0 <1.0 <1.0 Glycol WC Method NEG NEG NEG NEG WEAR METALS method limit/base current history1 history1 Iron ppm ASTM D5185m >20 <1 <1 <1 Nickel ppm ASTM D5185m >20 <1 <1 <1 <1 Nickel ppm ASTM D5185m >2 0 0 0 0 Silver ppm ASTM D5185m >2 0 0 0 0 Additionum ppm ASTM D5185m >2 0 0 0 0 Adambinum ppm ASTM D5185m >40 0 1 4 8 Silver ppm ASTM D5185m 0 0 0 0 0 Cadmium ppm ASTM D5185m 1 0 0 1 1 1 1 2	0				•	U	0
Glycol WC Method NEG NEG NEG NEG WEAR METALS method limit/base current history1 history1 Iron ppm ASTM D5185m >20 <1	CONTAMINATIC	N	method	limit/base	current	history1	history2
WEAR METALS method limit/base current history1 history1 iron ppm ASTM D5185m >100 8 21 29 Chromium ppm ASTM D5185m >20 <1	Fuel		WC Method	>5	<1.0	<1.0	<1.0
Iron ppm ASTM D5185m >100 8 21 29 Chromium ppm ASTM D5185m >20 <1	Glycol		WC Method		NEG	NEG	NEG
Dromium ppm ASTM D5185m >20 <1 <1 <1 Nickel ppm ASTM D5185m >2 0 0 <1	WEAR METALS		method	limit/base	current	history1	history2
Chromium ppm ASTM D5185m >20 <1 <1 <1 Nickel ppm ASTM D5185m >2 0 0 <1	ron	ppm	ASTM D5185m	>100	8	21	29
Nickel ppm ASTM D5185m >2 0 0 <1 Titanium ppm ASTM D5185m >2 0 0 0 Silver ppm ASTM D5185m >25 0 <1	Chromium		ASTM D5185m	>20	<1	<1	<1
Titanium ppm ASTM D5185m >2 0 0 0 Silver ppm ASTM D5185m >2 0 0 0 Aluminum ppm ASTM D5185m >25 0 <1							
Silver ppm ASTM D5185m >2 0 0 0 Aluminum ppm ASTM D5185m >25 0 <1							
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Lead ppm ASTM D5185m >40 0 1 4 Copper ppm ASTM D5185m >330 <1					-		
Copper ppm ASTM D5185m >330 <1 14 88 Tin ppm ASTM D5185m >15 0 <1					-		
Tin ppm ASTM D5185m >15 0 <1 1 Vanadium ppm ASTM D5185m 0 0 0 0 Cadmium ppm ASTM D5185m 0 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 1 <1					-		
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Cadmium ppm ASTM D5185m 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 1 <1 4 8 Barium ppm ASTM D5185m 1 o 0 0 0 Magnesium ppm ASTM D5185m 1 0 0 0 0 Calcium ppm ASTM D5185m 1 0 <1 <1 <1 <1 <1 <1 <1 <1 4 8 Magnesium ppm ASTM D5185m 1010 984 1022 1018 Calcium ppm ASTM D5185m 1070 1168 1178 1184 Phosphorus ppm ASTM D5185m 1270 1409 1428 1325 Sulfur ppm ASTM D5185m 2060 4202 3821 2667 CONTAMINANTS method limit/base curren				>15			
ADDITIVES nethod limit/base current history1 history2 Boron ppm ASTM D5185m 1 <1					-		
Boron ppm ASTM D5185m 1 <1 4 8 Barium ppm ASTM D5185m 1 0 0 0 Molybdenum ppm ASTM D5185m 60 56 62 65 Manganese ppm ASTM D5185m 1 0 <1	Cadmium	ppm	ASTM D5185m		0	0	0
Barium ppm ASTM D5185m 1 0 0 0 Molybdenum ppm ASTM D5185m 60 56 62 65 Magnesse ppm ASTM D5185m 1 0 <1 <1 Magnesium ppm ASTM D5185m 1010 984 1022 1018 Calcium ppm ASTM D5185m 1070 1168 1178 1184 Phosphorus ppm ASTM D5185m 1070 1168 1178 1184 Phosphorus ppm ASTM D5185m 1270 1409 1428 1325 Sulfur ppm ASTM D5185m 2060 4202 3821 2667 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 2 4 3 Sodium ppm ASTM D5185m >20 0 <1 4 INFRA-RED method limit/base	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum ppm ASTM D5185m 60 56 62 65 Manganese ppm ASTM D5185m 1 0 <1	Boron	ppm	ASTM D5185m	1	<1	4	8
Maganese ppm ASTM D5185m 1 0 <1 <1 Magnesium ppm ASTM D5185m 1010 984 1022 1018 Calcium ppm ASTM D5185m 1070 1168 1178 1184 Phosphorus ppm ASTM D5185m 1070 1168 1178 1184 Phosphorus ppm ASTM D5185m 1150 1092 1066 973 Zinc ppm ASTM D5185m 1270 1409 1428 1325 Sulfur ppm ASTM D5185m 2060 4202 3821 2667 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 2 4 3 Sodium ppm ASTM D5185m >20 0 <11	Barium	ppm	ASTM D5185m	1	0	0	0
Magnesium ppm ASTM D5185m 1010 984 1022 1018 Calcium ppm ASTM D5185m 1070 1168 1178 1184 Phosphorus ppm ASTM D5185m 1150 1092 1066 973 Zinc ppm ASTM D5185m 1270 1409 1428 1325 Sulfur ppm ASTM D5185m 2060 4202 3821 2667 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 2 4 3 Sodium ppm ASTM D5185m >20 0 <1	Molybdenum	ppm	ASTM D5185m	60	56	62	65
Calcium ppm ASTM D5185m 1070 1168 1178 1184 Phosphorus ppm ASTM D5185m 1150 1092 1066 973 Zinc ppm ASTM D5185m 1270 1409 1428 1325 Sulfur ppm ASTM D5185m 2060 4202 3821 2667 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 2 4 3 Sodium ppm ASTM D5185m >20 0 <11	Vanganese	ppm	ASTM D5185m	1	0	<1	<1
Phosphorus ppm ASTM D5185m 1150 1092 1066 973 Zinc ppm ASTM D5185m 1270 1409 1428 1325 Sulfur ppm ASTM D5185m 2060 4202 3821 2667 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 2 4 3 Sodium ppm ASTM D5185m >20 0 <11 2 Potassium ppm ASTM D5185m >20 0 <11 4 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.3 0.6 0.7 Nitration Abs/cm *ASTM D7624 >20 6.1 7.8 8.6 Sulfation Abs/.1mm *ASTM D7415 >30 18.0 20.5 18.6 FLUID DEGRADATION method l	Magnesium	ppm	ASTM D5185m	1010	984	1022	1018
Phosphorus ppm ASTM D5185m 1150 1092 1066 973 Zinc ppm ASTM D5185m 1270 1409 1428 1325 Sulfur ppm ASTM D5185m 2060 4202 3821 2667 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 2 4 3 Sodium ppm ASTM D5185m >20 0 <11 2 Potassium ppm ASTM D5185m >20 0 <11 4 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.3 0.6 0.7 Nitration Abs/cm *ASTM D7624 >20 6.1 7.8 8.6 Sulfation Abs/.1mm *ASTM D7415 >30 18.0 20.5 18.6 FLUID DEGRADATION method l	Calcium	ppm	ASTM D5185m	1070	1168	1178	1184
Zinc ppm ASTM D5185m 1270 1409 1428 1325 Sulfur ppm ASTM D5185m 2060 4202 3821 2667 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 2 4 3 Sodium ppm ASTM D5185m >20 0 <1	Phosphorus		ASTM D5185m	1150	1092	1066	973
Sulfur ppm ASTM D5185m 2060 4202 3821 2667 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 2 4 3 Sodium ppm ASTM D5185m >20 0 <1			ASTM D5185m	1270	1409	1428	1325
Silicon ppm ASTM D5185m >25 2 4 3 Sodium ppm ASTM D5185m 0 <1 2 Potassium ppm ASTM D5185m >20 0 <1 2 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.3 0.6 0.7 Nitration Abs/cm *ASTM D7624 >20 6.1 7.8 8.6 Sulfation Abs/cm *ASTM D7624 >20 6.1 7.8 8.6 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 13.4 16.8 16.6							
Sodium ppm ASTM D5185m 0 <1 2 Potassium ppm ASTM D5185m >20 0 <1	CONTAMINANT	S	method	limit/base	current	history1	history2
Sodium ppm ASTM D5185m 0 <1 2 Potassium ppm ASTM D5185m >20 0 <1	Silicon	ppm	ASTM D5185m	>25	2	4	3
Potassium ppm ASTM D5185m >20 0 <1 4 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.3 0.6 0.7 Nitration Abs/cm *ASTM D7624 >20 6.1 7.8 8.6 Sulfation Abs/.1mm *ASTM D7415 >30 18.0 20.5 18.6 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 13.4 16.8 16.6	Sodium	ppm	ASTM D5185m		0	<1	2
Soot % % *ASTM D7844 >3 0.3 0.6 0.7 Nitration Abs/cm *ASTM D7624 >20 6.1 7.8 8.6 Sulfation Abs/.1mm *ASTM D7415 >30 18.0 20.5 18.6 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 13.4 16.8 16.6	Potassium		ASTM D5185m	>20	0	<1	4
Nitration Abs/cm *ASTM D7624 >20 6.1 7.8 8.6 Sulfation Abs/.1mm *ASTM D7615 >30 18.0 20.5 18.6 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 13.4 16.8 16.6	INFRA-RED		method	limit/base	current	history1	history2
Nitration Abs/cm *ASTM D7624 >20 6.1 7.8 8.6 Sulfation Abs/.1mm *ASTM D7615 >30 18.0 20.5 18.6 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 13.4 16.8 16.6	Soot %	%	*ASTM D7844	>3	0.3	0.6	0.7
Sulfation Abs/.1mm *ASTM D7415 >30 18.0 20.5 18.6 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 13.4 16.8 16.6							
Oxidation Abs/.1mm *ASTM D7414 >25 13.4 16.8 16.6							
	FLUID DEGRAD	ATION	method	limit/base	current	history1	history2
	Oxidation	Abs/.1mm	*ASTM D7414	>25	13.4	16.8	16.6
	Base Number (BN)	mg KOH/g		9.6	8.5	7.9	6.6

DIAGNOSIS

Recommendation

Resample at the next service interval to monitor.

Fluid

Wear

All component wear rates are normal.

Contamination

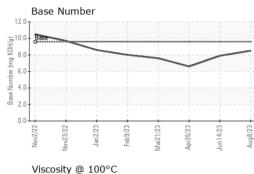
There is no indication of any contamination in the oil.

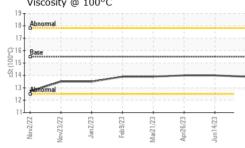
Fluid Condition

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

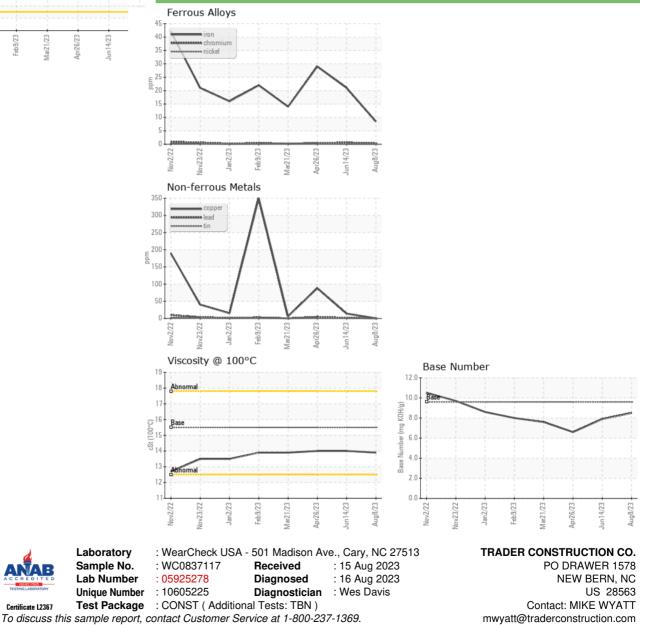


OIL ANALYSIS REPORT





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
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
FLUID PROPERT	IES	method	limit/base	current	history1	history2
Visc @ 100°C	cSt	ASTM D445	15.5	13.9	14.0	14.0
GRAPHS						



* - 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)

E

Certificate L2367

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