

OIL ANALYSIS REPORT

Sample Rating Trend





Area (TK214OJO) Machine Id 713034

Component Diesel Engine

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

Sample Number Client Info GFL0096869 GFL0091696 Sample Date Client Info 11 Jan 2024 23 Oct 2023 Machine Age hrs Client Info 0 2949 Oil Age hrs Client Info Changed Ohaged Sample Status Client Info Changed Changed Ohaged Sample Status Client Info Changed Ohaged Ohaged Vater WC Method >3.0 <1.0 <1.0 Wear WC Method >0.2 NEG NEG Ohaged Wear WC Method >0.2 NEG NEG Ohaged Wear WC Method >2.0 <1 <-1 Ohaged Iron ppm ASTM D5185m >2 <1 <1 Ohaged		GAL)	-	0ct2023	Jan2024		
Sample Date Client Info 11 Jan 2024 23 Oct 2023 Machine Age hrs Client Info 0 2949 Oil Age hrs Client Info 600 600 Oil Changed Client Info Changed Changed Sample Status Imit/base current history1 history1 Fuel WC Method >0.2 NEG NEG Water WC Method >0.2 NEG NEG WEAR METALS method imit/base current history1 history2 Iron ppm ASTM 05185m >20 <1 Nickel ppm ASTM 05185m >2 <1 Silver ppm ASTM 05185m >2 <1 Auminum ppm ASTM 05185m >2 <1 Silver ppm	SAMPLE INFOR	MATION	method	limit/base	current	history1	history2
Machine Age hrs Client Info 0 2949 Oil Age hrs Client Info 600 600 Oil Changed Client Info 600 Changed Sample Status Imit/base current NoRMAL NoRMAL Valer WC Method >3.0 <1.0	Sample Number		Client Info		GFL0096869	GFL0091696	
Oil Age hrs Client Info 600 600 Oil Changed Client Info Changed Changed Sample Status Imil/base current history1 history1 Fuel WC Method >3.0 <1.0	Sample Date		Client Info		11 Jan 2024	23 Oct 2023	
Oil Changed Sample Status Client Info Changed NORMAL Changed NORMAL	Machine Age	hrs	Client Info		0	2949	
Sample Status NORMAL NORMAL NORMAL CONTAMINATION method limit/base current history1 history1 Fuel WC Method >3.0 <1.0	Oil Age	hrs	Client Info		600	600	
CONTAMINATION method limit/base current history1 history2 Fuel WC Method >3.0 <1.0	Oil Changed		Client Info		Changed	Changed	
Fuel WC Method >3.0 <1.0 <1.0 Water WC Method >0.2 NEG NEG Glycol WC Method NEG NEG WEAR METALS method limit/base current history1 history1 Iron ppm ASTM D5185m >20 <1	Sample Status				NORMAL	NORMAL	
Water WC Method >0.2 NEG NEG Glycol WC Method Imil/base current history1 history1 Iron ppm ASTM D5185m >90 15 19 Chromium ppm ASTM D5185m >20 <1	CONTAMINAT	ION	method	limit/base	current	history1	history2
Glycol WC Method NEG NEG WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >20 <1	Fuel		WC Method	>3.0	<1.0	<1.0	
WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >90 15 19 Chromium ppm ASTM D5185m >20 <1	Water		WC Method	>0.2	NEG	NEG	
Iron ppm ASTM D5185m >900 15 19	Glycol		WC Method		NEG	NEG	
Chromium ppm ASTM D5185m >20 <1 <1 Nickel ppm ASTM D5185m >2 <1	WEAR METAL	.S	method	limit/base	current	history1	history2
Nickel ppm ASTM D5185m >2 <1 0 Titanium ppm ASTM D5185m >2 <1	Iron	ppm	ASTM D5185m	>90	15	19	
Nickel ppm ASTM D5185m >2 <1 0 Titanium ppm ASTM D5185m >2 <1	Chromium		ASTM D5185m	>20	<1	<1	
Titanium ppm ASTM D5185m >2 <1 <1 Silver ppm ASTM D5185m >2 0 0 Aluminum ppm ASTM D5185m >20 2 7 Lead ppm ASTM D5185m >330 <1	Nickel	ppm		>2	<1	0	
Silver ppm ASTM D5185m >2 0 0 Aluminum ppm ASTM D5185m >20 2 7 Lead ppm ASTM D5185m >40 <1	Titanium		ASTM D5185m	>2	<1	<1	
Lead ppm ASTM D5185m >40 <1 0 Copper ppm ASTM D5185m >330 <1	Silver	ppm	ASTM D5185m	>2	0	0	
Copper ppm ASTM D5185m >330 <1 0 Tin ppm ASTM D5185m >15 <1	Aluminum		ASTM D5185m	>20	2	7	
Copper ppm ASTM D5185m >330 <1 0 Tin ppm ASTM D5185m >15 <1	Lead	ppm	ASTM D5185m	>40	<1	0	
Tin ppm ASTM D5185m >15 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1	Copper		ASTM D5185m	>330	<1	0	
Vanadium ppm ASTM D5185m 0 0 Cadmium ppm ASTM D5185m 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 0 4 Barium ppm ASTM D5185m 0 0 0 4 Manganese ppm ASTM D5185m 0 0 0 Magnesium ppm ASTM D5185m 0 0 0 Magnesium ppm ASTM D5185m 1010 926 901 Calcium ppm ASTM D5185m 1070 1062 1022 Galcium ppm ASTM D5185m 1270 1201 1205 Sulfur ppm ASTM D5185m 226 2 3 Solium ppm ASTM D5185m >20 7			ASTM D5185m	>15	<1	<1	
Cadmium ppm ASTM D5185m 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 0 4 Barium ppm ASTM D5185m 0 0 0 4 Manganese ppm ASTM D5185m 0 0 0 Magnesium ppm ASTM D5185m 010 926 901 Calcium ppm ASTM D5185m 1010 926 901 Calcium ppm ASTM D5185m 1070 1062 1022 Calcium ppm ASTM D5185m 1270 1201 1205 Sulfur ppm ASTM D5185m 2060 3069 2684 Sulfur ppm ASTM D5185m >20 7 18 Sodium ppm ASTM	Vanadium		ASTM D5185m		0	0	
Boron ppm ASTM D5185m 0 0 4 Barium ppm ASTM D5185m 0 0 0 0 0 Molybdenum ppm ASTM D5185m 60 59 57 0 Manganese ppm ASTM D5185m 0 0 <<1	Cadmium		ASTM D5185m		0	0	
Barium ppm ASTM D5185m 0 0 0 0	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum ppm ASTM D5185m 60 59 57 Manganese ppm ASTM D5185m 0 0 <1	Boron	ppm	ASTM D5185m	0	0	4	
Marganese ppm ASTM D5185m 0 0 <1 Magnesium ppm ASTM D5185m 1010 926 901 Calcium ppm ASTM D5185m 1070 1062 1022 Phosphorus ppm ASTM D5185m 1150 909 986 Zinc ppm ASTM D5185m 1270 1201 1205 Sulfur ppm ASTM D5185m 2060 3069 2684 Solfur ppm ASTM D5185m 2060 3069 2684 Solicon ppm ASTM D5185m 225 2 3 Sodium ppm ASTM D5185m >20 7 18 Potassium ppm ASTM D5185m >20 7 18 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 </td <td>Barium</td> <td>ppm</td> <td>ASTM D5185m</td> <td>0</td> <th>0</th> <td>0</td> <td></td>	Barium	ppm	ASTM D5185m	0	0	0	
Magnesium ppm ASTM D5185m 1010 926 901 Calcium ppm ASTM D5185m 1070 1062 1022 Phosphorus ppm ASTM D5185m 1150 909 9866 Zinc ppm ASTM D5185m 1270 1201 1205 Sulfur ppm ASTM D5185m 2060 3069 2684 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 2 3 Sodium ppm ASTM D5185m >20 7 18 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >6 0.6 0.7 Nitration Abs/cm *ASTM D7415 >30 20.0 21.5 FLUID DEGRADATION method	Molybdenum	ppm	ASTM D5185m	60	59	57	
Calcium ppm ASTM D5185m 1070 1062 1022 Phosphorus ppm ASTM D5185m 1150 909 986 Zinc ppm ASTM D5185m 1270 1201 1205 Sulfur ppm ASTM D5185m 2060 3069 2684 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 2 3 Sodium ppm ASTM D5185m >25 2 3 Potassium ppm ASTM D5185m >20 7 18 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7624 >20 9.0 10.6 Nitration Abs/.m *ASTM D7414 >20 9.0 10.6 Sulfation Abs/.1mm *ASTM D7415<	Manganese	ppm	ASTM D5185m	0	0	<1	
Phosphorus ppm ASTM D5185m 1150 909 986 Zinc ppm ASTM D5185m 1270 1201 1205 Sulfur ppm ASTM D5185m 2060 3069 2684 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 2 3 Sodium ppm ASTM D5185m >25 2 3 Potassium ppm ASTM D5185m >20 7 18 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7624 >20 9.0 10.6 Nitration Abs/cm *ASTM D744 >20 9.0 10.6 Sulfation Abs/.1mm *ASTM D7415 >30 20.0 21.5 FLUID DEGRADATION method l	Magnesium	ppm	ASTM D5185m	1010	926	901	
Zinc ppm ASTM D5185m 1270 1201 1205 Sulfur ppm ASTM D5185m 2060 3069 2684 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 2 3 Sodium ppm ASTM D5185m >25 2 3 Sodium ppm ASTM D5185m >20 7 18	Calcium	ppm	ASTM D5185m	1070	1062	1022	
Sulfur ppm ASTM D5185m 2060 3069 2684 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 2 3 5 Sodium ppm ASTM D5185m >25 2 3 7 18 7 18 7 18 7 18 7 18 7 18 7 18 7 18 7 18 7 18 7 18 7 18 7 18 7 18 7 18 7 18 7 18 7 18 7 18 18 10	Phosphorus	ppm	ASTM D5185m	1150	909	986	
CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 2 3 5 Sodium ppm ASTM D5185m >25 2 3 5 Potassium ppm ASTM D5185m >20 7 18 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >6 0.6 0.7 Nitration Abs/cm *ASTM D7624 >20 9.0 10.6 Sulfation Abs/.tmm *ASTM D7415 >30 20.0 21.5 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.tmm *ASTM D7414 >25 16.8 18.6	Zinc	ppm	ASTM D5185m	1270	1201	1205	
Silicon ppm ASTM D5185m >25 2 3 Sodium ppm ASTM D5185m Co 0 5 5 Potassium ppm ASTM D5185m >20 7 18 7 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >6 0.6 0.7 7 Nitration Abs/cm *ASTM D7624 >20 9.0 10.6 Sulfation Abs/.1mm *ASTM D7624 >20 9.0 10.6 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 16.8 18.6	Sulfur	ppm	ASTM D5185m	2060	3069	2684	
Sodium ppm ASTM D5185m 0 5 Potassium ppm ASTM D5185m >20 7 18 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >6 0.6 0.7 Nitration Abs/cm *ASTM D7624 >20 9.0 10.6 Sulfation Abs/.1mm *ASTM D7415 >30 20.0 21.5 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 16.8 18.6	CONTAMINAN	ITS	method	limit/base	current	history1	history2
Potassium ppm ASTM D5185m >20 7 18 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >6 0.6 0.7 Nitration Abs/cm *ASTM D7624 >20 9.0 10.6 Sulfation Abs/.1mm *ASTM D7415 >30 20.0 21.5 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 16.8 18.6		ppm	ASTM D5185m	>25	2		
INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >6 0.6 0.7 Nitration Abs/cm *ASTM D7624 >20 9.0 10.6 Sulfation Abs/.1mm *ASTM D7415 >30 20.0 21.5 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 16.8 18.6	Sodium	ppm	ASTM D5185m		0	5	
Soot % % *ASTM D7844 >6 0.6 0.7 Nitration Abs/cm *ASTM D7624 >20 9.0 10.6 Sulfation Abs/.1mm *ASTM D7415 >30 20.0 21.5 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 16.8 18.6	Potassium	ppm	ASTM D5185m	>20	7	18	
Nitration Abs/cm *ASTM D7624 >20 9.0 10.6 Sulfation Abs/.1mm *ASTM D7415 >30 20.0 21.5 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 16.8 18.6	INFRA-RED		method	limit/base	current	history1	history2
Sulfation Abs/.1mm *ASTM D7415 >30 20.0 21.5 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 16.8 18.6	Soot %	%	*ASTM D7844	>6	0.6	0.7	
FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 16.8 18.6	Nitration	Abs/cm	*ASTM D7624	>20	9.0	10.6	
Oxidation Abs/.1mm *ASTM D7414 >25 16.8 18.6	Sulfation	Abs/.1mm	*ASTM D7415	>30	20.0	21.5	
	FLUID DEGRA	DATION	method	limit/base	current	history1	history2
Base Number (BN) mg KOH/g ASTM D2896 9.8 8.4 7.9	Oxidation	Abs/.1mm	*ASTM D7414	>25	16.8	18.6	
	Base Number (BN)		ASTM D2896	9.8	8.4	7.9	

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.

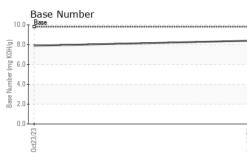
Fluid Condition

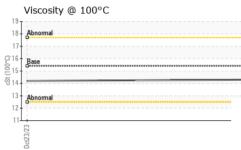
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.



OIL ANALYSIS REPORT

VISUAL





	White Motel					NONE	
	White Metal	scalar	*Visual	NONE	NONE	NONE	
	Yellow Metal	scalar	*Visual	NONE	NONE	NONE	
	Precipitate	scalar	*Visual	NONE	NONE	NONE	
	Silt	scalar	*Visual	NONE	NONE	NONE	
	Debris	scalar	*Visual	NONE	NONE	NONE	
	Sand/Dirt	scalar	*Visual	NONE	NONE	NONE	
-	Appearance	scalar	*Visual	NORML	NORML	NORML	
	Odor	scalar	*Visual	NORML	NORML	NORML	
	Emulsified Water	scalar	*Visual	>0.2	NEG	NEG	
	Free Water	scalar	*Visual	20.L	NEG	NEG	
				11 - 11/1			
	FLUID PROP		method	limit/base	current	history1	history
	Visc @ 100°C	cSt	ASTM D445	15.4	14.3	14.2	
	GRAPHS						
	Ferrous Alloys						
	iron		-				
	15 - nickel						
	톨 10						
	5 -						
				4			
	0ct23/23			Jan 1 1/2 4			
	_			Ja			
	Non-ferrous Me	tals					
	copper						
	8 - lead						
	sessesses tin						
	c line						
	6						
	6 4						
	6						
	6						
				11/24			
	6			Jan11/24			
	Viscosity @ 100	°C		Jan11/24	Base Number	r	
	Viscosity @ 100	°C		471 Juer 10.0	Base Number	r	
	Viscosity @ 100	°C		10.0	Base	r	
	Viscosity @ 100	°C		10.0	Base	r	
	Viscosity @ 100	°C		10.0		r	
	Viscosity @ 100	°C		10.0	Base	r	
	Viscosity @ 100	°C		10.0	Base	r	
	Viscosity @ 100	•C		0.0 0.8 0.0 0.0 0.0 0.0 0.0	Base.	r	
	Viscosity @ 100	°C		10.0 8.0 (0)(HO) uu X0(HQ) ase ymmy 4.0	Base.	r	
	Viscosity @ 100	°C		10.0 (0)HOX Bun Jaquing 4.0 2.0 0.0	Base	r	
	Viscosity @ 100	°C		10.0 (0)HOX Bun Jaquing 4.0 2.0 0.0	Base	r	
	Viscosity @ 100	°C		10.0 (0)HOX BOUL Participant (0)HOX BOUL (0)HOX BOUL Participant (0)HOX BOUL (0)HOX BOUL (Base	r	
	Viscosity @ 100			10.0 (0,8.0 (0,H(0) Base Number (und KOH(0) 2.0 4.0 0.0	E2022200		
	Viscosity @ 100	- 501 Madia		10.0 (0)HOX BOU) Jaquing area (0)HOX BOU) Jaquing area (0,0) (0)HOX BOU) Jaquing area (0,0) (0,0	E2022200	rironmental - 401 - F	
	Viscosity @ 100	- 501 Madia	d : 30 .	10.0 (0,8.0 (0,H(0) Base Number (und KOH(0) 2.0 4.0 0.0	E2022200	rironmental - 401 - F 4429 ALLI	EN MARTIN
	Viscosity @ 100	- 501 Madia	d : 30 ed : 31	10.0 (0)H00 Bull Jaquing Verse 2.0 +2/11 Lung ry, NC 27513 Jan 2024	E2022200	rironmental - 401 - F 4429 ALLI	Fort Wayne Hau EN MARTIN DRT WAYNE US 468
	Viscosity @ 100 Viscosity @ 100	- 501 Madia Recieved Diagnose	d : 30 ed : 31	10.0 (0)H00 Bull Jaquing View 2.0 +2/11 Ling 10.0 10.0 10.0 10.0 10.0 10.0 10.0 10.	E2022200	rironmental - 401 - F 4429 ALLI FC	EN MARTIN ORT WAYNE



To discuss this sample * - 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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