

OIL ANALYSIS REPORT

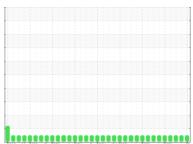
Sample Rating Trend

NORMAL

(YA154303) 2844

Component Diesel Engine Fluid

PETRO CANADA DURON SHP 15W40 (10 GAL)





Sample Number Client Info GFL0098711 GFL0087760 GFL0087760 GFL0087760 Sample Date Istan 1nfo 15 Jan 2024 28 Sep 2023 17 Jul 2023 Machine Age hrs Client Info 14082 13280 12705 Oil Age hrs Client Info 14082 575 520 Oil Changed Client Info Changed Changed Changed Changed Sample Status Imitbase Current History1 History2 Fuel WC Method >0.0 <1.0 <1.0 <1.0 Water WC Method >0.2 NEG NEG NEG Glycol WC Method NEG NEG NEG NEG Vetar MCM MSIM 05185m >5 1 1 1 Nickel ppm ASTM 05185m >2 0 0 0 Corronium ppm ASTM 05185m >2 0 0 0 Silver ppm	SAMPLE INFOF	RMATION	method	limit/base	current	history1	history2
Sample Date Client Info 15 Jan 2024 28 Sep 2023 17 Jul 2023 Machine Age hrs Client Info 14082 13280 12705 Oil Age hrs Client Info 802 575 520 Oil Changed Client Info Changed NORMAL NORMAL NORMAL CONTAMINATION method imit/base current History1 history2 Fuel WC Method >3.0 <1.0	Sample Number		Client Info		GFL0098511	GFL0087760	GFL0087798
Machine Age hrs Client Info 14082 13280 12705 Oil Age hrs Client Info 802 575 520 Oil Changed Client Info 002 575 520 Sample Status n NORMAL							
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CONTAMINATION method limit/base current history1 history2 Fuel WC Method >3.0 <1.0	•				-		
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Water WC Method >0.2 NEG NEG NEG NEG Glycol WC Method NEG NEG NEG NEG WEAR METALS method limit/base current history1 history2 Iron ppm ASTM 05185m >5 1 1 1 Nickel ppm ASTM 05185m >5 0 0 0 Silver ppm ASTM 05185m >5 0 0 0 Aluminum ppm ASTM 05185m >5 0 0 0 Copper ppm ASTM 05185m >180 2 1 <1		ION					
Glycol WC Method NEG NEG NEG WEAR METALS method limit/base current history1 history2 Iron ppm ASTM 05185m >5 1 1 1 Nickel ppm ASTM 05185m >5 0 0 0 Silver ppm ASTM 05185m >5 0 0 0 Aluminum ppm ASTM 05185m >2 0 0 0 Lead ppm ASTM 05185m >180 2 1 <1							
WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >65 12 10 9 Chromium ppm ASTM D5185m >5 1 1 1 Nickel ppm ASTM D5185m >5 0 0 0 Titanium ppm ASTM D5185m >2 0 0 0 Aluminum ppm ASTM D5185m >2 0 0 0 Lead ppm ASTM D5185m >160 2 1 <1				>0.2			
Iron ppm ASTM D5185m >665 12 10 9 Chromium ppm ASTM D5185m >5 1 1 1 Nickel ppm ASTM D5185m >3 0 <1	-		WC Method		NEG	NEG	NEG
Chromium ppm ASTM D5185m >5 1 1 1 Nickel ppm ASTM D5185m >3 0 <1	WEAR METAL	_S	method	limit/base	current	history1	history2
Nickel ppm ASTM D5185m >3 0 <1 0 Titanium ppm ASTM D5185m >5 0 0 0 Silver ppm ASTM D5185m >2 0 0 0 Aluminum ppm ASTM D5185m >35 6 7 11 Lead ppm ASTM D5185m >10 0 0 0 Copper ppm ASTM D5185m >180 2 1 <1	Iron	ppm	ASTM D5185m	>65	12	10	9
Titanium ppm ASTM D5185m >5 0 0 0 Silver ppm ASTM D5185m >2 0 0 0 Aluminum ppm ASTM D5185m >35 6 7 11 Lead ppm ASTM D5185m >10 0 0 0 Copper ppm ASTM D5185m >180 2 1 <1	Chromium	ppm	ASTM D5185m	>5	1	1	1
Silver ppm ASTM D5185m >2 0 0 0 Aluminum ppm ASTM D5185m >35 6 7 11 Lead ppm ASTM D5185m >10 0 0 0 Copper ppm ASTM D5185m >180 2 1 <1	Nickel	ppm	ASTM D5185m	>3	0	<1	0
Silver ppm ASTM D5185m >2 0 0 0 Aluminum ppm ASTM D5185m >35 6 7 11 Lead ppm ASTM D5185m >10 0 0 0 Copper ppm ASTM D5185m >180 2 1 <1	Titanium	ppm	ASTM D5185m	>5	0	0	0
Lead ppm ASTM D5185m >10 0 0 0 Copper ppm ASTM D5185m >180 2 1 <1	Silver	ppm	ASTM D5185m	>2	0	0	0
Lead ppm ASTM D5185m >10 0 0 0 Copper ppm ASTM D5185m >180 2 1 <1	Aluminum	ppm	ASTM D5185m	>35	6	7	11
Copper ppm ASTM D5185m >180 2 1 <1 Tin ppm ASTM D5185m >8 <1	Lead		ASTM D5185m	>10	0	0	0
Tin ppm ASTM D5185m >8 <1 <1 0 Vanadium ppm ASTM D5185m 0 0 0 0 Cadmium ppm ASTM D5185m 0 2 <1	Copper		ASTM D5185m	>180		1	<1
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Cadmium ppm ASTM D5185m 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 2 <1 5 Barium ppm ASTM D5185m 0 0 0 0 0 Molybdenum ppm ASTM D5185m 0 current history1 state of the state of	Vanadium		ASTM D5185m		<1	0	0
Boron ppm ASTM D5185m 0 2 <1 5 Barium ppm ASTM D5185m 0 0 0 0 0 Molybdenum ppm ASTM D5185m 60 61 61 58 Manganese ppm ASTM D5185m 0 <1							0
Barium ppm ASTM D5185m 0 0 0 0 Molybdenum ppm ASTM D5185m 60 61 61 58 Manganese ppm ASTM D5185m 0 <1 <1 <1 Magnesium ppm ASTM D5185m 1010 1010 938 901 Calcium ppm ASTM D5185m 1010 1010 938 901 Calcium ppm ASTM D5185m 1070 1166 1056 1152 Phosphorus ppm ASTM D5185m 1070 1324 1289 1268 Sulfur ppm ASTM D5185m 2060 3093 3122 3645 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >15 3 3 2 Sodium ppm ASTM D5185m >20 4 10 16 INFRA-RED method limit/base	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum ppm ASTM D5185m 60 61 61 58 Manganese ppm ASTM D5185m 0 <1	Boron	ppm	ASTM D5185m	0	2	<1	5
Manganese ppm ASTM D5185m 0 <1 <1 <1 Magnesium ppm ASTM D5185m 1010 1010 938 901 Calcium ppm ASTM D5185m 1070 1166 1056 1152 Phosphorus ppm ASTM D5185m 1070 1364 1040 1025 Zinc ppm ASTM D5185m 1270 1324 1289 1268 Sulfur ppm ASTM D5185m 2060 3093 3122 3645 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >15 3 3 2 Sodium ppm ASTM D5185m >20 4 10 16 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.3 0.3 0.3 0.3 Nitration Abs/.mm	Barium	ppm	ASTM D5185m	0	0	0	0
Magnesium ppm ASTM D5185m 1010 1010 938 901 Calcium ppm ASTM D5185m 1070 1166 1056 1152 Phosphorus ppm ASTM D5185m 1150 1063 1040 1025 Zinc ppm ASTM D5185m 1270 1324 1289 1268 Sulfur ppm ASTM D5185m 2060 3093 3122 3645 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >15 3 3 2 Sodium ppm ASTM D5185m >15 3 3 2 Sodium ppm ASTM D5185m >20 4 10 16 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7644 >3 0.3 0.3 0.3 Nitration Abs/.mm *ASTM D7415	Molybdenum	ppm	ASTM D5185m	60	61	61	58
Calcium ppm ASTM D5185m 1070 1166 1056 1152 Phosphorus ppm ASTM D5185m 1150 1063 1040 1025 Zinc ppm ASTM D5185m 1270 1324 1289 1268 Sulfur ppm ASTM D5185m 2060 3093 3122 3645 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >15 3 3 2 Sodium ppm ASTM D5185m >15 3 3 2 Sodium ppm ASTM D5185m >20 4 10 16 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7624 >20 7.7 7.1 7.0 Sulfation Abs/.mm *ASTM D7614 >30 18.7 18.9 18.7 FLUID DEGRADATION method limit/	Manganese	ppm	ASTM D5185m	0	<1	<1	<1
Phosphorus ppm ASTM D5185m 1150 1063 1040 1025 Zinc ppm ASTM D5185m 1270 1324 1289 1268 Sulfur ppm ASTM D5185m 2060 3093 3122 3645 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >15 3 3 2 Sodium ppm ASTM D5185m >15 3 3 2 Sodium ppm ASTM D5185m >15 3 3 2 Sodium ppm ASTM D5185m >20 4 10 16 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.3 0.3 0.3 0.3 Nitration Abs/cm *ASTM D7624 >20 7.7 7.1 7.0 Sulfation Abs/.1mm *ASTM D	Magnesium	ppm	ASTM D5185m	1010	1010	938	901
Zinc ppm ASTM D5185m 1270 1324 1289 1268 Sulfur ppm ASTM D5185m 2060 3093 3122 3645 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >15 3 3 2 2 Sodium ppm ASTM D5185m >15 3 3 2 2 Sodium ppm ASTM D5185m >15 3 3 2<	Calcium	ppm	ASTM D5185m	1070	1166	1056	1152
Zinc ppm ASTM D5185m 1270 1324 1289 1268 Sulfur ppm ASTM D5185m 2060 3093 3122 3645 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >15 3 3 2 2 Sodium ppm ASTM D5185m >15 3 3 2 2 Sodium ppm ASTM D5185m >15 3 3 2<	Phosphorus	ppm	ASTM D5185m	1150	1063	1040	1025
CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >15 3 3 2 Sodium ppm ASTM D5185m >15 3 3 2 Sodium ppm ASTM D5185m >15 3 3 2 Potassium ppm ASTM D5185m >20 4 10 16 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.3 0.3 0.3 Nitration Abs/cm *ASTM D7624 >20 7.7 7.1 7.0 Sulfation Abs/.tmm *ASTM D7415 >30 18.7 18.9 18.7 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.tmm *ASTM D7414 >25 15.3 14.6 14.3		ppm	ASTM D5185m	1270	1324	1289	1268
Silicon ppm ASTM D5185m >15 3 3 2 Sodium ppm ASTM D5185m <15 3 3 2 Sodium ppm ASTM D5185m >15 3 3 2 Potassium ppm ASTM D5185m >20 4 10 16 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7624 >3 0.3 0.3 0.3 Nitration Abs/cm *ASTM D7624 >20 7.7 7.1 7.0 Sulfation Abs/.1mm *ASTM D7415 >30 18.7 18.9 18.7 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 15.3 14.6 14.3	Sulfur	ppm	ASTM D5185m	2060	3093	3122	3645
Sodium ppm ASTM D5185m <1 <1 1 Potassium ppm ASTM D5185m >20 4 10 16 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.3 0.3 0.3 Nitration Abs/cm *ASTM D7624 >20 7.7 7.1 7.0 Sulfation Abs/.1mm *ASTM D7415 >30 18.7 18.9 18.7 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 15.3 14.6 14.3	CONTAMINAN	NTS	method	limit/base	current	history1	history2
Potassium ppm ASTM D5185m >20 4 10 16 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.3 0.3 0.3 Nitration Abs/cm *ASTM D7624 >20 7.7 7.1 7.0 Sulfation Abs/.1mm *ASTM D7415 >30 18.7 18.9 18.7 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 15.3 14.6 14.3	Silicon	ppm	ASTM D5185m	>15	3	3	2
INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.3 0.3 0.3 Nitration Abs/cm *ASTM D7624 >20 7.7 7.1 7.0 Sulfation Abs/.1mm *ASTM D7415 >30 18.7 18.9 18.7 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 15.3 14.6 14.3	Sodium	ppm	ASTM D5185m		<1	<1	1
Soot % % *ASTM D7844 >3 0.3 0.3 0.3 Nitration Abs/cm *ASTM D7624 >20 7.7 7.1 7.0 Sulfation Abs/.1mm *ASTM D7415 >30 18.7 18.9 18.7 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 15.3 14.6 14.3	Potassium	ppm	ASTM D5185m	>20	4	10	16
Nitration Abs/cm *ASTM D7624 >20 7.7 7.1 7.0 Sulfation Abs/.1mm *ASTM D7415 >30 18.7 18.9 18.7 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 15.3 14.6 14.3	INFRA-RED		method	limit/base	current	history1	history2
Sulfation Abs/.1mm *ASTM D7415 >30 18.7 18.9 18.7 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 15.3 14.6 14.3	Soot %	%	*ASTM D7844	>3	0.3	0.3	0.3
Sulfation Abs/.1mm *ASTM D7415 >30 18.7 18.9 18.7 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 15.3 14.6 14.3	Nitration	Abs/cm	*ASTM D7624	>20	7.7	7.1	7.0
Oxidation Abs/.1mm *ASTM D7414 >25 15.3 14.6 14.3	Sulfation	Abs/.1mm	*ASTM D7415	>30		18.9	18.7
	FLUID DEGRA	DATION	method	limit/base	current	history1	history2
Base Number (BN) mg KOH/g ASTM D2896 9.8 8.1 8.4 8.7	Oxidation	Abs/.1mm	*ASTM D7414	>25	15.3	14.6	14.3
	Base Number (BN)	mg KOH/g	ASTM D2896	9.8	8.1	8.4	8.7

Recommendation

DIAGNOSIS

Resample at the next service interval to monitor.

Wear

All component wear rates are normal.

Contamination

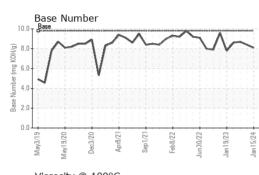
There is no indication of any contamination in the oil.

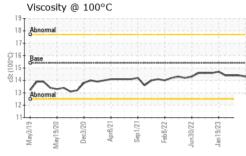
Fluid Condition

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

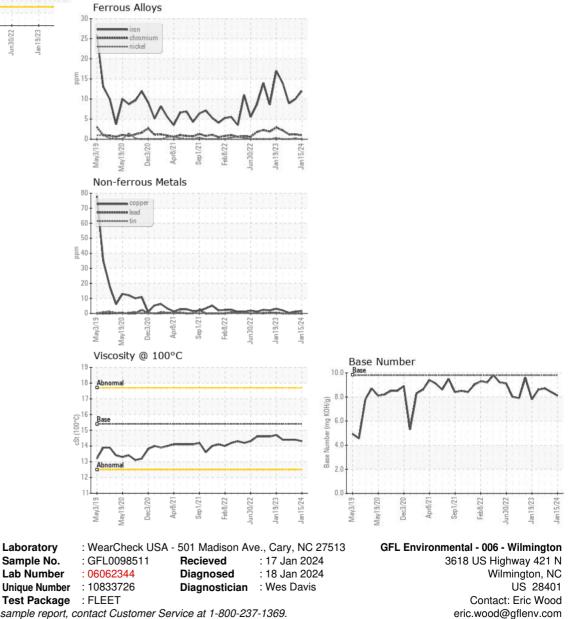


OIL ANALYSIS REPORT





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 PROPE	RTIES	method	limit/base	current	history1	history2
Visc @ 100°C	cSt	ASTM D445	15.4	14.3	14.4	14.4
GRAPHS						





Statements of conformity to specifications are based on the simple acceptance decision rule (JCGM 106:2012)

Certificate L2367

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