

OIL ANALYSIS REPORT

Sample Rating Trend

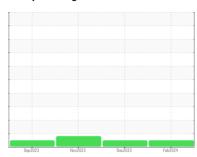
NORMAL



(BA61092)
Machine Id
4571M
Component

Diesel Engine

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





DIAGNOSIS

Recommendation

Resample at the next service interval to monitor.

Moor

All component wear rates are normal.

Contamination

There is no indication of any contamination in the oil

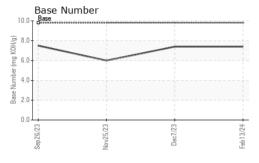
Fluid Condition

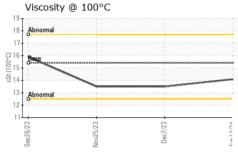
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

Sample Date			Sep202	3 Nov2023	Dec2023 Fe	b2024	
Sample Date	SAMPLE INFO	PRMATION	method	limit/base	current	history1	history2
Machine Age hrs Client Info 23230 22810 43553 Oil Age hrs Client Info 23230 22810 43553 Oil Age hrs Client Info Not Changed Not Changed Not Changed Not Changed NoRMAL NORMAL ABNORMAL CONTAMINATION method Imit/base current history1 history2	Sample Number		Client Info		GFL0110114	GFL0059295	GFL0059276
Oil Age hrs Client Info 23230 22810 43553 Oil Changed Sample Status Client Info Not Changd NoRMAL NoRMAL ABNORMAL CONTAMINATION method limit base current history1 history2 Fuel WC Method >3.0 <1.0 <1.0 <1.0 Water WC Method >0.2 NEG NEG NEG Glycol WC Method NEG NEG NEG WEAR METALS method limit base current history1 history2 Iron ppm ASTM D5185m >75 14 40 26 Chromium ppm ASTM D5185m >4 0 0 6 Nickel ppm ASTM D5185m >2 <1 0 <1 Silver ppm ASTM D5185m >2 <1 0 <1 Lead ppm ASTM D5185m >25 0 <1 0 Copper pp	Sample Date		Client Info		13 Feb 2024	07 Dec 2023	25 Nov 2023
Oil Age hrs Client Info 23230 22810 43553 Oil Changed Sample Status Client Info Not Changd NoRMAL Not Changd NoRMAL Not Changd Sample Status Not Changd NoRMAL Not Changd NoRMAL ABNORMAL ABNORMAL CONTAMINATION method limit base current history1 history2 Fuel WC Method >3.0 <1.0	Machine Age	hrs	Client Info		23230	22810	43553
Oil Changed Sample Status Client Info Not Changed NORMAL Changed NORMAL Not Changed ABNORMAL Not Changed ABNORMAL Not Changed ABNORMAL NoRMAL ABNORMAL ALIO 4.1.0 <		hrs	Client Info		23230	22810	43553
NORMAL NORMAL ABNORMAL	•		Client Info		Not Changd	Changed	Not Changd
Fuel							ABNORMAL
Water WC Method >0.2 NEG NEG NEG Glycol WC Method Imitibase current history1 history2 WEAR METALS method limitibase current history1 history2 Iron ppm ASTM D5185m >5 <1	CONTAMINA	ATION	method	limit/base	current	history1	history2
WEAR METALS	Fuel		WC Method	>3.0	<1.0	<1.0	<1.0
WEAR METALS	Water		WC Method	>0.2	NEG	NEG	NEG
Irron	Glycol		WC Method		NEG	NEG	NEG
Chromium ppm ASTM D5185m >5 <1	WEAR META	ALS	method	limit/base	current	history1	history2
Chromium ppm ASTM D5185m >5 <1 2 1 Nickel ppm ASTM D5185m >4 0 0 ▲ 6 Titanium ppm ASTM D5185m >2 <1	Iron	mag	ASTM D5185m	>75	14	40	26
Nickel ppm ASTM D5185m >4 0 △ 6 Titanium ppm ASTM D5185m >2 <1							
Titanium							
Silver ppm ASTM D5185m >2 0 0 0 Aluminum ppm ASTM D5185m >15 2 3 1 Lead ppm ASTM D5185m >25 0 <1 0 Copper ppm ASTM D5185m >100 <1 3 15 Tin ppm ASTM D5185m 0 0 0 <1 Vanadium ppm ASTM D5185m 0 0 0 <1 Cadmium ppm ASTM D5185m 0 0 0 <1 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 3 <1 2 Barium ppm ASTM D5185m 0 0 0 0 Molydenum ppm ASTM D5185m 0 0 0 0 Manganesium ppm ASTM D5185m 1010 907 948 <t< td=""><td></td><td></td><td></td><td></td><th></th><td></td><td></td></t<>							
Aluminum ppm ASTM D5185m >15 2 3 1 Lead ppm ASTM D5185m >25 0 <1							
Lead ppm ASTM D5185m >25 0 <1 0 Copper ppm ASTM D5185m >100 <1 3 15 Tin ppm ASTM D5185m >4 <1 0 2 Vanadium ppm ASTM D5185m 0 0 0 <1 Cadmium ppm ASTM D5185m 0 0 0 <1 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 3 <1 2 Barium ppm ASTM D5185m 0 0 0 0 Molybdenum ppm ASTM D5185m 0 <1 <1 <1 Manganese ppm ASTM D5185m 0 <1 <1 <1 <1 Magnesium ppm ASTM D5185m 0 <1 <1 <1 <1 Calcium ppm ASTM D5185m 100							
Copper ppm ASTM D5185m >100 <1 3 15 Tin ppm ASTM D5185m >4 <1							
Tin		- ' '			-		
Vanadium ppm ASTM D5185m 0 0 <1 Cadmium ppm ASTM D5185m 0 0 0 <1 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 3 <1 2 Barium ppm ASTM D5185m 0 0 0 0 Molybdenum ppm ASTM D5185m 0 54 53 59 Manganese ppm ASTM D5185m 0 <1 <1 <1 Magnesium ppm ASTM D5185m 1010 907 948 878 Calcium ppm ASTM D5185m 1070 997 1026 1078 Phosphorus ppm ASTM D5185m 1150 1012 1001 910 Zinc ppm ASTM D5185m 1270 1219 1196 1120 Sulfur ppm ASTM D5185m 2060 3000	• •						
Cadmium ppm ASTM D5185m 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 3 <1				>4			
ADDITIVES		ppm					
Boron	Cadmium	ppm	ASTM D5185m		0	0	0
Barium ppm ASTM D5185m 0 0 0 0 Molybdenum ppm ASTM D5185m 60 54 53 59 Manganese ppm ASTM D5185m 0 <1 <1 <1 Magnesium ppm ASTM D5185m 1010 907 948 878 Calcium ppm ASTM D5185m 1070 997 1026 1078 Phosphorus ppm ASTM D5185m 1070 997 1026 1078 Phosphorus ppm ASTM D5185m 1270 1219 1196 1120 Zinc ppm ASTM D5185m 2060 3000 2738 2124 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 4 7 6 Sodium ppm ASTM D5185m >20 1 <1 0 INFRA-RED method limit/b	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum ppm ASTM D5185m 60 54 53 59 Manganese ppm ASTM D5185m 0 <1 <1 <1 Magnesium ppm ASTM D5185m 1010 907 948 878 Calcium ppm ASTM D5185m 1070 997 1026 1078 Phosphorus ppm ASTM D5185m 1150 1012 1001 910 Zinc ppm ASTM D5185m 1270 1219 1196 1120 Sulfur ppm ASTM D5185m 2060 3000 2738 2124 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m 22 38 6 Potassium ppm ASTM D5185m 20 1 <1 0 INFRA-RED method limit/base current history1 history2 Soot % *ASTM D7844 >6 0.3	Boron	ppm					
Manganese ppm ASTM D5185m 0 <1 <1 <1 Magnesium ppm ASTM D5185m 1010 907 948 878 Calcium ppm ASTM D5185m 1070 997 1026 1078 Phosphorus ppm ASTM D5185m 1150 1012 1001 910 Zinc ppm ASTM D5185m 1270 1219 1196 1120 Sulfur ppm ASTM D5185m 2060 3000 2738 2124 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 4 7 6 Sodium ppm ASTM D5185m >20 1 <1 0 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >6 0.3 1 0.9 Nitration Abs/cm *ASTM D7845	Barium	ppm	ASTM D5185m	0	0	0	0
Magnesium ppm ASTM D5185m 1010 907 948 878 Calcium ppm ASTM D5185m 1070 997 1026 1078 Phosphorus ppm ASTM D5185m 1150 1012 1001 910 Zinc ppm ASTM D5185m 1270 1219 1196 1120 Sulfur ppm ASTM D5185m 2060 3000 2738 2124 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m 25 4 7 6 Sodium ppm ASTM D5185m 20 1 <1 0 INFRA-RED method limit/base current history1 history2 Soot % *ASTM D7844 >6 0.3 1 0.9 Nitration Abs/cm *ASTM D7415 >20 6.2 13.5 9.3 Sulfation Abs/.1mm *ASTM D7415 >25	Molybdenum	ppm			54	53	59
Calcium ppm ASTM D5185m 1070 997 1026 1078 Phosphorus ppm ASTM D5185m 1150 1012 1001 910 Zinc ppm ASTM D5185m 1270 1219 1196 1120 Sulfur ppm ASTM D5185m 2060 3000 2738 2124 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 4 7 6 Sodium ppm ASTM D5185m 2 38 6 Potassium ppm ASTM D5185m >20 1 <1	Manganese	ppm	ASTM D5185m	0	<1	<1	<1
Phosphorus ppm ASTM D5185m 1150 1012 1001 910 Zinc ppm ASTM D5185m 1270 1219 1196 1120 Sulfur ppm ASTM D5185m 2060 3000 2738 2124 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 4 7 6 Sodium ppm ASTM D5185m 2 38 6 Potassium ppm ASTM D5185m >20 1 <1 0 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >6 0.3 1 0.9 Nitration Abs/cm *ASTM D7624 >20 6.2 13.5 9.3 Sulfation Abs/.1mm *ASTM D7415 >30 18.2 24.8 22.6 FLUID DEGRADATION *ASTM D7414 >25 <th< td=""><td>Magnesium</td><td>ppm</td><td>ASTM D5185m</td><td>1010</td><th>907</th><td>948</td><td>878</td></th<>	Magnesium	ppm	ASTM D5185m	1010	907	948	878
Zinc ppm ASTM D5185m 1270 1219 1196 1120 Sulfur ppm ASTM D5185m 2060 3000 2738 2124 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 4 7 6 Sodium ppm ASTM D5185m 2 38 6 Potassium ppm ASTM D5185m >20 1 <1	Calcium	ppm	ASTM D5185m	1070	997	1026	1078
Sulfur ppm ASTM D5185m 2060 3000 2738 2124 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 4 7 6 Sodium ppm ASTM D5185m 2 38 6 Potassium ppm ASTM D5185m >20 1 <1	Phosphorus	ppm	ASTM D5185m	1150	1012	1001	910
CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 4 7 6 Sodium ppm ASTM D5185m 2 38 6 Potassium ppm ASTM D5185m >20 1 <1	Zinc	ppm	ASTM D5185m	1270	1219	1196	1120
Silicon ppm ASTM D5185m >25 4 7 6 Sodium ppm ASTM D5185m 2 38 6 Potassium ppm ASTM D5185m >20 1 <1 0 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >6 0.3 1 0.9 Nitration Abs/cm *ASTM D7624 >20 6.2 13.5 9.3 Sulfation Abs/.1mm *ASTM D7415 >30 18.2 24.8 22.6 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 13.9 25.2 18.7	Sulfur	ppm	ASTM D5185m	2060	3000	2738	2124
Sodium ppm ASTM D5185m 2 38 6 Potassium ppm ASTM D5185m >20 1 <1	CONTAMINA	ANTS	method	limit/base	current	history1	history2
Potassium ppm ASTM D5185m >20 1 <1 0 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >6 0.3 1 0.9 Nitration Abs/cm *ASTM D7624 >20 6.2 13.5 9.3 Sulfation Abs/.1mm *ASTM D7415 >30 18.2 24.8 22.6 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 13.9 25.2 18.7	Silicon	ppm	ASTM D5185m	>25	4	7	6
INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >6 0.3 1 0.9 Nitration Abs/cm *ASTM D7624 >20 6.2 13.5 9.3 Sulfation Abs/.1mm *ASTM D7415 >30 18.2 24.8 22.6 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 13.9 25.2 18.7	Sodium	ppm	ASTM D5185m		2	38	6
Soot % % *ASTM D7844 >6 0.3 1 0.9 Nitration Abs/cm *ASTM D7624 >20 6.2 13.5 9.3 Sulfation Abs/.1mm *ASTM D7415 >30 18.2 24.8 22.6 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 13.9 25.2 18.7	Potassium	ppm	ASTM D5185m	>20	1	<1	0
Nitration Abs/cm *ASTM D7624 > 20 6.2 13.5 9.3 Sulfation Abs/.1mm *ASTM D7415 > 30 18.2 24.8 22.6 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 > 25 13.9 25.2 18.7	INFRA-RED		method	limit/base	current	history1	history2
Sulfation Abs/.1mm *ASTM D7415 >30 18.2 24.8 22.6 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 13.9 25.2 18.7	Soot %	%	*ASTM D7844	>6	0.3	1	0.9
Sulfation Abs/.1mm *ASTM D7415 >30 18.2 24.8 22.6 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 13.9 25.2 18.7	Nitration	Abs/cm	*ASTM D7624	>20	6.2	13.5	9.3
Oxidation Abs/.1mm *ASTM D7414 >25 13.9 25.2 18.7							
	FLUID DEGRADATION method limit/base current history1 history2						
	Oxidation	Abs/.1mm	*ASTM D7414	>25	13.9	25.2	18.7
	Base Number (BN				7.4	7.4	6.0



OIL ANALYSIS REPORT

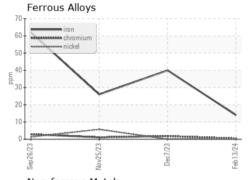


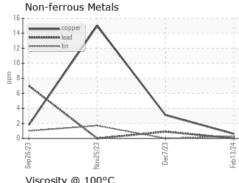


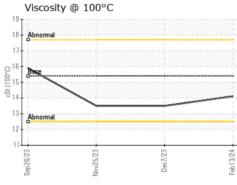
VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual	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

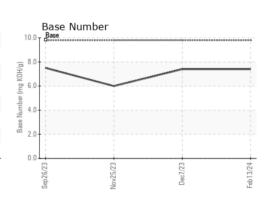
FLUID PROPERTIES		method				history2
Visc @ 100°C	cSt	ASTM D445	15.4	14.1	13.5	13.5

GRAPHS













Laboratory Sample No.

: GFL0110114 Lab Number : 06091528 Unique Number : 10884381 Test Package : FLEET

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 Received : 16 Feb 2024 **Tested** : 19 Feb 2024

Diagnosed : 19 Feb 2024 - Wes Davis

GFL Environmental - 410 - Michigan West 39000 Van Born Rd

Wayne, MI US 48184 Contact: Belal Dgheish

bdgheish@gflenv.com T: (734)714-2340

To discuss this sample report, contact Customer Service at 1-800-237-1369.

* - 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)