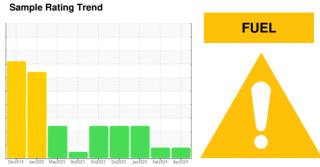


OIL ANALYSIS REPORT

(30KK8A) 722028-361658

Diesel Engine

PETRO CANADA DURON SHP 15W40 (8 GAL)



DIAGNOSIS

Recommendation

No corrective action is recommended at this time. Resample at the next service interval to monitor.

Wear

All component wear rates are normal.

Contamination

Light fuel dilution occurring. No other contaminants were detected in the oil.

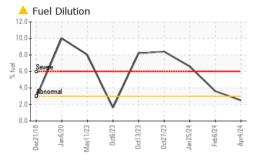
Fluid Condition

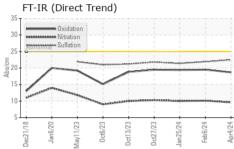
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

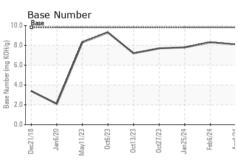
Sample Number Client Info GFL0104842 GFL0104893 GFL0104895 GFL0104895	AL)		Dec2010 Jai	12020 MBy2023 0012023	Oct2023 Oct2023 Jan 2024 Feb 20	24 Api2024	
Sample Date	SAMPLE INFOR	RMATION	method	limit/base	current	history1	history2
Machine Age hrs Client Info 19820 18700 18881 1297 18700 18681 1297 18700 18681 1297 18700 18681 1297 18700 18681 1297 18700 18681 1297 18700	Sample Number		Client Info		GFL0104842	GFL0104939	GFL0104854
Oil Age hrs Client Info 18523 18523 1297 Oil Changed Client Info N/A N/A N/A N/A Sample Status MARGINAL ABNORMAL SEVERE CONTAMINATION method limit/base current history1 history2 Water WC Method NEG NEG NEG NEG WEAR METALS method limit/base current history1 history2 WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >75 28 23 17 Chromium ppm ASTM D5185m >5 2 1 <1 Chromium ppm ASTM D5185m >4 <1 0 <1 Lead ppm ASTM D5185m >2 0 0 0 Copper ppm ASTM D5185m >100 1 1 <1 <1	Sample Date		Client Info		04 Apr 2024	06 Feb 2024	25 Jan 2024
Coli Changed Colient Info N/A N/A ABNORMAL SEVERE	Machine Age	hrs	Client Info		19820	18700	18681
MARGINAL ABNORMAL SEVERE	Oil Age	hrs	Client Info		18523	18523	1297
CONTAMINATION method limit/base current history1 history2 Water WC Method NEG NEG NEG Glycol WC Method NEG NEG NEG WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >75 28 23 17 Chromium ppm ASTM D5185m >5 2 1 <1	Oil Changed		Client Info		N/A	N/A	N/A
Water WC Method >0.2 NEG A 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Sample Status				MARGINAL	ABNORMAL	SEVERE
WEAR METALS	CONTAMINAT	ΓΙΟΝ	method	limit/base	current	history1	history2
WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >75 28 23 17 Chromium ppm ASTM D5185m >5 2 1 <1	Water		WC Method	>0.2	NEG	NEG	NEG
Iron	Glycol		WC Method		NEG	NEG	NEG
Chromium ppm ASTM D5185m >5 2 1 <1 Nickel ppm ASTM D5185m >4 <1 0 <1 Titanium ppm ASTM D5185m >2 <1 0 0 Silver ppm ASTM D5185m >2 0 0 0 Aluminum ppm ASTM D5185m >2 0 0 0 Aluminum ppm ASTM D5185m >2 0 0 0 Lead ppm ASTM D5185m >2 1 <1 <1 <1 Copper ppm ASTM D5185m >4 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	WEAR METAL	_S	method	limit/base	current	history1	history2
Nickel	Iron	ppm	ASTM D5185m	>75	28	23	17
Silver	Chromium	ppm	ASTM D5185m	>5	2	1	<1
Silver	Nickel	ppm	ASTM D5185m	>4	<1	0	<1
Aluminum ppm ASTM D5185m >15 4 2 3 Lead ppm ASTM D5185m >25 1 <1 <1 Copper ppm ASTM D5185m >100 1 1 <1 Tin ppm ASTM D5185m >4 1 <1 <1 Vanadium ppm ASTM D5185m >4 1 <1 <1 Vanadium ppm ASTM D5185m <1 0 <1 Cadmium ppm ASTM D5185m <1 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 0 0 0 Molybdenum ppm ASTM D5185m 0 0 0 0 Molybdenum ppm ASTM D5185m 0 0 0 0 Magnesium ppm ASTM D5185m 00 0 0 0 Magnesium ppm ASTM D5185m 1010 1016 951 837 Calcium ppm ASTM D5185m 1070 1140 960 898 Phosphorus ppm ASTM D5185m 1150 1076 970 905 Zinc ppm ASTM D5185m 1270 1322 1221 1133 Sulfur ppm ASTM D5185m 2060 3334 2920 2630 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 5 4 4 Potassium ppm ASTM D5185m >20 5 1 <1 Fuel % ASTM D5185m >20 5 1 <1 INFRA-RED method limit/base current history1 history2 Soot % % "ASTM D7844 >6 1.2 1 0.9 Nitration Abs/.1mm "ASTM D7415 >30 22.5 21.9 21.4 FLUID DEGRADATION method limit/base current history1 history2 Dxidation Abs/.1mm "ASTM D7414 >25 18.7 19.5 19.4	Titanium	ppm	ASTM D5185m	>2	<1	0	0
Lead ppm ASTM D5185m >25 1 <1 <1 Copper ppm ASTM D5185m >100 1 1 <1 Tin ppm ASTM D5185m >4 1 <1 <1 Vanadium ppm ASTM D5185m >4 1 <1 <1 Cadmium ppm ASTM D5185m <1 0 <1 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 0 <1 1 Barium ppm ASTM D5185m 0 0 0 0 0 Molybdenum ppm ASTM D5185m 0 0 0 0 0 Magnesium ppm ASTM D5185m 0 1 <1 <1 <1 Calcium ppm ASTM D5185m 1070 1140 960 898 Phosphorus ppm ASTM D5185m	Silver	ppm	ASTM D5185m	>2	0	0	0
Copper ppm ASTM D5185m >100 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	Aluminum	ppm	ASTM D5185m	>15	4	2	3
Copper ppm ASTM D5185m >100 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	Lead	ppm	ASTM D5185m	>25	1	<1	<1
Trin	Copper		ASTM D5185m	>100	1	1	<1
Vanadium ppm ASTM D5185m <1 0 <1 Cadmium ppm ASTM D5185m <1 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 0 <1 1 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 1010 1016 951 837 Calcium ppm ASTM D5185m 1070 1140 960 898 Phosphorus ppm ASTM D5185m 1270 1322 1221 1133 Zilinc ppm ASTM D5185m 1270 1322 1221 1133 Sulfur ppm ASTM D5185m >25 5					1	<1	<1
ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 0 <1	/anadium				<1	0	<1
Boron							
Barium ppm ASTM D5185m 0 0 0 0 Molybdenum ppm ASTM D5185m 60 62 55 52 Manganese ppm ASTM D5185m 0 1 <1	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum ppm ASTM D5185m 60 62 55 52 Manganese ppm ASTM D5185m 0 1 <1	Boron	ppm	ASTM D5185m	0	0	<1	1
Manganese ppm ASTM D5185m 0 1 <1 <1 Magnesium ppm ASTM D5185m 1010 1016 951 837 Calcium ppm ASTM D5185m 1070 1140 960 898 Phosphorus ppm ASTM D5185m 1150 1076 970 905 Zinc ppm ASTM D5185m 1270 1322 1221 1133 Sulfur ppm ASTM D5185m 2060 3334 2920 2630 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 5 4 4 Sodium ppm ASTM D5185m >20 5 1 <1	Barium	ppm	ASTM D5185m	0	0	0	0
Magnesium ppm ASTM D5185m 1010 1016 951 837 Calcium ppm ASTM D5185m 1070 1140 960 898 Phosphorus ppm ASTM D5185m 1150 1076 970 905 Zinc ppm ASTM D5185m 1270 1322 1221 1133 Sulfur ppm ASTM D5185m 2060 3334 2920 2630 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 5 4 4 Sodium ppm ASTM D5185m >20 5 1 <1	Molybdenum	ppm	ASTM D5185m	60	62	55	52
Calcium ppm ASTM D5185m 1070 1140 960 898 Phosphorus ppm ASTM D5185m 1150 1076 970 905 Zinc ppm ASTM D5185m 1270 1322 1221 1133 Sulfur ppm ASTM D5185m 2060 3334 2920 2630 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 5 4 4 Sodium ppm ASTM D5185m >20 5 1 <1	Manganese	ppm	ASTM D5185m	0	1	<1	<1
Phosphorus ppm ASTM D5185m 1150 1076 970 905 Zinc ppm ASTM D5185m 1270 1322 1221 1133 Sulfur ppm ASTM D5185m 2060 3334 2920 2630 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 5 4 4 Sodium ppm ASTM D5185m >20 5 1 <1	Magnesium	ppm	ASTM D5185m	1010	1016	951	837
Zinc ppm ASTM D5185m 1270 1322 1221 1133 Sulfur ppm ASTM D5185m 2060 3334 2920 2630 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 5 4 4 Sodium ppm ASTM D5185m 6 4 4 Potassium ppm ASTM D5185m >20 5 1 <1	Calcium	ppm	ASTM D5185m	1070	1140	960	898
Zinc ppm ASTM D5185m 1270 1322 1221 1133 Sulfur ppm ASTM D5185m 2060 3334 2920 2630 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 5 4 4 Sodium ppm ASTM D5185m 6 4 4 Potassium ppm ASTM D5185m >20 5 1 <1	Phosphorus	ppm	ASTM D5185m	1150	1076	970	905
Sulfur ppm ASTM D5185m 2060 3334 2920 2630 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 5 4 4 Sodium ppm ASTM D5185m 6 4 4 Potassium ppm ASTM D5185m >20 5 1 <1			ASTM D5185m	1270	1322	1221	1133
Silicon ppm ASTM D5185m >25 5 4 4 Sodium ppm ASTM D5185m 6 4 4 Potassium ppm ASTM D5185m >20 5 1 <1 Fuel % ASTM D3524 >3.0 2.5 △ 3.6 △ 6.6 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >6 1.2 1 0.9 Nitration Abs/cm *ASTM D7624 >20 9.6 10.1 10.0 Sulfation Abs/.1mm *ASTM D7415 >30 22.5 21.9 21.4 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 18.7 19.5 19.4	Sulfur		ASTM D5185m	2060	3334	2920	2630
Sodium ppm ASTM D5185m 6 4 4 Potassium ppm ASTM D5185m >20 5 1 <1	CONTAMINA	NTS	method	limit/base	current	history1	history2
Potassium ppm ASTM D5185m >20 5 1 <1 Fuel % ASTM D3524 >3.0 ▲ 2.5 ▲ 3.6 ▲ 6.6 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >6 1.2 1 0.9 Nitration Abs/cm *ASTM D7624 >20 9.6 10.1 10.0 Sulfation Abs/.1mm *ASTM D7415 >30 22.5 21.9 21.4 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 18.7 19.5 19.4	Silicon	ppm	ASTM D5185m	>25	5	4	4
Fuel % ASTM D3524 >3.0 ▲ 2.5 ▲ 3.6 ▲ 6.6 INFRA-RED method limit/base current history1 history2 Soot % *ASTM D7844 >6 1.2 1 0.9 Nitration Abs/cm *ASTM D7624 >20 9.6 10.1 10.0 Sulfation Abs/.1mm *ASTM D7415 >30 22.5 21.9 21.4 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 18.7 19.5 19.4	Sodium	ppm	ASTM D5185m		6	4	4
INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >6 1.2 1 0.9 Nitration Abs/cm *ASTM D7624 >20 9.6 10.1 10.0 Sulfation Abs/.1mm *ASTM D7415 >30 22.5 21.9 21.4 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 18.7 19.5 19.4	Potassium	ppm	ASTM D5185m	>20	5	1	<1
Soot % *ASTM D7844 >6 1.2 1 0.9 Nitration Abs/cm *ASTM D7624 >20 9.6 10.1 10.0 Sulfation Abs/.1mm *ASTM D7415 >30 22.5 21.9 21.4 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 18.7 19.5 19.4	Fuel	%	ASTM D3524	>3.0	<u> </u>	▲ 3.6	▲ 6.6
Nitration Abs/cm *ASTM D7624 > 20 9.6 10.1 10.0 Sulfation Abs/.1mm *ASTM D7415 > 30 22.5 21.9 21.4 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 > 25 18.7 19.5 19.4	INFRA-RED		method	limit/base	current	history1	history2
Nitration Abs/cm *ASTM D7624 >20 9.6 10.1 10.0 Sulfation Abs/.1mm *ASTM D7415 >30 22.5 21.9 21.4 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 18.7 19.5 19.4	Soot %	%	*ASTM D7844	>6	1.2	1	0.9
Sulfation Abs/.1mm *ASTM D7415 >30 22.5 21.9 21.4 FLUID DEGRADATION method limit/base current history1 history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 18.7 19.5 19.4	Nitration	Abs/cm		>20			
Oxidation Abs/.1mm *ASTM D7414 >25 18.7 19.5 19.4							
	FLUID DEGRA	DATION	method	limit/base	current	history1	history2
	Oxidation	Abs/.1mm	*ASTM D7414	>25	18.7	19.5	19.4
	Base Number (BN)	mg KOH/g	ASTM D2896	9.8	8.1	8.3	7.8

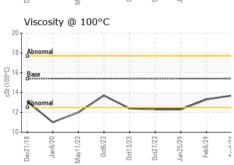


OIL ANALYSIS REPORT





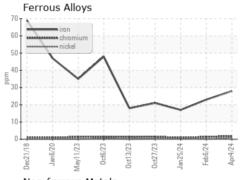


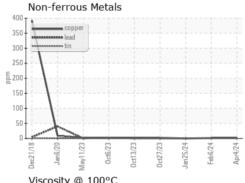


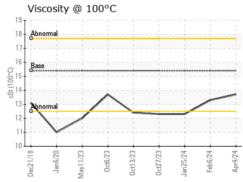
VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual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

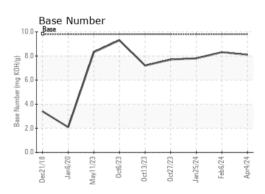
FLUID PROPERTIES		method	limit/base	current	history1	history2	
Visc @ 100°C	cSt	ASTM D445	15.4	13.7	13.3	12.3	

GRAPHS













Laboratory Sample No.

: GFL0104842 Lab Number : 06143652 Unique Number : 10968460

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 Received : 09 Apr 2024

Tested : 15 Apr 2024 Diagnosed

: 15 Apr 2024 - Wes Davis

US 64801 Contact: James Jarrett jjarrett@gflenv.com T: (417)310-2802

3700 West 7th Street

GFL Environmental - 820 - Joplin Hauling

Certificate 12367

Test Package : FLEET (Additional Tests: PercentFuel) 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)

Report Id: GFL820 [WUSCAR] 06143652 (Generated: 04/15/2024 09:30:38) Rev: 1

Joplin, MO