

OIL ANALYSIS REPORT



(YA141184) 2424 Component **Diesel Engine**

PETRO CANADA DURON SHP 15W40 (40 GAL)



Sample Rating Trend



DIAGNOSIS

Recommendation

Resample at the next service interval to monitor.

All component wear rates are normal.

Contamination

Fuel content negligible. There is no indication of any contamination in the oil.

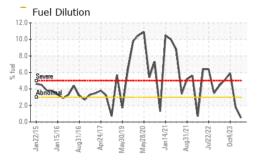
Fluid Condition

The oil viscosity is lower than normal. The BN result indicates that there is suitable alkalinity remaining in the oil. Confirm oil type.

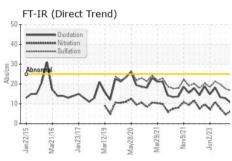
Sample Number Client Info GFL0115943 GFL0089965 GFL0080561 Sample Date Client Info 18 Jun 2024 24 Oct 2023 04 Oct 2023 04 Oct 2023 05 Oct 2023	SAMPLE INFORMA	ATION	method	limit/base	current	history1	history2
Machine Age mls Client Info 412544 <th< td=""><td>Sample Number</td><td></td><td>Client Info</td><td></td><th>GFL0115943</th><td>GFL0089965</td><td>GFL0080561</td></th<>	Sample Number		Client Info		GFL0115943	GFL0089965	GFL0080561
Oil Age mls Client Info Not Changd Not Changed Changed Changed Changed Changed Changed Changed Changed Changed Changed Changed Changed Changed Changed Changed Changed ATTENTION NORMAL SEVERE CONTAMINATION method limit/base current history1 history2 Water WC Method NEG NEG NEG NEG Glycol WC Method NEG NEG NEG NEG WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >120 10 2 10 Chromium ppm ASTM D5185m >20 0 <1	Sample Date		Client Info		18 Jun 2024	24 Oct 2023	04 Oct 2023
Oil Changed Sample Status Client Info Not Changed ATTENTION Changed Changed Changed ATTENTION Changed NORMAL SEVERE CONTAMINATION method limit/base current bistory1 bistory2 Water WC Method >0.2 NEG NEG NEG NEG WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >120 10 2 10 Chromium ppm ASTM D5185m >120 0 <1 <1 0 Chromium ppm ASTM D5185m >20 0 <1 <1 0 Chromium ppm ASTM D5185m >20 0 <1 <1 0 Silver ppm ASTM D5185m >20 3 2 <1 0 0 Copper ppm ASTM D5185m >20 3 2 <1 0 Copper ppm ASTM D5185m >15 <1	Machine Age r	mls	Client Info		412544	412544	412544
Oil Changed Sample Status Client Info Not Changed ATTENTION Changed Changed SEVERE Changed SEVERE CONTAMINATION method limit/base current history1 history2 Water WC Method >0.2. NEG NEG NEG NEG WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >12.0 10 2 10 Chromium ppm ASTM D5185m >20 0 <1 <1 0 Chromium ppm ASTM D5185m >20 0 <1 <1 0 Chromium ppm ASTM D5185m >20 0 <1 <1 0 Silver ppm ASTM D5185m >2 <1 0 0 0 Copper ppm ASTM D5185m >20 3 2 <1 0 Copper ppm ASTM D5185m >330 0 <1 <1 <	Oil Age r	mls	Client Info		0	412544	412544
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WEAR METALS	CONTAMINATIO	NC	method	limit/base	current	history1	history2
WEAR METALS	Water		WC Method	>0.2	NEG	NEG	NEG
Iron	Glycol		WC Method		NEG	NEG	NEG
Chromium	WEAR METALS		method	limit/base	current	history1	history2
Nickel	Iron p	ppm	ASTM D5185m	>120	10	2	10
Titanium	Chromium p	ppm	ASTM D5185m	>20	0	<1	<1
Titanium ppm ASTM D5185m >2 <1 <1 0 Silver ppm ASTM D5185m >2 0 0 0 Aluminum ppm ASTM D5185m >20 3 2 <1 Lead ppm ASTM D5185m >40 0 <1 0 Copper ppm ASTM D5185m >40 0 <1 <1 Tin ppm ASTM D5185m 0 0 <1 0 Vanadium ppm ASTM D5185m 0 0 0 0 Cadmium ppm ASTM D5185m 0 13 7 3 Boron ppm ASTM D5185m 0 13 7 3 Barium ppm ASTM D5185m 0 13 7 3 Barium ppm ASTM D5185m 0 4 1 0 <1 Magnesium ppm ASTM D5185m 0 4 1	Nickel p	ppm	ASTM D5185m	>5	<1	0	0
Silver			ASTM D5185m	>2	<1	<1	0
Aluminum ppm ASTM D5185m >20 3 2 <1 Lead ppm ASTM D5185m >40 0 <1	Silver p	ppm	ASTM D5185m	>2	0	0	0
Lead ppm ASTM D5185m >40 0 <1 0 Copper ppm ASTM D5185m >330 0 <1 <1 Tin ppm ASTM D5185m >15 <1 0 0 Vanadium ppm ASTM D5185m 0 0 0 0 Cadmium ppm ASTM D5185m 0 13 7 3 Boron ppm ASTM D5185m 0 13 7 3 Barium ppm ASTM D5185m 0 0 3 0 Molybdenum ppm ASTM D5185m 0 0 3 0 Molybdenum ppm ASTM D5185m 0 4 0 <1 0 <1 Magnesium ppm ASTM D5185m 0 41 0 <1 0 <1 Calcium ppm ASTM D5185m 1070 2197 1104 1012 104 1012 Zinc<			ASTM D5185m	>20	3	2	<1
Copper ppm ASTM D5185m >330 0 <1 <1 Tin ppm ASTM D5185m >15 <1			ASTM D5185m	>40	0	<1	0
Tin			ASTM D5185m	>330	0	<1	<1
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Manganese ppm ASTM D5185m 0 <1 0 <1 Magnesium ppm ASTM D5185m 1010 81 910 904 Calcium ppm ASTM D5185m 1070 2197 1104 1012 Phosphorus ppm ASTM D5185m 1150 928 1075 995 Zinc ppm ASTM D5185m 1270 1085 1228 1198 Sulfur ppm ASTM D5185m 2060 4205 3568 2973 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 8 3 2 Sodium ppm ASTM D5185m >20 5 2 6 Fuel % ASTM D3185m >20 5 2 6 Fuel % ASTM D3185m >20 5 1.8 5.9 INFRA-RED method <td></td> <td></td> <td></td> <td></td> <th></th> <td></td> <td></td>							
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Phosphorus ppm ASTM D5185m 1150 928 1075 995 Zinc ppm ASTM D5185m 1270 1085 1228 1198 Sulfur ppm ASTM D5185m 2060 4205 3568 2973 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 8 3 2 Sodium ppm ASTM D5185m 2 0 <1	Barium p Molybdenum p Manganese p	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	0 60 0	0 8 <1	3 63 0	0 55 <1
Zinc ppm ASTM D5185m 1270 1085 1228 1198 Sulfur ppm ASTM D5185m 2060 4205 3568 2973 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 8 3 2 Sodium ppm ASTM D5185m 2 0 <1	Barium p Molybdenum p Manganese p Magnesium p	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 60 0 1010	0 8 <1 81	3 63 0 910	0 55 <1 904
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Sodium ppm ASTM D5185m 2 0 <1 Potassium ppm ASTM D5185m >20 5 2 6 Fuel % ASTM D3524 >3.0 0.5 1.8 ▲ 5.9 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >4 0.1 0.3 1.7 Nitration Abs/cm *ASTM D7624 >20 6.4 4.6 7.5 Sulfation Abs/.1mm *ASTM D7415 >30 16.6 17.5 19.8 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 10.5 12.7 13.3	Barium p Molybdenum p Manganese p Magnesium p Calcium p Phosphorus p Zinc p Sulfur p	opm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 60 0 1010 1070 1150 1270 2060	0 8 <1 81 2197 928 1085 4205	3 63 0 910 1104 1075 1228 3568	0 55 <1 904 1012 995 1198 2973
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Soot % % *ASTM D7844 >4 0.1 0.3 1.7 Nitration Abs/cm *ASTM D7624 >20 6.4 4.6 7.5 Sulfation Abs/.1mm *ASTM D7415 >30 16.6 17.5 19.8 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 10.5 12.7 13.3	Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANT Silicon Sodium Potassium protassium	pppm pppm pppm pppm pppm pppm pppm ppp	ASTM D5185m	0 60 0 1010 1070 1150 1270 2060 limit/base >25	0 8 <1 81 2197 928 1085 4205 current 8 2	3 63 0 910 1104 1075 1228 3568 history1 3 0	0 55 <1 904 1012 995 1198 2973 history2 2 <1 6
Nitration Abs/cm *ASTM D7624 >20 6.4 4.6 7.5 Sulfation Abs/.1mm *ASTM D7415 >30 16.6 17.5 19.8 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 10.5 12.7 13.3	Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANT Silicon Sodium Potassium Fuel	pppm pppm pppm pppm pppm pppm pppm ppp	ASTM D5185m	0 60 0 1010 1070 1150 1270 2060 limit/base >25 >20 >3.0	0 8 <1 81 2197 928 1085 4205 current 8 2 5 0.5	3 63 0 910 1104 1075 1228 3568 history1 3 0 2 1.8	0 55 <1 904 1012 995 1198 2973 history2 2 <1 6 ▲ 5.9
Sulfation Abs/.1mm *ASTM D7415 >30 16.6 17.5 19.8 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 10.5 12.7 13.3	Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANT Silicon Sodium Potassium Fuel INFRA-RED	pppm pppm pppm pppm pppm pppm pppm ppp	ASTM D5185m	0 60 0 1010 1070 1150 1270 2060 limit/base >25 >20 >3.0	0 8 <1 81 2197 928 1085 4205 current 8 2 5 0.5	3 63 0 910 1104 1075 1228 3568 history1 3 0 2 1.8	0 55 <1 904 1012 995 1198 2973 history2 2 <1 6 ▲ 5.9 history2
FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 10.5 12.7 13.3	Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANT Silicon Sodium Potassium Fuel INFRA-RED Soot %	pppm pppm pppm pppm pppm pppm pppm ppp	ASTM D5185m ASTM D7844	0 60 0 1010 1070 1150 1270 2060 limit/base >25 >20 >3.0	0 8 <1 81 2197 928 1085 4205 current 8 2 5 0.5 current	3 63 0 910 1104 1075 1228 3568 history1 3 0 2 1.8 history1	0 55 <1 904 1012 995 1198 2973 history2 2 <1 6 ▲ 5.9 history2 1.7
Oxidation Abs/.1mm *ASTM D7414 >25 10.5 12.7 13.3	Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANT Silicon Sodium Potassium Fuel INFRA-RED Soot % Nitration	pppm pppm pppm pppm pppm pppm pppm ppp	ASTM D5185m ASTM D7824	0 60 0 1010 1070 1150 1270 2060 limit/base >25 >20 >3.0 limit/base >4 >20	0 8 <1 81 2197 928 1085 4205 current 8 2 5 0.5 current 0.1 6.4	3 63 0 910 1104 1075 1228 3568 history1 3 0 2 1.8 history1 0.3 4.6	0 55 <1 904 1012 995 1198 2973 history2 2 <1 6 ▲ 5.9 history2 1.7 7.5
	Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANT Silicon Sodium Potassium Fuel INFRA-RED Soot % Nitration	pppm pppm pppm pppm pppm pppm pppm ppp	ASTM D5185m ASTM D7824 method *ASTM D7844 *ASTM D7824	0 60 0 1010 1070 1150 1270 2060 limit/base >25 >20 >3.0 limit/base >4 >20	0 8 <1 81 2197 928 1085 4205 current 8 2 5 0.5 current 0.1 6.4	3 63 0 910 1104 1075 1228 3568 history1 3 0 2 1.8 history1 0.3 4.6	0 55 <1 904 1012 995 1198 2973 history2 2 <1 6 ▲ 5.9 history2 1.7 7.5
Base Number (BN) mg KOH/g ASTM D2896 9.8 7.4 9.3 8.7	Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANT Silicon Sodium Potassium Fuel INFRA-RED Soot % Nitration Sulfation	pppm pppm pppm pppm pppm pppm pppm ppp	ASTM D5185m ASTM D7844 *ASTM D7624 *ASTM D7415	0 60 0 1010 1070 1150 1270 2060 limit/base >25 >20 >3.0 limit/base >4 >20 >30	0 8 <1 81 2197 928 1085 4205 current 8 2 5 0.5 current 0.1 6.4 16.6	3 63 0 910 1104 1075 1228 3568 history1 3 0 2 1.8 history1 0.3 4.6 17.5	0 55 <1 904 1012 995 1198 2973 history2 2 <1 6 ▲ 5.9 history2 1.7 7.5 19.8
	Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANT Silicon Sodium Potassium Fuel INFRA-RED Soot % Nitration Sulfation FLUID DEGRADA	pppm pppm pppm pppm pppm pppm pppm ppp	ASTM D5185m ASTM D7824 method *ASTM D7824 *ASTM D7624 *ASTM D7615 method	0 60 0 1010 1070 1150 1270 2060 limit/base >25 >20 >3.0 limit/base >4 >20 >30 limit/base	0 8 <1 81 2197 928 1085 4205 current 8 2 5 0.5 current 0.1 6.4 16.6	3 63 0 910 1104 1075 1228 3568 history1 3 0 2 1.8 history1 0.3 4.6 17.5	0 55 <1 904 1012 995 1198 2973 history2 2 <1 6 ▲ 5.9 history2 1.7 7.5 19.8 history2

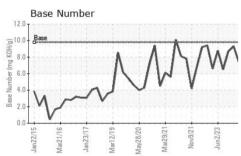


OIL ANALYSIS REPORT



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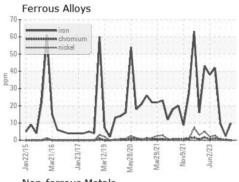


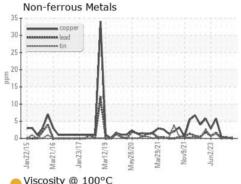


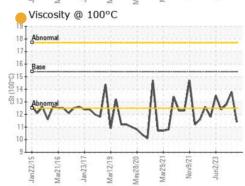
VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual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

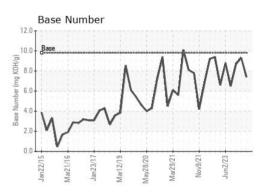
FLUID PROP	ERTIES					
Visc @ 100°C	cSt	ASTM D445	15.4	11.4	13.8	12.8

GRAPHS













Certificate 12367

Laboratory Sample No.

: GFL0115943 Lab Number : 06214475 Unique Number : 11087339

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 Received **Tested** Diagnosed

: 19 Jun 2024 : 21 Jun 2024

: 21 Jun 2024 - Don Baldridge Test Package: FLEET (Additional Tests: FuelDilution, PercentFuel)

GFL Environmental - 018 - Fayetteville 4621 Marracco Drive Hope Mills, NC US 28348 Contact: Robert Carter

robert.carter@gflenv.com T: (910)596-1170

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)