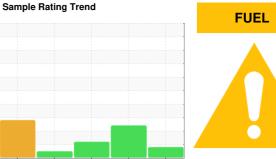


OIL ANALYSIS REPORT

DT





Machine Id
4560M
Component
Diesel Engine
Fluid

PETRO CANADA DURON SHP 15W40 (5 GAL)

DIAGNOSIS

Recommendation

We advise that you check the fuel injection system. Oil and filter change at the time of sampling has been noted. Resample at the next service interval to monitor.

Wear

All component wear rates are normal.

▲ Contamination

There is a moderate amount of fuel present in the

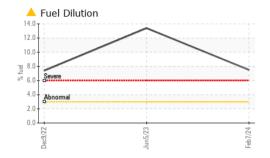
Fluid Condition

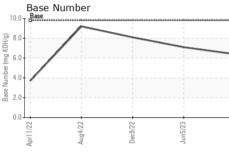
The BN result indicates that there is suitable alkalinity remaining in the oil.

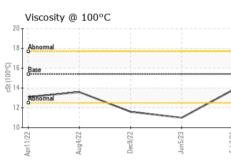
P	N SHP 15W40 (,	Apr2022	Aug2022	Dec2022 Jun2023		
Sample Date Client Info 07 Feb 2024 05 Jun 2023 09 Dec 2022	SAMPLE INFOR	MATION	method	limit/base	current	history1	history2
Machine Age	Sample Number		Client Info		GFL0106696	GFL0072955	GFL0060728
Oil Age hrs Client Info 303 421 481 Oil Changed Sample Status Client Info Changed C	Sample Date		Client Info		07 Feb 2024	05 Jun 2023	09 Dec 2022
Client Info	•	hrs	Client Info		5750	5447	5026
ABNORMAL SEVERE ABNORMAL CONTAMINATION method limit/base current history1 history2	Oil Age	hrs	Client Info		303	421	481
ABNORMAL SEVERE ABNORMAL CONTAMINATION method limit/base current history1 history2			Client Info		Changed	Changed	Changed
Water WC Method >0.2 NEG NEG NEG NEG WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >90 64 30 54 Chromium ppm ASTM D5185m >20 4 2 2 Nickel ppm ASTM D5185m >2 <1 <1 <1 <1 Silver ppm ASTM D5185m >2 <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 <t< td=""><td>Sample Status</td><td></td><td></td><td></td><td>ABNORMAL</td><td>SEVERE</td><td>ABNORMAL</td></t<>	Sample Status				ABNORMAL	SEVERE	ABNORMAL
WEAR METALS	CONTAMINAT	ION	method	limit/base	current	history1	history2
WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >90 64 30 54 Chromium ppm ASTM D5185m >20 4 2 2 Nickel ppm ASTM D5185m >2 <1	Water		WC Method	>0.2	NEG	NEG	NEG
Chromium	Glycol		WC Method		NEG	NEG	NEG
Chromium ppm ASTM D5185m >20 4 2 2 Nickel ppm ASTM D5185m >2 <1	WEAR METAL	S	method	limit/base	current	history1	history2
Silver	ron	ppm	ASTM D5185m	>90	64	30	54
Titanium	Chromium	ppm	ASTM D5185m	>20	4	2	2
Silver	Nickel	ppm	ASTM D5185m	>2	<1	<1	<1
Aluminum ppm ASTM D5185m >20 9 2 8 Lead ppm ASTM D5185m >40 4 4 4 4 Copper ppm ASTM D5185m >330 2 2 2 2 Tin ppm ASTM D5185m >1.5 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1	Titanium	ppm	ASTM D5185m	>2	<1	<1	0
Lead ppm ASTM D5185m >40 4 4 4 Copper ppm ASTM D5185m >330 2 2 2 Tin ppm ASTM D5185m >15 <1 <1 <1 Vanadium ppm ASTM D5185m 0 <1 0 <1 Cadmium ppm ASTM D5185m 0 3 2 2 Boron ppm ASTM D5185m 0 0 1 0 Barium ppm ASTM D5185m 0 0 1 0 Molybdenum ppm ASTM D5185m 0 52 48 47 Magnesium ppm ASTM D5185m 0 -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 <t< td=""><td>Silver</td><td>ppm</td><td>ASTM D5185m</td><td>>2</td><td>0</td><td>0</td><td><1</td></t<>	Silver	ppm	ASTM D5185m	>2	0	0	<1
Copper	Aluminum	ppm	ASTM D5185m	>20	9	2	8
Fin	_ead	ppm	ASTM D5185m	>40	4	4	4
Anadium ppm ASTM D5185m <1 0 <1 0 Cadmium ppm ASTM D5185m 0 <1 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 3 2 2 Barium ppm ASTM D5185m 0 0 1 0 Molybdenum ppm ASTM D5185m 0 <1 <1 <1 Manganese ppm ASTM D5185m 0 <1 <1 <1 <1 Magnesium ppm ASTM D5185m 1010 889 738 683 Calcium ppm ASTM D5185m 1070 1000 878 856 Phosphorus ppm ASTM D5185m 1270 1210 1048 985 Sulfur ppm ASTM D5185m 1270 1210 1048 985 CONTAMINANTS method limit/base current<	Copper	ppm	ASTM D5185m	>330	2	2	2
Cadmium ppm ASTM D5185m 0 <1 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 3 2 2 Barium ppm ASTM D5185m 0 0 1 0 Molybdenum ppm ASTM D5185m 60 52 48 47 Manganese ppm ASTM D5185m 0 <1	Гіп	ppm	ASTM D5185m	>15	<1	<1	<1
ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 3 2 2 Barium ppm ASTM D5185m 0 0 1 0 Molybdenum ppm ASTM D5185m 0 <1	/anadium	ppm	ASTM D5185m		<1	0	<1
Boron	Cadmium	ppm	ASTM D5185m		0	<1	0
Barium	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum ppm ASTM D5185m 60 52 48 47 Manganese ppm ASTM D5185m 0 <1	Boron	ppm	ASTM D5185m	0	3	2	2
Manganese ppm ASTM D5185m 0 <1 <1 <1 Magnesium ppm ASTM D5185m 1010 889 738 683 Calcium ppm ASTM D5185m 1070 1000 878 856 Phosphorus ppm ASTM D5185m 1150 996 836 780 Zinc ppm ASTM D5185m 1270 1210 1048 985 Sulfur ppm ASTM D5185m 2060 2837 2901 2535 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 9 5 6 Godium ppm ASTM D5185m >20 5 4 8 Fuel % ASTM D5185m >20 5 4 8 Fuel % ASTM D5185m >20 5 4 8 Fuel % ASTM D5185m >20 <th< td=""><td>Barium</td><td>ppm</td><td>ASTM D5185m</td><td>0</td><td>0</td><td>1</td><td>0</td></th<>	Barium	ppm	ASTM D5185m	0	0	1	0
Magnesium ppm ASTM D5185m 1010 889 738 683 Calcium ppm ASTM D5185m 1070 1000 878 856 Phosphorus ppm ASTM D5185m 1150 996 836 780 Zinc ppm ASTM D5185m 1270 1210 1048 985 Sulfur ppm ASTM D5185m 2060 2837 2901 2535 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 9 5 6 Sodium ppm ASTM D5185m >20 5 4 8 Potassium ppm ASTM D5185m >20 5 4 8 Fuel % ASTM D3524 >3.0 7.5 13.4 7.4 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7624	Molybdenum	ppm	ASTM D5185m	60	52	48	47
Calcium ppm ASTM D5185m 1 070 1000 878 856 Phosphorus ppm ASTM D5185m 1 150 996 836 780 Zinc ppm ASTM D5185m 1 270 1 210 1 048 985 Sulfur ppm ASTM D5185m 2060 2837 2901 2535 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 9 5 6 Sodium ppm ASTM D5185m >20 5 4 8 Fuel % ASTM D5185m >20 5 4 8 Fuel % ASTM D3524 >3.0 7.5 13.4 7.4 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7624 >20 19.0 12.9 14.7 Sulfation Abs/.1mm *ASTM D7415 <td< td=""><td>Manganese</td><td>ppm</td><td>ASTM D5185m</td><td>0</td><td><1</td><td><1</td><td><1</td></td<>	Manganese	ppm	ASTM D5185m	0	<1	<1	<1
Phosphorus ppm ASTM D5185m 1150 996 836 780 Zinc ppm ASTM D5185m 1270 1210 1048 985 Sulfur ppm ASTM D5185m 2060 2837 2901 2535 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 9 5 6 Sodium ppm ASTM D5185m 9 6 6 Potassium ppm ASTM D5185m >20 5 4 8 Fuel % ASTM D5185m >20 5 4 8 Fuel % ASTM D3524 >3.0 7.5 13.4 ^7.4 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >6 2.3 1.2 1.7 Nitration Abs/cm *ASTM D7415 >30 30.	Magnesium	maa		1010	000		000
Zinc ppm ASTM D5185m 1270 1210 1048 985 Sulfur ppm ASTM D5185m 2060 2837 2901 2535 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 9 5 6 Sodium ppm ASTM D5185m 9 6 6 Potassium ppm ASTM D5185m >20 5 4 8 Fuel % ASTM D3524 >3.0 7.5 13.4 ^ 7.4 INFRA-RED method limit/base current history1 <td>Calcium</td> <td>le le</td> <td>ASTM D5185m</td> <td>1010</td> <td>889</td> <td>738</td> <td>683</td>	Calcium	le le	ASTM D5185m	1010	889	738	683
Sulfur ppm ASTM D5185m 2060 2837 2901 2535 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 9 5 6 Sodium ppm ASTM D5185m 9 6 6 Potassium ppm ASTM D5185m >20 5 4 8 Fuel % ASTM D3524 >3.0 7.5 13.4 ^ 7.4 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >6 2.3 1.2 1.7 Nitration Abs/cm *ASTM D7624 >20 19.0 12.9 14.7 Sulfation Abs/.1mm *ASTM D7415 >30 30.6 22.9 26.1 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414	Jaiolaili						
CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 9 5 6 Sodium ppm ASTM D5185m 9 6 6 Potassium ppm ASTM D5185m >20 5 4 8 Fuel % ASTM D3524 >3.0 7.5 13.4 ^7.4 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >6 2.3 1.2 1.7 Nitration Abs/cm *ASTM D7624 >20 19.0 12.9 14.7 Sulfation Abs/.1mm *ASTM D7415 >30 30.6 22.9 26.1 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 35.1 23.0 25.6		ppm	ASTM D5185m	1070	1000	878	856
Soliticon ppm ASTM D5185m >25 9 5 6 Sodium ppm ASTM D5185m 9 6 6 Potassium ppm ASTM D5185m >20 5 4 8 Fuel % ASTM D3524 >3.0 7.5 13.4 7.4 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >6 2.3 1.2 1.7 Nitration Abs/cm *ASTM D7624 >20 19.0 12.9 14.7 Sulfation Abs/.1mm *ASTM D7415 >30 30.6 22.9 26.1 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 35.1 23.0 25.6	Phosphorus	ppm ppm	ASTM D5185m ASTM D5185m	1070 1150	1000 996	878 836	856 780
Sodium ppm ASTM D5185m 9 6 6 Potassium ppm ASTM D5185m >20 5 4 8 Fuel % ASTM D3524 >3.0 7.5 13.4 13.4 7.4 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >6 2.3 1.2 1.7 Nitration Abs/cm *ASTM D7624 >20 19.0 12.9 14.7 Sulfation Abs/.1mm *ASTM D7415 >30 30.6 22.9 26.1 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 35.1 23.0 25.6	Phosphorus Zinc	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	1070 1150 1270	1000 996 1210	878 836 1048	856 780 985
Potassium ppm ASTM D5185m >20 5 4 8 Fuel % ASTM D3524 >3.0 ▲ 7.5 ■ 13.4 ▲ 7.4 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >6 2.3 1.2 1.7 Nitration Abs/cm *ASTM D7624 >20 19.0 12.9 14.7 Sulfation Abs/.1mm *ASTM D7415 >30 30.6 22.9 26.1 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 35.1 23.0 25.6	Phosphorus Zinc Sulfur	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	1070 1150 1270 2060	1000 996 1210 2837	878 836 1048 2901	856 780 985 2535
Fuel % ASTM D3524 >3.0	Phosphorus Zinc Sulfur CONTAMINAN	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m method	1070 1150 1270 2060 limit/base	1000 996 1210 2837 current	878 836 1048 2901 history1	856 780 985 2535 history2
INFRA-RED	Phosphorus Zinc Sulfur CONTAMINAN Silicon	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m method ASTM D5185m	1070 1150 1270 2060 limit/base	1000 996 1210 2837 current	878 836 1048 2901 history1	856 780 985 2535 history2
Soot % % *ASTM D7844 >6 2.3 1.2 1.7 Nitration Abs/cm *ASTM D7624 >20 19.0 12.9 14.7 Sulfation Abs/.1mm *ASTM D7415 >30 30.6 22.9 26.1 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 35.1 23.0 25.6	Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m method ASTM D5185m ASTM D5185m	1070 1150 1270 2060 limit/base >25	1000 996 1210 2837 current 9	878 836 1048 2901 history1 5	856 780 985 2535 history2 6 6
Nitration Abs/cm *ASTM D7624 >20 19.0 12.9 14.7 Sulfation Abs/.1mm *ASTM D7415 >30 30.6 22.9 26.1 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 35.1 23.0 25.6	Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium	ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m Method ASTM D5185m ASTM D5185m ASTM D5185m	1070 1150 1270 2060 limit/base >25	1000 996 1210 2837 current 9 9	878 836 1048 2901 history1 5 6	856 780 985 2535 history2 6 6 8
Nitration Abs/cm *ASTM D7624 >20 19.0 12.9 14.7 Sulfation Abs/.1mm *ASTM D7415 >30 30.6 22.9 26.1 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 35.1 23.0 25.6	Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Fuel	ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	1070 1150 1270 2060 limit/base >25 >20 >3.0	1000 996 1210 2837 current 9 9 5	878 836 1048 2901 history1 5 6 4	856 780 985 2535 history2 6 6 8
Sulfation Abs/.1mm *ASTM D7415 >30 30.6 22.9 26.1 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 35.1 23.0 25.6	Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Fuel INFRA-RED	ppm ppm ppm ppm ITS ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D3524	1070 1150 1270 2060 limit/base >25 >20 >3.0	1000 996 1210 2837 current 9 9 5 ^ 7.5	878 836 1048 2901 history1 5 6 4 • 13.4 history1	856 780 985 2535 history2 6 6 8 ▲ 7.4 history2
Oxidation	Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Fuel INFRA-RED Soot %	ppm ppm ppm ppm ITS ppm ppm ppm %	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D3524 method *ASTM D7844	1070 1150 1270 2060 limit/base >25 >20 >3.0 limit/base >6	1000 996 1210 2837	878 836 1048 2901 history1 5 6 4 13.4 history1	856 780 985 2535 history2 6 6 8 ▲ 7.4 history2 1.7
	Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Fuel INFRA-RED Soot % Nitration	ppm ppm ppm ppm ppm ppm ppm ppm %	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D7844 *ASTM D7624	1070 1150 1270 2060 limit/base >25 >20 >3.0 limit/base >6 >20	1000 996 1210 2837	878 836 1048 2901 history1 5 6 4 13.4 history1 1.2 12.9	856 780 985 2535 history2 6 6 8 ▲ 7.4 history2 1.7 14.7
	Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Fuel INFRA-RED Soot % Nitration Sulfation	ppm ppm ppm ppm ITS ppm ppm ppm %	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m Method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D3524 Method *ASTM D7844 *ASTM D7624 *ASTM D7415	1070 1150 1270 2060 limit/base >25 >20 >3.0 limit/base >6 >20 >30	1000 996 1210 2837 current 9 9 5 ▲ 7.5 current 2.3 19.0 30.6	878 836 1048 2901 history1 5 6 4 13.4 history1 1.2 12.9 22.9	856 780 985 2535 history2 6 6 8 ▲ 7.4 history2 1.7 14.7 26.1
	Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Fuel INFRA-RED Soot % Nitration Sulfation FLUID DEGRAE	ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D7844 *ASTM D7844 *ASTM D7624 *ASTM D7415 method	1070 1150 1270 2060 limit/base >25 >20 >3.0 limit/base >6 >20 >30 limit/base	1000 996 1210 2837 current 9 9 5 7.5 current 2.3 19.0 30.6 current	878 836 1048 2901 history1 5 6 4 13.4 history1 1.2 12.9 22.9 history1	856 780 985 2535 history2 6 6 8 ▲ 7.4 history2 1.7 14.7 26.1 history2

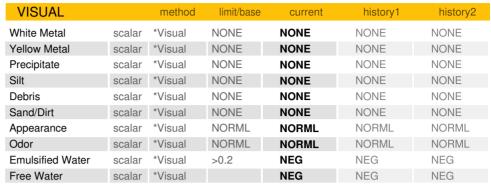


OIL ANALYSIS REPORT



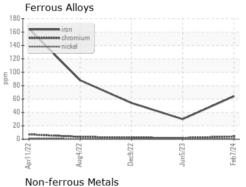


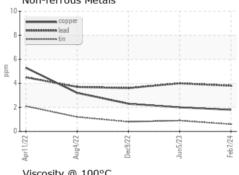


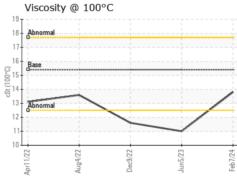


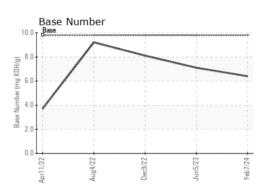
FLUID FROF	ENTIES	method	IIIIII/Dase	Current	HISTORY	HISTORYZ
Visc @ 100°C	cSt	ASTM D445	15.4	13.8	▲ 11.0	▲ 11.6

GRAPHS













Laboratory Sample No. Lab Number : 06092623 **Unique Number** : 10885476

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 : GFL0106696

Received : 19 Feb 2024 **Tested**

: 20 Feb 2024 : 20 Feb 2024 - Don Baldridge Diagnosed

GFL Environmental - 405 - Arbor Hills 7400 Napier Rd NORTHVILLE, MI

US 48168 Contact: John Nahal

jnahal@gflenv.com

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)

T: F: