

OIL ANALYSIS REPORT

Sample Rating Trend





(BC30861)
Machine Id
4690M
Component

Diesel Engine

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

DIAGNOSIS

Recommendation

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

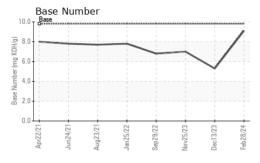
Fluid Condition

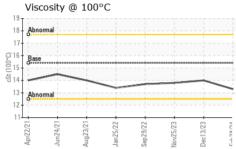
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

SAMPLE INFORMATION method limit/base current history1 history2	N SHP 15W40 (- GAL)	Apr2021 .	Jun2021 Aug2021 Jan20	122 Sep 2022 Nov2023 Dec202	3 Feb2024	
Sample Date	SAMPLE INFORI	MATION	method	limit/base	current	history1	history2
Machine Age hrs Client Info 16108 15553 15441 2600	Sample Number		Client Info		GFL0108821	GFL0105604	GFL0101409
Oil Age hrs Client Info 15553 15441 2600 Oil Changed Sample Status Client Info Changed Chan	Sample Date		Client Info		28 Feb 2024	13 Dec 2023	25 Nov 2023
Client Info Changed NORMAL NORMAL ABNORMAL	Machine Age	hrs	Client Info		16108	15553	15441
CONTAMINATION method minit/base current history1 history2	Oil Age	hrs	Client Info		15553	15441	2600
CONTAMINATION method limit/base current history1 history2	Oil Changed		Client Info		Changed	Changed	Changed
Fuel WC Method VC Method Water WC Method WC Method WC Method NEG	Sample Status				NORMAL	NORMAL	ABNORMAL
Water Glycol WC Method >0.2 NEG NEG NEG WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >90 8 34 27 Chromium ppm ASTM D5185m >20 <1	CONTAMINAT	ION	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
Potential Pot	Glycol		WC Method		NEG	NEG	△ 0.06
Chromium ppm ASTM D5185m >20	WEAR METAL	S	method	limit/base	current	history1	history2
Nickel	ron	ppm	ASTM D5185m	>90	8	34	27
Description	Chromium	ppm	ASTM D5185m	>20	<1	<1	<1
Titanium ppm ASTM D5185m >2 <1 0 0 Silver ppm ASTM D5185m >2 0 0 0 Aluminum ppm ASTM D5185m >20 3 4 3 Lead ppm ASTM D5185m >40 0 <1 0 Copper ppm ASTM D5185m >30 <1 3 10 Copper ppm ASTM D5185m >15 <1 0 <1 Vanadium ppm ASTM D5185m >15 <1 0 <1 Cadmium ppm ASTM D5185m <1 0 0 Boron ppm ASTM D5185m 0 3 7 18 Boron ppm ASTM D5185m 0 0 0 0 Abdroybdenum ppm ASTM D5185m 0 0 0 0 Barium ppm ASTM D5185m 100 0 1	Nickel		ASTM D5185m	>2	<1	0	0
Aluminum ppm ASTM D5185m >20 3 4 3 Lead ppm ASTM D5185m >40 0 <1 0 Copper ppm ASTM D5185m >330 <1 3 10 Tin ppm ASTM D5185m >15 <1 0 <1 Cadmium ppm ASTM D5185m >15 <1 0 0 Cadmium ppm ASTM D5185m <10 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 0 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 1010 948 1037 901 Calcium ppm ASTM D5185m 1070 1005 1194 1012 Phosphorus ppm ASTM D5185m 1070 1005 1194 1012 Phosphorus ppm ASTM D5185m 1270 1259 1269 1226 Sulfur ppm ASTM D5185m 2060 3319 2673 2563 CONTAMINANTS method limit/base current history1 history2 Boodium ppm ASTM D5185m >20 2 <1 1 102 INFRA-RED method limit/base current history1 history2 Soot % % "ASTM D7844 >6 0.3 0.8 0.7 Nitration Abs/.1mm "ASTM D7845 >30 17.8 24.5 23.5 FLUID DEGRADATION method limit/base current history1 history2 Dxidation Abs/.1mm "ASTM D7841 >25 13.2 24.1 21.5	Titanium	ppm	ASTM D5185m	>2	<1	0	0
Aluminum	Silver	ppm	ASTM D5185m	>2	0	0	0
Copper	Aluminum	ppm	ASTM D5185m	>20	3	4	3
Copper	Lead	ppm	ASTM D5185m	>40	0	<1	0
Vanadium ppm ASTM D5185m <1 0 0 Cadmium ppm ASTM D5185m <1 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 3 7 18 Barium ppm ASTM D5185m 0 0 0 0 Molybdenum ppm ASTM D5185m 0 60 61 59 74 Manganese ppm ASTM D5185m 0 <1 0 <1 Magnesium ppm ASTM D5185m 1010 948 1037 901 Calcium ppm ASTM D5185m 1070 1005 1194 1012 Phosphorus ppm ASTM D5185m 1270 1259 1269 1226 Sulfur ppm ASTM D5185m 1270 1259 1269 1269 Sulfur ppm ASTM D5185m >2060 3319 <td>Copper</td> <td></td> <td>ASTM D5185m</td> <td>>330</td> <th><1</th> <td>3</td> <td>10</td>	Copper		ASTM D5185m	>330	<1	3	10
Vanadium ppm ASTM D5185m <1 0 0 Cadmium ppm ASTM D5185m <1 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 3 7 18 Barium ppm ASTM D5185m 0 0 0 0 Molybdenum ppm ASTM D5185m 0 60 61 59 74 Manganese ppm ASTM D5185m 0 <1 0 <1 Magnesium ppm ASTM D5185m 1070 1005 1194 1012 Phosphorus ppm ASTM D5185m 1150 1074 1076 963 Zinc ppm ASTM D5185m 1270 1259 1269 1226 Sulfur ppm ASTM D5185m 2060 3319 2673 2563 CONTAMINANTS method limit/base current <th< td=""><td>Γin</td><td>ppm</td><td>ASTM D5185m</td><td>>15</td><th><1</th><td>0</td><td><1</td></th<>	Γin	ppm	ASTM D5185m	>15	<1	0	<1
ADDITIVES	Vanadium		ASTM D5185m		<1	0	0
Boron ppm ASTM D5185m 0 0 0 0 0 0 0 0 0	Cadmium				<1	0	0
Barium ppm ASTM D5185m 0 0 0 0 Molybdenum ppm ASTM D5185m 60 61 59 74 Manganese ppm ASTM D5185m 0 <1 0 <1 Magnesium ppm ASTM D5185m 1010 948 1037 901 Calcium ppm ASTM D5185m 1070 1005 1194 1012 Phosphorus ppm ASTM D5185m 1150 1074 1076 963 Zinc ppm ASTM D5185m 1270 1259 1269 1226 Sulfur ppm ASTM D5185m 2060 3319 2673 2563 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 4 6 10 Sodium ppm ASTM D5185m >20 2 <1 102 INFRA-RED method limit/	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum ppm ASTM D5185m 60 61 59 74 Manganese ppm ASTM D5185m 0 <1 0 <1 Magnesium ppm ASTM D5185m 1010 948 1037 901 Calcium ppm ASTM D5185m 1070 1005 1194 1012 Phosphorus ppm ASTM D5185m 1150 1074 1076 963 Zinc ppm ASTM D5185m 1270 1259 1269 1226 Sulfur ppm ASTM D5185m 2060 3319 2673 2563 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 4 6 10 Sodium ppm ASTM D5185m >20 2 <1 102 INFRA-RED method limit/base current history1 history2 Soot % *ASTM D7844 >6	Boron	ppm	ASTM D5185m	0	3	7	18
Manganese ppm ASTM D5185m 0 <1 0 <1 Magnesium ppm ASTM D5185m 1010 948 1037 901 Calcium ppm ASTM D5185m 1070 1005 1194 1012 Phosphorus ppm ASTM D5185m 1150 1074 1076 963 Zinc ppm ASTM D5185m 1270 1259 1269 1226 Sulfur ppm ASTM D5185m 2060 3319 2673 2563 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 4 6 10 Sodium ppm ASTM D5185m >20 2 <1	Barium	ppm	ASTM D5185m	0	0	0	0
Magnesium ppm ASTM D5185m 1010 948 1037 901 Calcium ppm ASTM D5185m 1070 1005 1194 1012 Phosphorus ppm ASTM D5185m 1150 1074 1076 963 Zinc ppm ASTM D5185m 1270 1259 1269 1226 Sulfur ppm ASTM D5185m 2060 3319 2673 2563 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 4 6 10 Sodium ppm ASTM D5185m >20 2 <1	Molybdenum	ppm	ASTM D5185m	60	61	59	74
Calcium ppm ASTM D5185m 1070 1005 1194 1012 Phosphorus ppm ASTM D5185m 1150 1074 1076 963 Zinc ppm ASTM D5185m 1270 1259 1269 1226 Sulfur ppm ASTM D5185m 2060 3319 2673 2563 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 4 6 10 Sodium ppm ASTM D5185m >20 2 <1	Manganese	ppm	ASTM D5185m	0	<1	0	<1
Phosphorus ppm ASTM D5185m 1150 1074 1076 963 Zinc ppm ASTM D5185m 1270 1259 1269 1226 Sulfur ppm ASTM D5185m 2060 3319 2673 2563 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 4 6 10 Sodium ppm ASTM D5185m >20 2 <1	Magnesium	ppm	ASTM D5185m	1010	948	1037	901
Zinc ppm ASTM D5185m 1270 1259 1269 1226 Sulfur ppm ASTM D5185m 2060 3319 2673 2563 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 4 6 10 Sodium ppm ASTM D5185m 16 7 272 Potassium ppm ASTM D5185m >20 2 <1	Calcium	ppm	ASTM D5185m	1070	1005	1194	1012
Sulfur ppm ASTM D5185m 2060 3319 2673 2563 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 4 6 10 Sodium ppm ASTM D5185m >20 16 7 272 Potassium ppm ASTM D5185m >20 2 <1 102 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >6 0.3 0.8 0.7 Nitration Abs/cm *ASTM D7624 >20 5.4 11.8 11.4 Sulfation Abs/.1mm *ASTM D7415 >30 17.8 24.5 23.5 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 13.2 24.1 21.5	Phosphorus	ppm	ASTM D5185m	1150	1074	1076	963
CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 4 6 10 Sodium ppm ASTM D5185m 16 7 272 Potassium ppm ASTM D5185m >20 2 <1	Zinc	ppm	ASTM D5185m	1270	1259	1269	1226
Silicon ppm ASTM D5185m >25 4 6 10 Sodium ppm ASTM D5185m 16 7 272 Potassium ppm ASTM D5185m >20 2 <1 102 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >6 0.3 0.8 0.7 Nitration Abs/cm *ASTM D7624 >20 5.4 11.8 11.4 Sulfation Abs/.1mm *ASTM D7415 >30 17.8 24.5 23.5 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 13.2 24.1 21.5	Sulfur	ppm		2060	3319	2673	2563
Sodium ppm ASTM D5185m 16 7 272 Potassium ppm ASTM D5185m >20 2 <1	CONTAMINAN	ITS	method	limit/base	current	history1	history2
Potassium ppm ASTM D5185m >20 2 <1 ▲ 102 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >6 0.3 0.8 0.7 Nitration Abs/cm *ASTM D7624 >20 5.4 11.8 11.4 Sulfation Abs/.1mm *ASTM D7415 >30 17.8 24.5 23.5 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 13.2 24.1 21.5	Silicon	ppm	ASTM D5185m	>25	4	6	10
Potassium ppm ASTM D5185m >20 2 <1 ▲ 102 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >6 0.3 0.8 0.7 Nitration Abs/cm *ASTM D7624 >20 5.4 11.8 11.4 Sulfation Abs/.1mm *ASTM D7415 >30 17.8 24.5 23.5 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 13.2 24.1 21.5	Sodium	ppm	ASTM D5185m		16	7	272
Soot % % *ASTM D7844 >6 0.3 0.8 0.7 Nitration Abs/cm *ASTM D7624 >20 5.4 11.8 11.4 Sulfation Abs/.1mm *ASTM D7415 >30 17.8 24.5 23.5 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 13.2 24.1 21.5	Potassium	ppm	ASTM D5185m	>20		<1	<u>▲</u> 102
Nitration Abs/cm *ASTM D7624 >20 5.4 11.8 11.4 Sulfation Abs/.1mm *ASTM D7415 >30 17.8 24.5 23.5 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 13.2 24.1 21.5	INFRA-RED		method	limit/base	current	history1	history2
Nitration Abs/cm *ASTM D7624 >20 5.4 11.8 11.4 Sulfation Abs/.1mm *ASTM D7415 >30 17.8 24.5 23.5 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 13.2 24.1 21.5	Soot %	%	*ASTM D7844	>6	0.3	0.8	0.7
Sulfation Abs/.1mm *ASTM D7415 >30 17.8 24.5 23.5 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 13.2 24.1 21.5							
Oxidation							
	FLUID DEGRADATION method limit/base current history1 history2						
	Oxidation	Abs/.1mm	*ASTM D7414	>25	13.2	24.1	21.5



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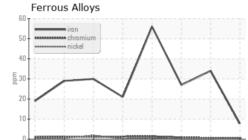


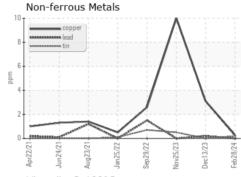


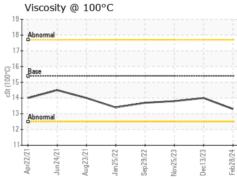
VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual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

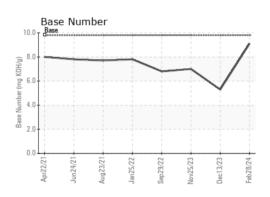
FLUID PROPI	ERTIES	method				history2
Visc @ 100°C	cSt	ASTM D445	15.4	13.3	14.0	13.8

GRAPHS













Certificate L2367

Laboratory Sample No.

: GFL0108821 Lab Number : 06105719 Unique Number : 10903949 Test Package : FLEET

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

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 Received : 01 Mar 2024 **Tested** : 01 Mar 2024

Diagnosed : 01 Mar 2024 - Wes Davis

GFL Environmental - 415 - Michigan East

6200 Elmridge Sterling Heights, MI US 48313

Contact: Frank Wolak fwolak@gflenv.com

T: (586)825-9514

* - 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)