

OIL ANALYSIS REPORT

(D582HW) 10681

Diesel Engine

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





DIAGNOSIS

Recommendation

Resample at the next service interval to monitor.

All component wear rates are normal.

Contamination

There is no indication of any contamination in the

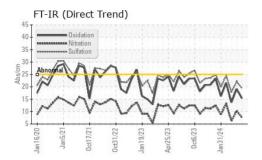
Fluid Condition

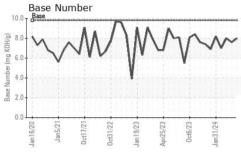
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

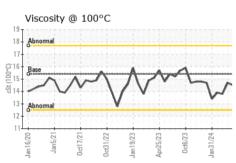
SAMPLE INFORMATION method limit/bass current history1 history2 Sample Number Cilent Info GFL0098891 GFL0099022 GFL0098876 Sample Date Cilent Info 15 Apr 2024 25 Mar 2024 12 Mar 202	GAL)		12020 Jan20	0ct2021 0ct2022	Jan2023 Apr2023 Oct2023	Jan 2024	
Sample Date	SAMPLE INFOR	RMATION	method	limit/base	current	history1	history2
Machine Age hrs Client Info 19504 19347 19082 Oil Age hrs Client Info 19347 18768 18768 Oil Changed Client Info N/A Changed N/A Sample Status Imitibase Current Inistoryt history2 Fuel WC Method >3.0 <1.0	Sample Number		Client Info		GFL0098891	GFL0099022	GFL0098876
Oil Age hrs Client Info 19347 18768 18768 Oil Changed Client Info N/A Changed N/A Sample Status NORMAL NORMAL NORMAL NORMAL CONTAMINATION method limit/base current history1 history2 Fuel WC Method 3.0 <1.0	Sample Date		Client Info		15 Apr 2024	25 Mar 2024	12 Mar 2024
Oil Changed Status Client Info N/A Changed NORMAL NORMAL NORMAL NORMAL NORMAL NORMAL NORMAL CONTAMINATION method limit/base current history2 Fuel WC Method >3.0 <1.0	Machine Age	hrs	Client Info		19504	19347	19082
Sample Status	Oil Age	hrs	Client Info		19347	18768	18768
CONTAMINATION method limit/base current history1 history2 Fuel WC Method >3.0 <1.0	Oil Changed		Client Info		N/A	Changed	N/A
Fuel WC Method >3.0 <1.0 <1.0 <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 DS185m >75 12 28 8 Chromium ppm ASTM DS185m >55 1 <1 0 Nickel ppm ASTM DS185m >55 1 <1 0 Nickel ppm ASTM DS185m >2 <1 <1 <1 Silver ppm ASTM DS185m >2 <1 0 0 Aluminum ppm ASTM DS185m >2 <1 0 0 Cadd ppm ASTM DS185m >2 1 0 0 Copper ppm ASTM DS185m >100 1 <1 <1 <	Sample Status				NORMAL	NORMAL	NORMAL
Water Glycol WC Method WC Method >0.2 NEG NEG NEG NEG NEG NEG WEAR METALS method Imitibase current current history1 history2 Iron ppm ASTM D5185m >75 12 28 8 Chromium ppm ASTM D5185m >5 1 <1	CONTAMINAT	ΓΙΟΝ	method	limit/base	current	history1	history2
WEAR METALS	Fuel		WC Method	>3.0	<1.0	<1.0	<1.0
WEAR METALS method limit/base current history2 Iron ppm ASTM D5185m >75 12 28 8 Chromium ppm ASTM D5185m >5 1 <1	Water		WC Method	>0.2	NEG	NEG	NEG
Iron	Glycol		WC Method		NEG	NEG	NEG
Chromium ppm ASTM D5185m >5 1 <1 0 Nickel ppm ASTM D5185m >4 1 <1	WEAR METAL	LS	method	limit/base	current	history1	history2
Nickel	Iron	ppm	ASTM D5185m	>75	12	28	8
Titanium	Chromium	ppm	ASTM D5185m	>5	1	<1	0
Silver	Nickel	ppm	ASTM D5185m	>4	1	<1	0
Aluminum	Titanium	ppm	ASTM D5185m	>2	<1	<1	<1
Lead ppm ASTM D5185m >25 1 0 0 Copper ppm ASTM D5185m >100 1 <1 <1 Tin ppm ASTM D5185m >4 1 0 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 <1 <1 6 Barium ppm ASTM D5185m 0 <1 <1 0 0 Manganese ppm ASTM D5185m 0 1 <1 <1 <1 Magnesium ppm ASTM D5185m 0 1 <1 <1 <1 Calcium ppm ASTM D5185m 1070 1051 1258 1106 Phosphorus ppm ASTM D5185m 1270 114	Silver	ppm	ASTM D5185m	>2	<1	0	0
Copper ppm ASTM D5185m >100 1 <1 <1 <1 Tin ppm ASTM D5185m >4 1 0 0 Vanadium ppm ASTM D5185m <1	Aluminum	ppm	ASTM D5185m	>15	2	2	2
Tin ppm ASTM D5185m >4 1 0 0 Vanadium ppm ASTM D5185m <1 <1 <1 <1 Cadmium ppm ASTM D5185m <1 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 <1 <1 6 Barium ppm ASTM D5185m 0 <1 0 0 Molybdenum ppm ASTM D5185m 0 <1 <1 0 0 Manganese 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 <1 <1 <1 <1 <1 <1 <1 <1 <1 </td <td>Lead</td> <td>ppm</td> <td>ASTM D5185m</td> <td>>25</td> <td>1</td> <td>0</td> <td>0</td>	Lead	ppm	ASTM D5185m	>25	1	0	0
Vanadium ppm ASTM D5185m <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 <1	Copper	ppm	ASTM D5185m	>100	1	<1	<1
Cadmium ppm ASTM D5185m <1 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 <1	Tin	ppm		>4	1	0	0
ADDITIVES	Vanadium	ppm	ASTM D5185m		<1	<1	<1
Boron	Cadmium	ppm	ASTM D5185m		<1	0	0
Barium ppm ASTM D5185m 0 <1 0 0 Molybdenum ppm ASTM D5185m 60 59 62 56 Manganese ppm ASTM D5185m 0 1 <1	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum ppm ASTM D5185m 60 59 62 56 Manganese ppm ASTM D5185m 0 1 <1 <1 Magnesium ppm ASTM D5185m 1010 880 1016 939 Calcium ppm ASTM D5185m 1070 1051 1258 1106 Phosphorus ppm ASTM D5185m 1150 937 1101 1003 Zinc ppm ASTM D5185m 1270 1143 1381 1268 Sulfur ppm ASTM D5185m 2060 3116 3842 3802 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 8 6 3 Sodium ppm ASTM D5185m >20 10 36 3 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844	Boron	ppm	ASTM D5185m	0	<1		
Manganese ppm ASTM D5185m 0 1 <1 <1 Magnesium ppm ASTM D5185m 1010 880 1016 939 Calcium ppm ASTM D5185m 1070 1051 1258 1106 Phosphorus ppm ASTM D5185m 1150 937 1101 1003 Zinc ppm ASTM D5185m 1270 1143 1381 1268 Sulfur ppm ASTM D5185m 2060 3116 3842 3802 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 8 6 3 Sodium ppm ASTM D5185m >20 10 36 3 Potassium ppm ASTM D5185m >20 10 36 3 INFRA-RED method limit/base current history1 history2 Soot % % ASTM D7624 >	Barium	ppm		0			-
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Calcium ppm ASTM D5185m 1070 1051 1258 1106 Phosphorus ppm ASTM D5185m 1150 937 1101 1003 Zinc ppm ASTM D5185m 1270 1143 1381 1268 Sulfur ppm ASTM D5185m 2060 3116 3842 3802 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 8 6 3 Sodium ppm ASTM D5185m >20 10 36 3 Potassium ppm ASTM D5185m >20 10 36 3 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7624 >20 7.6 10.3 6.2 Sulfation Abs/.1mm *ASTM D7415 >30 19.4 22.1 17.8 FLUID DEGRADATION	-	ppm					
Phosphorus ppm ASTM D5185m 1150 937 1101 1003 Zinc ppm ASTM D5185m 1270 1143 1381 1268 Sulfur ppm ASTM D5185m 2060 3116 3842 3802 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 8 6 3 Sodium ppm ASTM D5185m >25 8 6 3 Potassium ppm ASTM D5185m >20 10 36 3 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >6 0.4 0.6 0.1 Nitration Abs/.1mm *ASTM D7624 >20 7.6 10.3 6.2 Sulfation Abs/.1mm *ASTM D7415 >30 19.4 22.1 17.8 FLUID DEGRADATION	-	ppm					
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Sulfur ppm ASTM D5185m 2060 3116 3842 3802 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 8 6 3 Sodium ppm ASTM D5185m >25 14 42 3 Potassium ppm ASTM D5185m >20 10 36 3 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >6 0.4 0.6 0.1 Nitration Abs/cm *ASTM D7624 >20 7.6 10.3 6.2 Sulfation Abs/.1mm *ASTM D7415 >30 19.4 22.1 17.8 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 15.4 19.1 13.7							
CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 8 6 3 Sodium ppm ASTM D5185m >20 14 42 3 Potassium ppm ASTM D5185m >20 10 36 3 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >6 0.4 0.6 0.1 Nitration Abs/cm *ASTM D7624 >20 7.6 10.3 6.2 Sulfation Abs/.1mm *ASTM D7415 >30 19.4 22.1 17.8 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 15.4 19.1 13.7					_		
Silicon ppm ASTM D5185m >25 8 6 3 Sodium ppm ASTM D5185m 14 42 3 Potassium ppm ASTM D5185m >20 10 36 3 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >6 0.4 0.6 0.1 Nitration Abs/cm *ASTM D7624 >20 7.6 10.3 6.2 Sulfation Abs/.1mm *ASTM D7415 >30 19.4 22.1 17.8 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 15.4 19.1 13.7			ASTM D5185m	2060	3116	3842	3802
Sodium ppm ASTM D5185m 14 42 3 Potassium ppm ASTM D5185m >20 10 36 3 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >6 0.4 0.6 0.1 Nitration Abs/cm *ASTM D7624 >20 7.6 10.3 6.2 Sulfation Abs/.1mm *ASTM D7415 >30 19.4 22.1 17.8 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 15.4 19.1 13.7		NTS	method	limit/base	current	history1	
Potassium ppm ASTM D5185m >20 10 36 3 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >6 0.4 0.6 0.1 Nitration Abs/cm *ASTM D7624 >20 7.6 10.3 6.2 Sulfation Abs/.1mm *ASTM D7415 >30 19.4 22.1 17.8 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 15.4 19.1 13.7				>25			
INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >6 0.4 0.6 0.1 Nitration Abs/cm *ASTM D7624 >20 7.6 10.3 6.2 Sulfation Abs/.1mm *ASTM D7415 >30 19.4 22.1 17.8 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 15.4 19.1 13.7		ppm					
Soot % % *ASTM D7844 >6 0.4 0.6 0.1 Nitration Abs/cm *ASTM D7624 >20 7.6 10.3 6.2 Sulfation Abs/.1mm *ASTM D7415 >30 19.4 22.1 17.8 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 15.4 19.1 13.7	Potassium	ppm	ASTM D5185m	>20	10	36	3
Nitration Abs/cm *ASTM D7624 >20 7.6 10.3 6.2 Sulfation Abs/.1mm *ASTM D7415 >30 19.4 22.1 17.8 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 15.4 19.1 13.7	INFRA-RED		method	limit/base	current	history1	history2
Sulfation Abs/.1mm *ASTM D7415 >30 19.4 22.1 17.8 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 15.4 19.1 13.7	Soot %	%	*ASTM D7844	>6	0.4		
FLUID DEGRADATIONmethodlimit/basecurrenthistory1history2OxidationAbs/.1mm*ASTM D7414>2515.419.113.7	Nitration	Abs/cm	*ASTM D7624	>20	7.6	10.3	6.2
Oxidation Abs/.1mm *ASTM D7414 >25 15.4 19.1 13.7	Sulfation	Abs/.1mm	*ASTM D7415	>30	19.4	22.1	17.8
	FLUID DEGRA	DATION	method	limit/base	current	history1	history2
Base Number (BN) mg KOH/g ASTM D2896 9.8 8.0 7.6 8.0	Oxidation	Abs/.1mm	*ASTM D7414	>25	15.4	19.1	13.7
	Base Number (BN)	mg KOH/g	ASTM D2896	9.8	8.0	7.6	8.0



OIL ANALYSIS REPORT



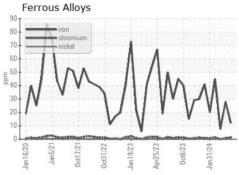


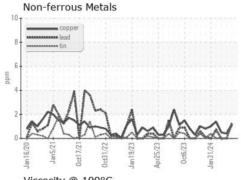


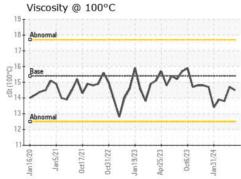
VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual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

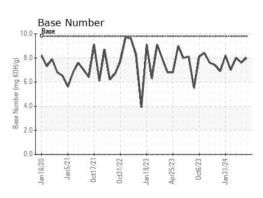
FLUID PROPERTIES		method				history2
Visc @ 100°C	cSt	ASTM D445	15.4	14.5	14.7	13.8

GRAPHS













Certificate 12367

Laboratory Sample No.

Lab Number : 06160205

: GFL0098891 Unique Number : 10995628 Test Package : FLEET

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 Received : 25 Apr 2024

Tested : 26 Apr 2024 Diagnosed

: 26 Apr 2024 - Wes Davis

US 37042

GFL Environmental - 084 - Clarksville

Contact: ROBERT THIBAULT robert.thibault@gflenv.com

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699 Jack Miller Boulevard

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: GFL084 [WUSCAR] 06160205 (Generated: 04/26/2024 10:51:08) Rev: 1

Submitted By: GFL084,GFL842,GFL844,GFL846 - ROBERT THIBAULT

Clarksville, TN