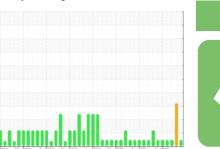


OIL ANALYSIS REPORT

Sample Rating Trend









Machine Id 2421 MACK GU713

Component
Diesel Engine

PETRO CANADA DURON SHP 15W40 (48 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.

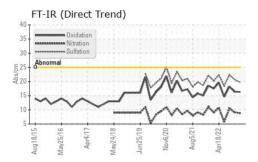
Fluid Condition

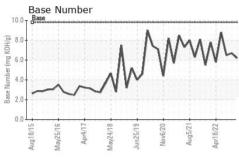
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

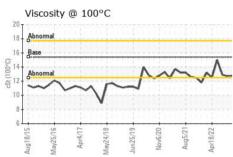
Sample Number Client Info GFL0117516 GFL0094723 GFL0052413 Sample Date Client Info 12 Apr 2024 22 Nov 2023 13 Jul 2022 Machine Age hrs Client Info 0 300 623 Oil Age hrs Client Info Not Changd Changed Changed Oil Changed Client Info Not Changd Changed Changed Sample Status NorMAL ABNORMAL ABNORMAL NORMAL CONTAMINATION method limit/base current history1 history2 Fuel WC Method >3.0 <1.0	SAMPLE INFORM	IATION	method	limit/base	current	history1	history2
Sample Date Client Info 12 Apr 2024 22 Nov 2023 13 Jul 2022					GFL0117516	GEL 0094723	
Machine Age hrs Client Info 28374 27838 26119 Oil Age hrs Client Info 0 300 623 Oil Changed Client Info Not Changed Changed Changed Sample Status NoRMAL ABNORMAL NORMAL CONTAMINATION method Ilmit/base current history1 history2 Fuel WC Method >3.0 <1.0							
Oil Age hrs Client Info Not Changd Ason Changed NoRMAL Abnormal NoRMAL Abnormal NoRMAL Abnormal NoRMAL Abnormal NoRMAL NoRMAL		hre			•		
Colient Info							
CONTAMINATION	-	1110			· ·		
Fuel	-		Olichi iilio			_	_
Fuel		NC	method	limit/hase			
Water Glycol WC Method WC Method >0.2 NEG NEG NEG NEG NEG NEG WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >120 8 11 9 Chromium ppm ASTM D5185m >20 <1		J1 1					
Glycol WC Method NEG NEG NEG WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >120 8 11 9 Chromium ppm ASTM D5185m >20 <1							
WEAR METALS				>0.2			
Irron					NEG		
Chromium ppm ASTM D5185m >20 <1 <1 <1 Nickel ppm ASTM D5185m >5 4 6 <1	WEAR METALS	;	method	limit/base	current	history1	history2
Nickel	Iron	ppm	ASTM D5185m	>120		11	9
Description	Chromium	ppm	ASTM D5185m	>20	<1	<1	<1
Silver	Nickel	ppm	ASTM D5185m	>5	4	<u>6</u>	<1
Aluminum ppm ASTM D5185m >20 2 5 2 Lead ppm ASTM D5185m >40 1 <1	Titanium	ppm	ASTM D5185m	>2	<1	<1	0
Lead ppm ASTM D5185m >40 1 <1 <1 <1 Copper ppm ASTM D5185m >330 10 85 <1 Tin ppm ASTM D5185m >15 3 2 1 Vanadium ppm ASTM D5185m 0 0 0 0 Cadmium ppm ASTM D5185m 0 <1 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 <1 1 3 Barium ppm ASTM D5185m 0 <1 1 3 Barium ppm ASTM D5185m 0 <1 <1 <1 <1 Barium ppm ASTM D5185m 0 <1 <1 <1 <1 Barium ppm ASTM D5185m 0 <1 <1 <1 <1 Magnesium ppm ASTM D51	Silver	ppm	ASTM D5185m	>2	0	0	<1
Copper ppm ASTM D5185m >330 10 85 <1 Tin ppm ASTM D5185m >15 3 2 1 Vanadium ppm ASTM D5185m 0 0 0 0 Cadmium ppm ASTM D5185m 0 -1 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 -1 1 3 Barium ppm ASTM D5185m 0 -1 1 3 Barium ppm ASTM D5185m 0 -1 -1 -1 -1 Manganese ppm ASTM D5185m 0 -1 -1 -1 -1 Magnesium ppm ASTM D5185m 1010 936 881 886 Calcium ppm ASTM D5185m 1070 1150 1072 1111 Phosphorus ppm ASTM D5185m	Aluminum	ppm	ASTM D5185m	>20	2	5	2
Tin	Lead	ppm	ASTM D5185m	>40	1	<1	<1
Vanadium ppm ASTM D5185m 0 0 0 Cadmium ppm ASTM D5185m <1 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 <1 1 3 Barium ppm ASTM D5185m 0 0 0 0 0 Molybdenum ppm ASTM D5185m 0 0 0 0 0 Manganese ppm ASTM D5185m 0 <1 <1 <1 <1 Magnesium ppm ASTM D5185m 1010 936 881 886 Calcium ppm ASTM D5185m 1070 1150 1072 1111 Phosphorus ppm ASTM D5185m 1270 1197 1151 1169 Sulfur ppm ASTM D5185m 1270 1197 1151 1169 Sulfur ppm ASTM D5	Copper	ppm	ASTM D5185m	>330	10	85	<1
Cadmium ppm ASTM D5185m <1 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 <1	Tin	ppm	ASTM D5185m	>15	3	2	1
ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 <1	Vanadium	ppm	ASTM D5185m		0	0	0
Boron ppm ASTM D5185m 0 <1 1 3 Barium ppm ASTM D5185m 0 0 0 0 Molybdenum ppm ASTM D5185m 60 63 63 56 Manganese ppm ASTM D5185m 0 <1 <1 <1 Magnesium ppm ASTM D5185m 1010 936 881 886 Calcium ppm ASTM D5185m 1070 1150 1072 1111 Phosphorus ppm ASTM D5185m 1270 1197 1151 1169 Zinc ppm ASTM D5185m 2060 3105 2952 3438 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 8 11 3 Sodium ppm ASTM D5185m >20 13 137 0 INFRA-RED method limit/base	Cadmium	ppm	ASTM D5185m		<1	0	0
Barium ppm ASTM D5185m 0 0 0 0 Molybdenum ppm ASTM D5185m 60 63 63 56 Manganese ppm ASTM D5185m 0 <1 <1 <1 Magnesium ppm ASTM D5185m 1010 936 881 886 Calcium ppm ASTM D5185m 1070 1150 1072 1111 Phosphorus ppm ASTM D5185m 1150 1041 895 906 Zinc ppm ASTM D5185m 1270 1197 1151 1169 Sulfur ppm ASTM D5185m 2060 3105 2952 3438 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 8 11 3 Sodium ppm ASTM D5185m >20 13 137 0 INFRA-RED method limit/b	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum ppm ASTM D5185m 60 63 63 56 Manganese ppm ASTM D5185m 0 <1 <1 <1 Magnesium ppm ASTM D5185m 1010 936 881 886 Calcium ppm ASTM D5185m 1070 1150 1072 1111 Phosphorus ppm ASTM D5185m 1150 1041 895 906 Zinc ppm ASTM D5185m 1270 1197 1151 1169 Sulfur ppm ASTM D5185m 2060 3105 2952 3438 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 8 11 3 Sodium ppm ASTM D5185m >20 13 137 0 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844	Boron	ppm	ASTM D5185m	0	<1	1	3
Manganese ppm ASTM D5185m 0 <1 <1 <1 Magnesium ppm ASTM D5185m 1010 936 881 886 Calcium ppm ASTM D5185m 1070 1150 1072 1111 Phosphorus ppm ASTM D5185m 1150 1041 895 906 Zinc ppm ASTM D5185m 1270 1197 1151 1169 Sulfur ppm ASTM D5185m 2060 3105 2952 3438 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 8 11 3 Sodium ppm ASTM D5185m >20 13 137 0 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7624 >20 8.8 9.1 10.5 Sulfation Abs/:mm *	Barium	ppm	ASTM D5185m	0	0	0	0
Magnesium ppm ASTM D5185m 1010 936 881 886 Calcium ppm ASTM D5185m 1070 1150 1072 1111 Phosphorus ppm ASTM D5185m 1150 1041 895 906 Zinc ppm ASTM D5185m 1270 1197 1151 1169 Sulfur ppm ASTM D5185m 2060 3105 2952 3438 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 8 11 3 Sodium ppm ASTM D5185m >20 13 137 0 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >4 0.5 0.6 0.4 Nitration Abs/cm *ASTM D7415 >30 19.7 20.7 22.3 FLUID DEGRADATION method <	Molybdenum	ppm	ASTM D5185m	60	63	63	56
Calcium ppm ASTM D5185m 1070 1150 1072 1111 Phosphorus ppm ASTM D5185m 1150 1041 895 906 Zinc ppm ASTM D5185m 1270 1197 1151 1169 Sulfur ppm ASTM D5185m 2060 3105 2952 3438 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 8 11 3 Sodium ppm ASTM D5185m 6 6 68 5 Potassium ppm ASTM D5185m >20 13 137 0 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >4 0.5 0.6 0.4 Nitration Abs/cm *ASTM D7415 >30 19.7 20.7 22.3 FLUID DEGRADATION metho	Manganese	ppm	ASTM D5185m	0	<1	<1	<1
Phosphorus ppm ASTM D5185m 1150 1041 895 906 Zinc ppm ASTM D5185m 1270 1197 1151 1169 Sulfur ppm ASTM D5185m 2060 3105 2952 3438 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 8 11 3 Sodium ppm ASTM D5185m >20 13 137 0 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >4 0.5 0.6 0.4 Nitration Abs/cm *ASTM D7624 >20 8.8 9.1 10.5 Sulfation Abs/.1mm *ASTM D7415 >30 19.7 20.7 22.3 FLUID DEGRADATION method limit/base current history1 history2 Oxidation <td< td=""><td>Magnesium</td><td>ppm</td><td>ASTM D5185m</td><td>1010</td><th>936</th><td>881</td><td>886</td></td<>	Magnesium	ppm	ASTM D5185m	1010	936	881	886
Zinc ppm ASTM D5185m 1270 1197 1151 1169 Sulfur ppm ASTM D5185m 2060 3105 2952 3438 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 8 11 3 Sodium ppm ASTM D5185m 6 6 68 5 Potassium ppm ASTM D5185m >20 13 137 0 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >4 0.5 0.6 0.4 Nitration Abs/cm *ASTM D7624 >20 8.8 9.1 10.5 Sulfation Abs/.1mm *ASTM D7415 >30 19.7 20.7 22.3 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm<	Calcium	ppm	ASTM D5185m	1070	1150	1072	1111
Sulfur ppm ASTM D5185m 2060 3105 2952 3438 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 8 11 3 Sodium ppm ASTM D5185m 6 6 68 5 Potassium ppm ASTM D5185m >20 13 137 0 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >4 0.5 0.6 0.4 Nitration Abs/cm *ASTM D7624 >20 8.8 9.1 10.5 Sulfation Abs/.1mm *ASTM D7415 >30 19.7 20.7 22.3 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 16.3 16.4 18.2	Phosphorus	ppm	ASTM D5185m	1150	1041	895	906
CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 8 11 3 Sodium ppm ASTM D5185m 6 △ 68 5 Potassium ppm ASTM D5185m >20 13 △ 137 0 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >4 0.5 0.6 0.4 Nitration Abs/cm *ASTM D7624 >20 8.8 9.1 10.5 Sulfation Abs/.1mm *ASTM D7415 >30 19.7 20.7 22.3 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 16.3 16.4 18.2	Zinc	ppm	ASTM D5185m	1270	1197	1151	1169
Silicon ppm ASTM D5185m >25 8 11 3 Sodium ppm ASTM D5185m 6 △ 68 5 Potassium ppm ASTM D5185m >20 13 △ 137 0 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >4 0.5 0.6 0.4 Nitration Abs/cm *ASTM D7624 >20 8.8 9.1 10.5 Sulfation Abs/.1mm *ASTM D7415 >30 19.7 20.7 22.3 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 16.3 16.4 18.2	Sulfur	ppm	ASTM D5185m	2060	3105	2952	3438
Sodium ppm ASTM D5185m 6 △ 68 5 Potassium ppm ASTM D5185m >20 13 △ 137 0 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >4 0.5 0.6 0.4 Nitration Abs/cm *ASTM D7624 >20 8.8 9.1 10.5 Sulfation Abs/.1mm *ASTM D7415 >30 19.7 20.7 22.3 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 16.3 16.4 18.2	CONTAMINANT	S	method	limit/base	current	history1	history2
Potassium ppm ASTM D5185m >20 13 ▲ 137 0 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >4 0.5 0.6 0.4 Nitration Abs/cm *ASTM D7624 >20 8.8 9.1 10.5 Sulfation Abs/.1mm *ASTM D7415 >30 19.7 20.7 22.3 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 16.3 16.4 18.2	Silicon	ppm	ASTM D5185m	>25	8	11	3
INFRA-RED	Sodium	ppm	ASTM D5185m		6	△ 68	5
Soot % % *ASTM D7844 >4 0.5 0.6 0.4 Nitration Abs/cm *ASTM D7624 >20 8.8 9.1 10.5 Sulfation Abs/.1mm *ASTM D7415 >30 19.7 20.7 22.3 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 16.3 16.4 18.2	Potassium	ppm	ASTM D5185m	>20	13	△ 137	0
Nitration Abs/cm *ASTM D7624 >20 8.8 9.1 10.5 Sulfation Abs/.1mm *ASTM D7415 >30 19.7 20.7 22.3 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 16.3 16.4 18.2	INFRA-RED		method	limit/base	current	history1	history2
Nitration Abs/cm *ASTM D7624 >20 8.8 9.1 10.5 Sulfation Abs/.1mm *ASTM D7415 >30 19.7 20.7 22.3 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 16.3 16.4 18.2	Soot %	%	*ASTM D7844	>4	0.5	0.6	0.4
Sulfation Abs/.1mm *ASTM D7415 >30 19.7 20.7 22.3 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 16.3 16.4 18.2							
Oxidation Abs/.1mm *ASTM D7414 >25 16.3 16.4 18.2							
	FLUID DEGRADA	ATION	method	limit/base	current	history1	history2
	Oxidation	Abs/.1mm	*ASTM D7414	>25	16.3	16.4	18.2



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 PROPI	ERTIES	method				history2
Visc @ 100°C	cSt	ASTM D445	15.4	12.8	12.7	12.9

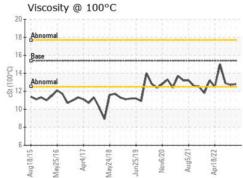
GRAPHS

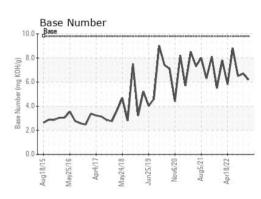
Ferrous Alloys



Non-ferrous Metals

20









Certificate 12367

Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513 Sample No. Lab Number : 06148412

: GFL0117516 Unique Number : 10978490 Test Package : FLEET

Received : 15 Apr 2024 **Tested** : 16 Apr 2024 Diagnosed

: 16 Apr 2024 - Wes Davis

GFL Environmental - 001 - Raleigh(CNG)

3741 Conquest Drive Garner, NC US 27529

Contact: Craig Johnson craig.johnson@gflenv.com T: (919)662-7100

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)

F: (919)662-7130