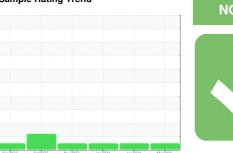


OIL ANALYSIS REPORT

Sample Rating Trend







Mack 91 Com Die Fluid PET

Machine Id 913009 Component Diesel Engine Fluid

PETRO CANADA DURON SHP 15W40 (36 QTS)

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

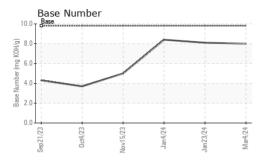
Fluid Condition

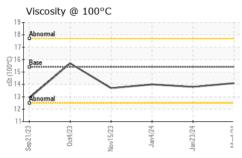
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

Client Info	N SHP 15W40 (3	6 Q (S)	Sep 2023	0ct2023 Nov2023	Jan2024 Jan2024	Mar2024	
Client Info	SAMPLE INFORI	MATION	method	limit/base	current	history1	history2
Machine Age hrs Client Info 4251 3375 3635 Oil Age hrs Client Info 600 600 3050 Oil Changed Client Info 600 600 3050 Oil Changed Changed Changed N/A Sample Status NORMAL NORMAL NORMAL OCONTAMINATION method Imitibase current history1 history2 Fuel WC Method >3.0 <1.0 <1.0 <1.0 <1.0 Water WC Method >0.2 NEG NEG NEG NEG Glycol WC Method MEG NEG NEG NEG NEG Glycol WC Method Imitibase current history1 history2 Iron ppm ASTM 05165m >20 0 <1 0 Nickel ppm ASTM 05165m >20 0 <1 0 Nickel ppm ASTM 05165m >20 0 <1 0 Aluminum ppm ASTM 05165m >20 0 <1 0 Aluminum ppm ASTM 05165m >20 1 1 0 Aluminum ppm ASTM 05165m >40 0 0 <1 0 Aluminum ppm ASTM 05165m >40 0 0 <1 0 Aluminum ppm ASTM 05165m >40 0 0 0 <1 0 ADDITIVES method Imitibase current history1 history2 ADDITIVES method Imitibase current history1 history2 history2 history2 history2 history2 history2 history3 history	Sample Number		Client Info		GFL0104362	GFL0110058	GFL0104188
Oil Age	Sample Date		Client Info		04 Mar 2024	23 Jan 2024	04 Jan 2024
Cilichanged Cilicht Info NORMAL NORMAL NORMAL NORMAL	Machine Age	hrs	Client Info		4251	3375	3635
NORMAL NORMAL NORMAL CONTAMINATION method minit/base current history1 history2	Oil Age	hrs	Client Info		600	600	3050
CONTAMINATION	Oil Changed		Client Info		Changed	Changed	N/A
Fuel	Sample Status				NORMAL	NORMAL	NORMAL
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 D5185m >120 7 7 2 Chromium ppm ASTM D5185m >20 0 -1 0 Nickel ppm ASTM D5185m >5 <1	CONTAMINAT	ION	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 history1 history2 Iron ppm ASTM D5185m >120 7 7 2 Chromium ppm ASTM D5185m >20 0 <1	Water		WC Method	>0.2	NEG	NEG	NEG
Chromium	Glycol		WC Method		NEG	NEG	NEG
Chromium	WEAR METAL	S	method	limit/base	current	history1	history2
Chromium	Iron	ppm	ASTM D5185m	>120	7	7	2
Titanium	Chromium		ASTM D5185m	>20	0	<1	0
Description	Nickel				<1	4	0
Silver	Titanium		ASTM D5185m	>2	0	0	0
Aluminum	Silver				0	<1	0
Lead	Aluminum		ASTM D5185m	>20	1	1	0
Copper	Lead		ASTM D5185m	>40	0	0	<1
Standard	Copper		ASTM D5185m	>330	<1	<1	<1
Vanadium ppm ASTM D5185m 0 0 0 Cadmium ppm ASTM D5185m 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 0 1 <1 Barium ppm ASTM D5185m 0 0 <1 0 Molybdenum ppm ASTM D5185m 0 0 <1 0 Manganese ppm ASTM D5185m 0 0 <1 0 Magnesium ppm ASTM D5185m 1010 935 844 924 Calcium ppm ASTM D5185m 1070 990 913 984 Phosphorus ppm ASTM D5185m 1270 1206 1117 1251 Sulfur ppm ASTM D5185m 2060 2851 2593 2910 CONTAMINANTS method limit/base current history1				>15	0	<1	0
ADDITIVES	Vanadium		ASTM D5185m		0	0	0
Boron ppm ASTM D5185m 0 0 0 1 0 0 0 0	Cadmium					0	0
Barium ppm ASTM D5185m 0 0 <1	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum ppm ASTM D5185m 60 57 54 53 Manganese ppm ASTM D5185m 0 0 <1 0 Magnesium ppm ASTM D5185m 1010 935 844 924 Calcium ppm ASTM D5185m 1070 990 913 984 Phosphorus ppm ASTM D5185m 1150 1033 914 945 Zinc ppm ASTM D5185m 1270 1206 1117 1251 Sulfur ppm ASTM D5185m 2060 2851 2593 2910 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 3 3 2 Sodium ppm ASTM D5185m >20 0 2 <1 INFRA-RED method limit/base current history1 history2 Soot % *ASTM D7844 >4	Boron	ppm	ASTM D5185m	0	0	1	<1
Manganese ppm ASTM D5185m 0 0 <1 0 Magnesium ppm ASTM D5185m 1010 935 844 924 Calcium ppm ASTM D5185m 1070 990 913 984 Phosphorus ppm ASTM D5185m 1150 1033 914 945 Zinc ppm ASTM D5185m 1270 1206 1117 1251 Sulfur ppm ASTM D5185m 2060 2851 2593 2910 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 3 3 2 Sodium ppm ASTM D5185m 2 3 <1	Barium	ppm	ASTM D5185m	0	0	<1	0
Magnesium ppm ASTM D5185m 1010 935 844 924 Calcium ppm ASTM D5185m 1070 990 913 984 Phosphorus ppm ASTM D5185m 1150 1033 914 945 Zinc ppm ASTM D5185m 1270 1206 1117 1251 Sulfur ppm ASTM D5185m 2060 2851 2593 2910 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 3 3 2 Sodium ppm ASTM D5185m >20 0 2 <1	Molybdenum	ppm	ASTM D5185m	60	57	54	53
Calcium ppm ASTM D5185m 1070 990 913 984 Phosphorus ppm ASTM D5185m 1150 1033 914 945 Zinc ppm ASTM D5185m 1270 1206 1117 1251 Sulfur ppm ASTM D5185m 2060 2851 2593 2910 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 3 3 2 Sodium ppm ASTM D5185m 20 0 2 <1	Manganese	ppm	ASTM D5185m	0	0	<1	0
Phosphorus ppm ASTM D5185m 1150 1033 914 945 Zinc ppm ASTM D5185m 1270 1206 1117 1251 Sulfur ppm ASTM D5185m 2060 2851 2593 2910 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 3 3 2 Sodium ppm ASTM D5185m 2 3 <1	Magnesium	ppm	ASTM D5185m	1010	935	844	924
Zinc ppm ASTM D5185m 1270 1206 1117 1251 Sulfur ppm ASTM D5185m 2060 2851 2593 2910 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 3 3 2 Sodium ppm ASTM D5185m 2 3 <1 Potassium ppm ASTM D5185m >20 0 2 <1 INFRA-RED method limit/base current history1 history2 Soot % *ASTM D7844 >4 0.3 0.3 0.2 Nitration Abs/cm *ASTM D7624 >20 6.5 6.9 5.7 Sulfation Abs/.1mm *ASTM D7415 >30 18.6 18.9 18.3 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 14.8 14.6 14.1	Calcium	ppm	ASTM D5185m	1070	990	913	984
Sulfur ppm ASTM D5185m 2060 2851 2593 2910 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 3 3 2 Sodium ppm ASTM D5185m 2 3 <1	Phosphorus	ppm	ASTM D5185m	1150	1033	914	945
CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 3 3 2 Sodium ppm ASTM D5185m 2 3 <1	Zinc	ppm	ASTM D5185m	1270	1206	1117	1251
Silicon ppm ASTM D5185m >25 3 3 2 Sodium ppm ASTM D5185m 2 3 <1 Potassium ppm ASTM D5185m >20 0 2 <1 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >4 0.3 0.3 0.2 Nitration Abs/cm *ASTM D7624 >20 6.5 6.9 5.7 Sulfation Abs/.1mm *ASTM D7415 >30 18.6 18.9 18.3 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 14.8 14.6 14.1	Sulfur	ppm	ASTM D5185m	2060	2851	2593	2910
Sodium ppm ASTM D5185m 2 3 <1 Potassium ppm ASTM D5185m >20 0 2 <1	CONTAMINAN	ITS	method	limit/base	current	history1	history2
Potassium ppm ASTM D5185m >20 0 2 <1 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >4 0.3 0.3 0.2 Nitration Abs/cm *ASTM D7624 >20 6.5 6.9 5.7 Sulfation Abs/.1mm *ASTM D7415 >30 18.6 18.9 18.3 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 14.8 14.6 14.1	Silicon	ppm	ASTM D5185m	>25	3	3	2
INFRA-RED	Sodium		ASTM D5185m		2	3	<1
Soot % % *ASTM D7844 >4 0.3 0.3 0.2 Nitration Abs/cm *ASTM D7624 >20 6.5 6.9 5.7 Sulfation Abs/.1mm *ASTM D7415 >30 18.6 18.9 18.3 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 14.8 14.6 14.1	Potassium	ppm	ASTM D5185m	>20	0	2	<1
Nitration Abs/cm *ASTM D7624 >20 6.5 6.9 5.7 Sulfation Abs/.1mm *ASTM D7415 >30 18.6 18.9 18.3 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 14.8 14.6 14.1	INFRA-RED		method	limit/base	current	history1	history2
Nitration Abs/cm *ASTM D7624 >20 6.5 6.9 5.7 Sulfation Abs/.1mm *ASTM D7415 >30 18.6 18.9 18.3 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 14.8 14.6 14.1	Soot %	%	*ASTM D7844	>4	0.3	0.3	0.2
Sulfation Abs/.1mm *ASTM D7415 >30 18.6 18.9 18.3 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 14.8 14.6 14.1							
Oxidation							
	FLUID DEGRA	OATION	method	limit/base	current	history1	history2
	Oxidation	Abs/.1mm	*ASTM D7414	>25	14.8	14.6	14.1
	Base Number (BN)	mg KOH/g			8.0	8.1	8.4



OIL ANALYSIS REPORT

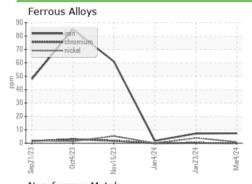


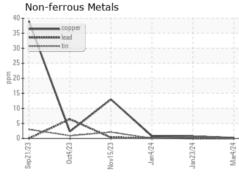


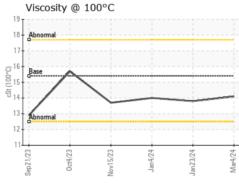
VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual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

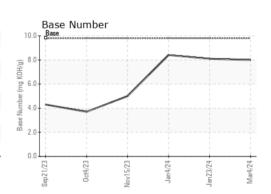
FLUID PROPI	ERTIES	method				history2
Visc @ 100°C	cSt	ASTM D445	15.4	14.1	13.8	14.0

GRAPHS













Certificate L2367

Laboratory Sample No. Lab Number : 06109902

Test Package : FLEET

: GFL0104362 Unique Number: 10913399

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

Tested Diagnosed

: 07 Mar 2024 : 07 Mar 2024 - Wes Davis

: 06 Mar 2024

GFL Environmental - 410 - Michigan West 39000 Van Born Rd Wayne, MI

US 48184 Contact: Tony Esquina

tesquina@gflenv.com

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: GFL410 [WUSCAR] 06109902 (Generated: 03/07/2024 09:37:52) Rev: 1

Submitted By: seel also GFL468 - Laura Wilson

T:

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