

OIL ANALYSIS REPORT

Sample Rating Trend



Machine Id 713048

Component Diesel Engine

Fluid 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.

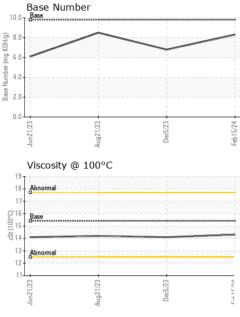
Fluid Condition

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

·	Junž023 Augž023 Dec2023 Feb2024								
SAMPLE INFOR	MATION	method	limit/base	current	history1	history2			
Sample Number		Client Info		GFL0112980	GFL0098431	GFL0089479			
Sample Date		Client Info		15 Feb 2024	05 Dec 2023	21 Aug 2023			
Machine Age	hrs	Client Info		3161	2715	2087			
Oil Age	hrs	Client Info		3161	2715	0			
•	1113								
Oil Changed		Client Info		Changed	Changed	Changed			
Sample Status				NORMAL	NORMAL	NORMAL			
CONTAMINAT	ION	method	limit/base	current	history1	history2			
Fuel		WC Method	>5	<1.0	<1.0	<1.0			
Water		WC Method	>0.2	NEG	NEG	NEG			
Glycol		WC Method		NEG	NEG	NEG			
-	0			-					
WEAR METAL	5	method	limit/base	current	history1	history2			
Iron	ppm	ASTM D5185m	>100	5	10	8			
Chromium	ppm	ASTM D5185m	>20	<1	<1	<1			
Nickel	ppm	ASTM D5185m	>4	0	<1	0			
Titanium	ppm	ASTM D5185m		0	<1	0			
Silver	ppm	ASTM D5185m	>3	0	0	0			
Aluminum	ppm	ASTM D5185m	>20	1	2	4			
Lead			>40	0	0	0			
	ppm	ASTM D5185m		-					
Copper	ppm	ASTM D5185m	>330	<1	1	<1			
Tin	ppm	ASTM D5185m	>15	<1	<1	<1			
Vanadium	ppm	ASTM D5185m		0	0	0			
Cadmium	ppm	ASTM D5185m		0	<1	0			
ADDITIVES		method	limit/base	current	history1	history2			
	ppm	method ASTM D5185m	limit/base	current 3	history1 0	history2 <1			
ADDITIVES			0						
ADDITIVES Boron	ppm	ASTM D5185m	0	3	0	<1			
ADDITIVES Boron Barium	ppm ppm	ASTM D5185m ASTM D5185m	0	3 3	0 12	<1 0			
ADDITIVES Boron Barium Molybdenum Manganese	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60	3 3 60 0	0 12 60 <1	<1 0 63			
ADDITIVES Boron Barium Molybdenum Manganese Magnesium	ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010	3 3 60 0 899	0 12 60 <1 949	<1 0 63 <1 1043			
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium	ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010 1070	3 3 60 0 899 1033	0 12 60 <1 949 1037	<1 0 63 <1 1043 1148			
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus	ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010 1070 1150	3 3 60 0 899 1033 1037	0 12 60 <1 949 1037 985	<1 0 63 <1 1043 1148 1142			
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc	ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010 1070 1150 1270	3 3 60 0 899 1033 1037 1156	0 12 60 <1 949 1037 985 1239	<1 0 63 <1 1043 1148 1142 1388			
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur	ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010 1070 1150 1270 2060	3 3 60 0 899 1033 1037 1156 3315	0 12 60 <1 949 1037 985 1239 3188	<1 0 63 <1 1043 1148 1142 1388 3975			
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc	ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010 1070 1150 1270	3 3 60 0 899 1033 1037 1156	0 12 60 <1 949 1037 985 1239	<1 0 63 <1 1043 1148 1142 1388			
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur	ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010 1070 1150 1270 2060	3 3 60 0 899 1033 1037 1156 3315	0 12 60 <1 949 1037 985 1239 3188	<1 0 63 <1 1043 1148 1142 1388 3975			
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN	ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 1010 1070 1150 1270 2060	3 3 60 0 899 1033 1037 1156 3315 current	0 12 60 <1 949 1037 985 1239 3188 history1	<1 0 63 <1 1043 1148 1142 1388 3975 history2			
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m method	0 0 60 1010 1070 1150 1270 2060 limit/base >25	3 3 60 0 899 1033 1037 1156 3315 current 2	0 12 60 <1 949 1037 985 1239 3188 history1 3	<1 0 63 <1 1043 1148 1142 1388 3975 history2 2			
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 1010 1070 1150 1270 2060 limit/base >25	3 3 60 0 899 1033 1037 1156 3315 current 2 0 2	0 12 60 <1 949 1037 985 1239 3188 history1 3 6	<1 0 63 <1 1043 1148 1142 1388 3975 history2 2 5			
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 limit/base >25	3 3 60 0 899 1033 1037 1156 3315 Current 2 0 2	0 12 60 <1 949 1037 985 1239 3188 history1 3 6 4	<1 0 63 <1 1043 1148 1142 1388 3975 history2 2 5 4			
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Silicon Sodium Potassium INFRA-RED Soot %	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 limit/base >25 >20	3 3 60 0 899 1033 1037 1156 3315 <u>current</u> 2 0 2 <u>current</u> 0 2	0 12 60 <1 949 1037 985 1239 3188 history1 3 6 4 history1 0.3	<1 0 63 <1 1043 1148 1142 1388 3975 history2 2 2 5 4 4 history2 0.2			
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Silicon Sodium Potassium INFRA-RED Soot % Nitration	ppm ppm ppm ppm ppm ppm ppm ppm ppm T S ppm ppm ppm	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 <i>limit/base</i> >25 >20 <i>limit/base</i> >3 >20	3 3 60 0 899 1033 1037 1156 3315 current 2 0 2 current 0.2 8.0	0 12 60 <1 949 1037 985 1239 3188 history1 3 6 4 history1 0.3 9.5	<1 0 63 <1 1043 1148 1142 1388 3975 history2 2 2 5 4 4 history2 0.2 8.1			
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Silicon Sodium Potassium INFRA-RED Soot %	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 limit/base >25 >20	3 3 60 0 899 1033 1037 1156 3315 <u>current</u> 2 0 2 <u>current</u> 0 2	0 12 60 <1 949 1037 985 1239 3188 history1 3 6 4 history1 0.3	<1 0 63 <1 1043 1148 1142 1388 3975 history2 2 2 5 4 4 history2 0.2			
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Silicon Sodium Potassium INFRA-RED Soot % Nitration	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 <i>limit/base</i> >25 >20 <i>limit/base</i> >3 >20	3 3 60 0 899 1033 1037 1156 3315 current 2 0 2 current 0.2 8.0	0 12 60 <1 949 1037 985 1239 3188 history1 3 6 4 history1 0.3 9.5	<1 0 63 <1 1043 1148 1142 1388 3975 history2 2 2 5 4 4 history2 0.2 8.1			
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 imit/base >25 imit/base >3 >20	3 3 60 0 899 1033 1037 1156 3315 <u>current</u> 2 0 2 <u>current</u> 0.2 8.0 18.9	0 12 60 <1 949 1037 985 1239 3188 history1 3 6 4 history1 0.3 9.5 20.6	<1 0 63 <1 1043 1148 1142 1388 3975 history2 2 5 4 4 history2 0.2 8.1 18.9			
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation	ppm ppm ppm ppm ppm ppm ppm ppm ppm TS ppm ppm ppm ppm	ASTM D5185m ASTM D7844 *ASTM D7624 *ASTM D7415	0 0 0 1010 1070 1150 1270 2060 2060 225 20 225 20 220 20 33 20 33 20 33 20	3 3 60 0 899 1033 1037 1156 3315 Current 2 0 2 Current 0.2 8.0 18.9 Current	0 12 60 <1 949 1037 985 1239 3188 history1 3 6 4 history1 0.3 9.5 20.6 history1	<1 0 63 <1 1043 1148 1142 1388 3975 history2 2 5 4 2 5 4 history2 0.2 8.1 18.9 history2			



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
Dec5/23	Feb15/24	Appearance	scalar	*Visual	NORML	NORML	NORML	NORML
ă	Fet	Odor	scalar	*Visual	NORML	NORML	NORML	NORML
		Emulsified Water	scalar	*Visual	>0.2	NEG	NEG	NEG
	1	Free Water	scalar	*Visual		NEG	NEG	NEG
		FLUID PROF	PERTIES	method	limit/base	current	history1	history2
		Visc @ 100°C	cSt	ASTM D445	15.4	14.3	14.1	14.2
		GRAPHS						
		Ferrous Alloys						
Dec5/23 -	20	30 - iron chromium						
Dec	E.A. 1 E. P	25 - nickel						
		_ 20						
		E 15						
		10						
		5			_			
		0						
				Dec5/23 -	5/24 -			
		Jun21/23 Aug21/23		Deci	Feb 15/24			
		Non-ferrous Me	tals					
		10 T 3						
		8 - copper						
		tin the second s						
		6- E						
		udd 4						
		2						
		0						
		Jun21/23 Aug21/23		Dec5/23	Feb15/24			
		, 4		De	Feb			
		Viscosity @ 100	°C		10.0	Base Number		
		18 - Abnormal			10.0	0		
		47			- 8.0			
		17-			B/H			and the second se
					HOY BE 6.0			
					0.0 KOH/g			
		Base 00015 73 14			6.0 - Buy Jaquin 4.0 -			
		2:16 Base 15- 3:14 13- Abnormal			• 0.9 per (mg	/		
		Base Base Base Base 15 14 13 Abnormal 12 11			0,HOX (J) Buy Base Number (J) HOX Base 2.0-			
		Base Base Base Base 15 14 13 Abnormal 12 11		e5/23	0,HOX (J) Buy Base Number (J) HOX Base 2.0-	21/23	21/23 	
		2:16 Base 15- 3:14 13- Abnormal		Dec5/23 +)(HO) B 6.0 - u) HO (M) HO (M	Jun21/23	Aug21/23	
4	Laboratory	Base Base Base Base 15 14 13 Abnormal 12 11	501 Madiso		-0.0 -0.0 -0.0 -0.0 -0.0 -0.0 -0.0 -0.0		vironmental - 91	
ANAB	Sample No.	Base (0-000) 15 14 12 11 E2012 Ump E2012 E007 E2012 E007 E2012 E007 E2012 E007 E2012 E007 E2012 E007	Recei	n Ave., Cary ved : 20	NC 27513 Feb 2024		vironmental - 91	8 - Hartland He Industrial Driv
	Sample No. Lab Number	: WearCheck USA - 5 : GFL0112980 : 06094016	Recei Teste	n Ave., Cary ved : 20 d : 21	NC 27513 Feb 2024 Feb 2024	GFL En	vironmental - 91	8 - Hartland H Industrial Driv Hartland, W
	Sample No. Lab Number Unique Number	: WearCheck USA - 5 : GFL0112980 : 06094016 : 10886869	Recei	n Ave., Cary ved : 20 d : 21	NC 27513 Feb 2024	GFL En	vironmental - 91 630 E	8 - Hartland H Industrial Driv Hartland, W US 5302
TETRE LEADONOV Certificate L2367 o discuss this	Sample No. Lab Number Unique Number Test Package	: WearCheck USA - 5 : GFL0112980 : 06094016 : 10886869	Recei Teste Diagn	n Ave., Cary ved : 20 d : 21 losed : 21	NC 27513 Feb 2024 Feb 2024 - We	GFL En	vironmental - 91 630 E Contac	8 - Hartland H Industrial Driv Hartland, W

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