

OIL ANALYSIS REPORT

Sample Rating Trend

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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.

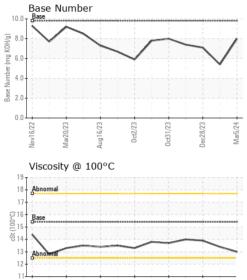
		Nov2022 N	-	Oct2023 Oct2023 Dec2023		
SAMPLE INFORI	MATION	method	limit/base	current	history1	history2
Sample Number		Client Info		GFL0099286	GFL0099278	GFL0105570
Sample Date		Client Info		05 Mar 2024	06 Feb 2024	28 Dec 2023
Machine Age	hrs	Client Info		0	0	0
Oil Age	hrs	Client Info		0	600	0
Oil Changed		Client Info		Not Changd	Changed	Not Changd
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
WEAR METAL	S	method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185m	>110	5	16	11
Chromium	ppm	ASTM D5185m	>4	0	1	<1
Nickel	ppm	ASTM D5185m	>2	0	<1	0
Titanium	ppm	ASTM D5185m		0	0	<1
Silver	ppm	ASTM D5185m	>2	0	0	0
Aluminum	ppm	ASTM D5185m	>25	0	4	2
Lead	ppm	ASTM D5185m	>45	0	5	_ <1
Copper	ppm		>85	0	<1	<1
Tin	ppm	ASTM D5185m	>4	0	<1	<1
Vanadium	ppm	ASTM D5185m		0	<1	0
Cadmium	ppm	ASTM D5185m		0	0	0
ouumum	ppin	ACTIVI DOTODITI		0	0	0
ADDITIVES	ppm	method	limit/base	current	history1	history2
			limit/base	current		
ADDITIVES	ppm	method ASTM D5185m			history1	history2
ADDITIVES Boron Barium	ppm ppm	method ASTM D5185m ASTM D5185m	0	current 6 0	history1 19 0	history2 30 0
ADDITIVES Boron Barium Molybdenum	ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60	current 6	history1 19	history2 30
ADDITIVES Boron Barium Molybdenum Manganese	ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m	0 0 60	current 6 0 55	history1 19 0 68	history2 30 0 68
ADDITIVES Boron Barium Molybdenum	ppm ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010	current 6 0 55 0	history1 19 0 68 <1	history2 30 0 68 <1
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium	ppm ppm ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0	current 6 0 555 0 879	history1 19 0 68 <1 431	history2 30 0 68 <1 351
ADDITIVES Boron Barium Molybdenum Manganese Magnesium	ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010 1070	Current 6 0 55 0 879 1276	history1 19 0 68 <1 431 2117 1126	history2 30 0 68 <1 351 1696
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus	ppm ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010 1070 1150	Current 6 0 55 0 879 1276 1033	history1 19 0 68 <1 431 2117	history2 30 0 68 <1 351 1696 997
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc	ppm ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185m	0 0 60 0 1010 1070 1150 1270	current 6 0 55 0 879 1276 1033 1209	history1 19 0 68 <1 431 2117 1126 1507	history2 30 0 68 <1 351 1696 997 1219
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur	ppm ppm ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 1010 1070 1150 1270 2060	Current 6 0 555 0 879 1276 1033 1209 3691	history1 19 0 68 <1 431 2117 1126 1507 3730	history2 30 0 68 <1 351 1696 997 1219 3420
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN	ppm ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185m	0 0 60 1010 1070 1150 1270 2060	current 6 0 555 0 879 1276 1033 1209 3691 current	history1 19 0 68 <1 431 2117 1126 1507 3730 history1	history2 30 0 68 <1 351 1696 997 1219 3420 history2
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185m	0 0 60 1010 1070 1150 1270 2060 Limit/base >30	current 6 0 555 0 879 1276 1033 1209 3691 current 2	history1 19 0 68 <1 431 2117 1126 1507 3730 history1 5	history2 30 0 68 <1 351 1696 997 1219 3420 history2 5
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185m	0 0 60 0 1010 1070 1150 1270 2060 Limit/base >30	current 6 0 555 0 879 1276 1033 1209 3691 current 2 1 0	history1 19 0 68 <1 431 2117 1126 1507 3730 history1 5 5	history2 30 0 68 <1 351 1696 997 1219 3420 history2 5 0
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185m	0 0 60 0 1010 1070 1150 1270 2060 limit/base >30	current 6 0 555 0 879 1276 1033 1209 3691 current 2 1 0	history1 19 0 68 <1 431 2117 1507 3730 history1 5 5 2	history2 30 0 68 <1 351 1696 997 1219 3420 history2 5 0 3
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	method ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 Imit/base >30 >20 Imit/base	current 6 0 555 0 879 1276 1033 1209 3691 current 2 1 0 current 0.2	history1 19 0 68 <1 431 2117 1126 1507 3730 history1 5 5 2 history1	history2 30 0 68 <1 351 1696 997 1219 3420 history2 5 0 3 history2
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot %	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 Imit/base >30 >20 Imit/base	current 6 0 55 0 879 1276 1033 1209 3691 current 2 1 0 current	history1 19 0 68 <1 431 2117 1126 1507 3730 history1 5 5 2 history1 0.5	history2 30 0 68 <1 351 1696 997 1219 3420 history2 5 0 3 history2 0 3 0.3
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % Nitration	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 imit/base >30 220 imit/base >3 >20	current 6 0 555 0 879 1276 1033 1209 3691 current 2 1 0 current 0 current 0.2 6.1	history1 19 0 68 <1 431 2117 1126 1507 3730 history1 5 2 history1 0.5 11.2	history2 30 0 68 <1 351 1696 997 1219 3420 history2 5 0 3 history2 0 3 0.3 9.9
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation FLUID DEGRAM	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185m ASTM D7185M *ASTM D7624 *ASTM D7624 *ASTM D7415	0 0 0 1010 1070 1150 1270 2060 2060 2060 2060 200 200 200 200 20	current 6 0 555 0 879 1276 1033 1209 3691 current 2 1 0 current 0.2 6.1 17.8 current	history1 19 0 68 <1 431 2117 1507 3730 history1 5 5 2 history1 0.5 11.2 23.5 history1	Aistory2 30 0 68 <1 351 1696 997 1219 3420 history2 5 0 33 history2 0.3 9.9 20.6
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	method ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 2060 2060 2060 200 200 200 200 20	current 6 0 55 0 879 1276 1033 1209 3691 current 2 1 0 current 0.2 6.1 17.8	history1 19 0 68 <1 431 2117 1126 1507 3730 history1 5 5 2 history1 0.5 11.2 23.5	history2 30 0 68 <1 351 1696 997 1219 3420 history2 5 0 3 history2 0.3 9.9 20.6



Nov16/22

Mar20/23

OIL ANALYSIS REPORT



Aug16/23

			-	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		
0ct2/23	0ct31/23 -	Dec28/23	Mar5/24 -	Appearance	scalar	*Visual	NORML	NORML	NORML	NORML
09	0ct3	Dec2	Mai	Odor	scalar	*Visual	NORML	NORML	NORML	NORML
				Emulsified Water	scalar	*Visual	>0.2	NEG	NEG	NEG
				Free Water	scalar	*Visual		NEG	NEG	NEG
		1		FLUID PROPE	RTIES	method	limit/base	current	history1	history2
				Visc @ 100°C	cSt	ASTM D445		13.0	13.4	13.9
				GRAPHS						
~	1			Ferrous Alloys						
				⁷⁰ L						
/23	/23	/23	V C	60 - iron chromium						
0ct2/23	0ct31/23	Dec28/23	MC	50 - nickel						
		_								
				₽ 30						
				20			1			
				10-	L	~				
					C7					
				Nov16/22 Mar20/23 Aug16/23	0ct2/23	0ct31/23 Dec28/23	Mar5/24			
						Dec 0c	Z			
				Non-ferrous Metal	S					
				12 copper	4					
				10 - management lead	Λ					
				8-	11					
				E	/ \					
				dd 6	1					
				4		/				
				2		1	1			
				1	-4		1			
				23 23	123	123	124			
				Nov16/22 Mar20/23 Aug16/23	0ct2/23	0ct31/23 Dec28/23	Mar5/24			
				≥ ≥ ⊲ Viscositv @ 100°C		0				
				¹⁹ T			10.0	Base Number		
				18 - Abnormal			10.			
				17						
				C16			(b)HOX (b) Base Number (mg KOH(d)		\searrow	
				G016 Base 15 53 14			B_ 6.0	0	\sim	V
				š14			aq 4.0	0		
				13	\sim		A ase			
				12 Abnormal			⁶⁶ 2.0	D -		
				11						
				5/22	2/23 -	1/23	5/24	6/22	5/23 -	3/23 -
				Nov16/22 Mar20/23 Aug16/23	0ct2/23	0ct31/23 Dec28/23	Mar5/24	Nov16/22 Mar20/23	Aug16/23 0ct2/23	Dec28/23
				4						_
								CEL Env	vironmontal 016	Marifiald Hard
d		Labora	tory	: WearCheck USA - 50	1 Madiso	n Ave., Cary	, NC 27513	GFL EIN	rironmental - 846 -	mayneid Haul
	R	Sample	e No.	: GFL0099286	Recei	ived : 19	Mar 2024			State Route
	B	Sample Lab Nu	e No. Imber	: GFL0099286 : 06122036	Recei Teste	ived :19 ed :19	Mar 2024 Mar 2024			State Route Mayfield, I
	B E D RY	Sample Lab Nu Unique N	e No. Imber Number	: GFL0099286 : <mark>06122036</mark> : 10936187	Recei	ived :19 ed :19	Mar 2024		3426	State Route Mayfield, I US 420
CREDIT CR	B R 367	Sample Lab Nu Unique N Test Pa	e No. Imber Number Ickage	: GFL0099286 : 06122036	Recei Teste Diagn	ived : 19 ed : 19 nosed : 19	Mar 2024 Mar 2024 Mar 2024 - W		3426 Contac	State Route Mayfield, I

VISUAL method limit/base current historv1 historv2

Submitted By: Jack Lindsey