

OIL ANALYSIS REPORT

Sample Rating Trend



Machine Id 10979

Component Diesel Engine

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

DIAGNOSIS

Recommendation

Resample at the next service interval to monitor. NOTE: Please provide information regarding reservoir capacity, filter type and micron rating with next sample.

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.

	GAL)									
Sample Date Client Info 13 Feb 2023 24 Oct 2022 31 Mar 2022 Machine Age hrs Client Info 16889 1606 14801 Dil Age hrs Client Info 16889 1606 14801 Dil Changed Client Info Changed NorRMAL NorRMAL NorRMAL CONTAMINATION method limit/base current history1 history1 Vater WC Method >5 <1.0 <1.0 <1.0 Silvol WC Method >0.2 NEG NEG NEG Velar METALS method limit/base current history1 history2 tron ppm ASTM 05185m >20 <1 <1 <1 <1 transit ppm ASTM 05185m >20 <1 <1 0 <1 0 <1 0 <1 0 <1 0 <1 0 <1 0 <1 0 <1 0 <1 0	SAMPLE INFOR	MATION	method	limit/base	current	history1	history2			
Machine Age hrs Client Info 16889 1606 14801 Di Aga hrs Client Info 16889 1606 14801 Di Aga Krs Client Info 16889 1606 14801 Di Changed Client Info NORMAL NORMAL NORMAL NORMAL CONTAMINATION method 5.5 <1.0	Sample Number		Client Info		GFL0071371	GFL0063084	GFL0049260			
Dil Age hrs Client Info 16889 1806 14801 Dil Changed Client Info Changed NorRMAL NorRMAL NorRMAL CONTAMINATION method Imitibase current history1 history1 Fuel WC Method >5.2 <1.0	Sample Date		Client Info		13 Feb 2023	24 Oct 2022	31 Mar 2022			
Dil Changed Client Info Changed NorRMAL NorRMAL NorRMAL GONTAMINATION method limit/base current history1 Mistory2 Guel WC Method >5.5 <1.0	Achine Age	hrs	Client Info		16889	1606	14801			
Sample Status NORMAL NORMAL NORMAL NORMAL NORMAL CONTAMINATION method imit/base current history1 history1 history2 Fuel WC Method >5 <1.0	Dil Age	hrs	Client Info		16889	1606	14801			
CONTAMINATION method imit/base current history1 history2 Fuel WC Method >5 <1.0	Dil Changed		Client Info		Changed	Changed	Not Changd			
Fuel WC Method >5 <1.0 <1.0 <1.0 Nater WC Method >0.2 NEG NEG NEG Slycol WC Method NEG NEG NEG NEG WEAR METALS method iimit/base current history1 history2 ron ppm ASTM D5185m >100 9 16 8 Dromium ppm ASTM D5185m >20 <1	Sample Status				NORMAL	NORMAL	NORMAL			
Water WC Method >0.2 NEG NEG NEG NEG Slycol WC Method Imit/base current history1 history2 ron ppm ASTM D5185m >100 9 16 8 Chromium ppm ASTM D5185m >4 0 0 <1 1 Vickel ppm ASTM D5185m >4 0 0 <1 0 Silver ppm ASTM D5185m >3 0 0 <1 0 Silver ppm ASTM D5185m >30 0 <1 2 6 Silver ppm ASTM D5185m >40 <1 0 <1 2 6 6 1 1 A1	CONTAMINAT	ION	method	limit/base	current	history1	history2			
Bilycol WC Method NEG NEG NEG WEAR METALS method limit/base current history1 history2 ron ppm ASTM D5185m >20 <1	Fuel		WC Method	>5	<1.0	<1.0	<1.0			
WEAR METALS method limit/base current history1 history2 pron ppm ASTM D5185m >100 9 16 8 Dromium ppm ASTM D5185m >20 <1	Vater		WC Method	>0.2	NEG	NEG	NEG			
ron ppm ASTM D5185m >100 9 16 8 Chromium ppm ASTM D5185m >20 <1	Glycol		WC Method		NEG	NEG	NEG			
Dromium ppm ASTM D5185m >20 <1 <1 <1 Nickel ppm ASTM D5185m >4 0 0 <1	WEAR METAL	.S	method	limit/base	current	history1	history2			
Nickel ppm ASTM D5185m >4 0 0 <1 Titanium ppm ASTM D5185m >3 0 0 <1	ron	ppm	ASTM D5185m	>100	9	16	8			
Fitanium ppm ASTM D5185m 0 <1 0 Silver ppm ASTM D5185m >3 0 0 <1		ppm	ASTM D5185m	>20	<1	<1				
Bilver ppm ASTM D5185m >3 0 0 <1 Numinum ppm ASTM D5185m >20 2 4 2 Lead ppm ASTM D5185m >330 <1	lickel	ppm		>4	0	0				
Numinum ppm ASTM D5185m >20 2 4 2 eead ppm ASTM D5185m >40 <1	ītanium	ppm	ASTM D5185m		0	<1	0			
Lead ppm ASTM D5185m >40 <1 0 <1 Copper ppm ASTM D5185m >330 <1	Silver	ppm	ASTM D5185m	>3	0	0				
Dept ASTM D5185m >330 <1 2 6 Tin ppm ASTM D5185m >15 <1	Aluminum	ppm	ASTM D5185m	>20	2	4	2			
Tin ppm ASTM D5185m >15 <1 <1 <1 Antimony ppm ASTM D5185m 0 Anadium ppm ASTM D5185m 0 0 0 0 Cadmium ppm ASTM D5185m 0 6 16 11 Cadmium ppm ASTM D5185m 0 6 16 11 Soron ppm ASTM D5185m 0 61 60 58 Adaganese ppm ASTM D5185m 0 61 60 58 Adaganese ppm ASTM D5185m 0 <1		ppm	ASTM D5185m	>40	<1	0	<1			
Initimony ppm ASTM D5185m Vanadium ppm ASTM D5185m 0 <1	Copper	ppm	ASTM D5185m	>330	<1	2	6			
Yanadium ppm ASTM D5185m 0 <1 0 Cadmium ppm ASTM D5185m 0 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 6 16 11 Barium ppm ASTM D5185m 0 0 0 0 0 Aonybeenum ppm ASTM D5185m 0 6 16 11 Magnesium ppm ASTM D5185m 0 <1 <1 <1 <1 Aggnesium ppm ASTM D5185m 1010 880 818 960 Calcium ppm ASTM D5185m 1070 1060 1194 1178 Phosphorus ppm ASTM D5185m 1270 1164 1256 1228 Sulfur ppm ASTM D5185m 2060 3441 3267 2870 CONTAMINANTS method limit/base <td>īn</td> <td>ppm</td> <td>ASTM D5185m</td> <td>>15</td> <th><1</th> <td><1</td> <td><1</td>	īn	ppm	ASTM D5185m	>15	<1	<1	<1			
December ppm ASTM D5185m 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 6 16 11 Barium ppm ASTM D5185m 0 0 0 0 0 0 Adoptednum ppm ASTM D5185m 0 61 60 58 Manganese ppm ASTM D5185m 0 <1 <1 <1 Aggnesium ppm ASTM D5185m 1010 880 818 960 Calcium ppm ASTM D5185m 1070 1060 1194 1178 Phosphorus ppm ASTM D5185m 1270 1164 1256 1228 Sulfur ppm ASTM D5185m 2060 3441 3267 2870 CONTAMINANTS method limit/base current history1 history2 Solicon ppm ASTM D5185m <td>Antimony</td> <td>ppm</td> <td>ASTM D5185m</td> <td></td> <th></th> <td></td> <td></td>	Antimony	ppm	ASTM D5185m							
ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 6 16 11 Barium ppm ASTM D5185m 0 0 0 0 Adolybdenum ppm ASTM D5185m 60 61 60 58 Manganese ppm ASTM D5185m 0 <1	/anadium	ppm	ASTM D5185m		0	<1	0			
Boron ppm ASTM D5185m 0 6 16 11 Barium ppm ASTM D5185m 0 0 0 0 0 Molybdenum ppm ASTM D5185m 60 61 60 58 Manganese ppm ASTM D5185m 0 <1	Cadmium	ppm	ASTM D5185m		0	0	0			
Barium ppm ASTM D5185m 0 0 0 0 Molybdenum ppm ASTM D5185m 60 61 60 58 Manganese ppm ASTM D5185m 0 <1	ADDITIVES		method	limit/base	current	history1	history2			
Aolybdenum ppm ASTM D5185m 60 61 60 58 Manganese ppm ASTM D5185m 0 <1	Boron	ppm	ASTM D5185m	0	6	16	11			
Anganese ppm ASTM D5185m 0 <1 <1 <1 Magnesium ppm ASTM D5185m 1010 880 818 960 Calcium ppm ASTM D5185m 1010 880 818 960 Calcium ppm ASTM D5185m 1070 1060 1194 1178 Phosphorus ppm ASTM D5185m 1070 1060 1194 1178 Phosphorus ppm ASTM D5185m 1150 932 939 1108 Zinc ppm ASTM D5185m 1270 1164 1256 1228 Sulfur ppm ASTM D5185m 2060 3441 3267 2870 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >20 <1	Barium	ppm	ASTM D5185m	0	0	0	0			
Asymptotic Asymptotic Asymptotic Base of the symptotic Base of the symptotic	/lolybdenum	ppm	ASTM D5185m	60	61	60	58			
Color pp ASTM D5185m 1070 1060 1194 1178 Calcium ppm ASTM D5185m 1070 1060 1194 1178 Phosphorus ppm ASTM D5185m 1150 932 939 1108 Zinc ppm ASTM D5185m 1270 1164 1256 1228 Sulfur ppm ASTM D5185m 2060 3441 3267 2870 CONTAMINANTS method limit/base current history1 history2 Solicon ppm ASTM D5185m >25 3 5 3 Sodium ppm ASTM D5185m >20 <1	<i>l</i> anganese	ppm	ASTM D5185m	0	<1	<1	<1			
Phosphorus ppm ASTM D5185m 1150 932 939 1108 Zinc ppm ASTM D5185m 1270 1164 1256 1228 Sulfur ppm ASTM D5185m 2060 3441 3267 2870 CONTAMINANTS method limit/base current history1 history2 Solicon ppm ASTM D5185m >25 3 5 3 Solicon ppm ASTM D5185m >25 3 5 3 Solicon ppm ASTM D5185m >20 <1 1 8 Potassium ppm ASTM D5185m >20 <1 1 31 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.3 0.5 0.3 Jitration Abs/cm *ASTM D7624 >20 6.5 8.9 7.6 Sulfation Abs/.1mm *ASTM D7415	/lagnesium	ppm	ASTM D5185m	1010	880	818	960			
Ppm ASTM D5185m 1270 1164 1256 1228 Sulfur ppm ASTM D5185m 2060 3441 3267 2870 CONTAMINANTS method limit/base current history1 history2 Solicon ppm ASTM D5185m >25 3 5 3 Solicon ppm ASTM D5185m >25 3 5 3 Solicon ppm ASTM D5185m >20 <1	Calcium	ppm	ASTM D5185m	1070	1060	1194	1178			
SulfurppmASTM D5185m2060344132672870CONTAMINANTSmethodlimit/basecurrenthistory1history2SiliconppmASTM D5185m>25353SodiumppmASTM D5185m>204418PotassiumppmASTM D5185m>20<1	hosphorus	ppm	ASTM D5185m	1150	932	939	1108			
CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 3 5 3 Sodium ppm ASTM D5185m >25 3 5 3 Sodium ppm ASTM D5185m >20 <1	linc	ppm	ASTM D5185m	1270	1164	1256	1228			
Silicon ppm ASTM D5185m >25 3 5 3 Sodium ppm ASTM D5185m >20 4 4 18 Potassium ppm ASTM D5185m >20 <1 1 31 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.3 0.5 0.3 Nitration Abs/cm *ASTM D7624 >20 6.5 8.9 7.6 Sulfation Abs/.1mm *ASTM D7415 >30 18.1 21.6 19.9 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 13.4 16.4 15.4	Sulfur	ppm	ASTM D5185m	2060	3441	3267	2870			
Sodium ppm ASTM D5185m 4 4 18 Potassium ppm ASTM D5185m<>20 <1	CONTAMINAN	ITS	method	limit/base	current	history1	history2			
Potassium ppm ASTM D5185m >20 <1 1 31 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.3 0.5 0.3 Mitration Abs/cm *ASTM D7624 >20 6.5 8.9 7.6 Sulfation Abs/.1mm *ASTM D7415 >30 18.1 21.6 19.9 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 13.4 16.4 15.4	Silicon	ppm	ASTM D5185m	>25	3	5	3			
INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.3 0.5 0.3 Nitration Abs/cm *ASTM D7624 >20 6.5 8.9 7.6 Sulfation Abs/.1mm *ASTM D7415 >30 18.1 21.6 19.9 FLUID DEGRADATION method limit/base current history1 history2 Dxidation Abs/.1mm *ASTM D7414 >25 13.4 16.4 15.4	Sodium	ppm	ASTM D5185m		4	4	18			
Soot % % *ASTM D7844 >3 0.3 0.5 0.3 Nitration Abs/cm *ASTM D7624 >20 6.5 8.9 7.6 Sulfation Abs/.1mm *ASTM D7415 >30 18.1 21.6 19.9 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 13.4 16.4 15.4	Potassium		ASTM D5185m	>20	<1	1	31			
Nitration Abs/cm *ASTM D7624 >20 6.5 8.9 7.6 Sulfation Abs/.1mm *ASTM D7615 >30 18.1 21.6 19.9 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 13.4 16.4 15.4	INFRA-RED		method	limit/base	current	history1	history2			
Abs/cm *ASTM D7624 >20 6.5 8.9 7.6 Sulfation Abs/.1mm *ASTM D7415 >30 18.1 21.6 19.9 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 13.4 16.4 15.4	Soot %	%	*ASTM D7844	>3	0.3	0.5	0.3			
Sulfation Abs/.1mm *ASTM D7415 >30 18.1 21.6 19.9 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 13.4 16.4 15.4										
Dxidation Abs/.1mm *ASTM D7414 >25 13.4 16.4 15.4										
-	FLUID DEGRAI	DATION	method	limit/base	current	history1	history2			
Base Number (BN) mg KOH/g ASTM D2896 9.8 8.3 9.5 9.3	Dxidation	Abs/.1mm	*ASTM D7414	>25	13.4	16.4	15.4			
	Base Number (BN)	mg KOH/g	ASTM D2896	9.8	8.3	9.5	9.3			

Submitted By: NOEL MATTHEWS



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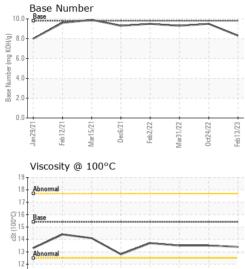
Jan 29/21

Feb12/21

Mar15/21

OIL ANALYSIS REPORT

VISUAL



		VISUAL						
		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
22	22 -	Appearance	scalar	*Visual	NORML	NORML	NORML	NORML
Feb2/22	Mars 1/22 Oct24/22 Feb 13/23	Odor		*Visual	NORML	NORML	NORML	NORML
-			scalar					
		Emulsified Water	scalar	*Visual	>0.2	NEG	NEG	NEG
		Free Water	scalar	*Visual		NEG	NEG	NEG
		FLUID PROPE		method	limit/base	current	history1	history2
		Visc @ 100°C	cSt	ASTM D445	15.4	13.4	13.5	13.5
/		GRAPHS						
		Ferrous Alloys						
22	22	iron	Λ					
Feb2/22	0ct24/22 0ct24/22	50 - nickel	()					
4	2 0 1							
		E 40						
		30						
		20	1					
		10		\sim				
			5 51	2 2	22			
		Jan 29/21 Feb 1 2/21 Marl 5/21	Dec6/21 Feb2/22	Mar31/22 0ct24/22	Feb 13/23			
				N O	a .			
		Non-ferrous Meta	ls					
		copper	٨					
		sessesses tin						
		25 -	/ /					
		E 20-						
		1 5	/	1				
		10	1					
		5	1	5				
		0						
		Jan 29/21 Feb 1 2/21 Mar 1 5/21	Dec6/21 Feb2/22	Mar31/22 0ct24/22	Feb 13/23			
		Jan, Feb	Tet De	Marí	Feb			
		Viscosity @ 100°C	2			Base Number		
		19 T			10.			
		18 - Abnormal	1					
		17-			(B/H)	.0		
		D ¹⁶ Base			Base Number (mg KOH(g)	.0		
		G16 Base 15 53 14			per (n			
		³ 14	~		4.	.0		
		13 Abnormal			888 2.	0		
		12 -						
			2	2			2	2
		Jan 29/21 Feb 1 2/21 Marl 5/21	Dec6/21 Feb2/22	Mar31/22 0ct24/22	Feb 13/23	Jan 29/21 Feb 1 2/21 Mar1 5/21	Dec6/21 Feb2/22	Mar31/22 0ct24/22
		Jai Fel	σű	Ma 0 0	Fet	Ja Fel		Ma
	l obereterri	· MoorChask UCA 50	1 Madi-				vironmental	015 Oalumet
	Laboratory	: WearCheck USA - 50 : GFL0071371	1 Madisol Recei		, NC 27513 7 Feb 2023	GFL EN	vironmental - (0 15 - Columb 00 Farrow Roa
4			necel				780	IU FAITOW ROA
	Sample No.		Teste	d · 20	Feb 2023			Columbia S
	Sample No. Lab Number	: 05770626	Teste Diagn) Feb 2023 Feb 2023 - V	Ves Davis	L	Columbia, S JS 29203-32
	Sample No.	: <mark>05770626</mark> : 10345243	Teste Diagn			Ves Davis	L Contact: NOE	JS 29203-32

Submitted By: NOEL MATTHEWS