

OIL ANALYSIS REPORT

Sample Rating Trend



Machine Id 638644 Component

Diesel Engine Fluid PETRO CANADA DURON SHP 10W30 (--- GAL)

DIAGNOSIS

Recommendation

Resample at the next service interval to monitor. Please specify the component make and model with your next sample.

Wear

All component wear rates are normal.

Contamination

Elevated aluminum (AI) and/or lead (Pb) and potassium (K) levels in your metals analysis are likely a result of solder flux release into the lubricant and is common on new equipment/components. There is no indication of any contamination in the oil.

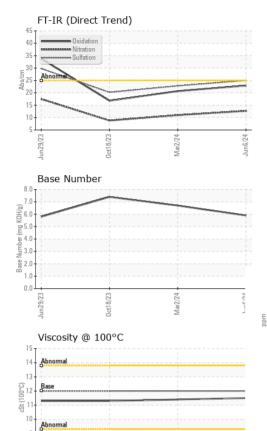
Fluid Condition

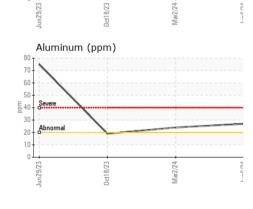
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

Sample Number Client Info PCA0125189 PCA0119016 PCA010 Sample Date Client Info 06 Jun 2024 02 Mar 2024 18 Oct 2 Machine Age mls Client Info 104975 90094 0 Oil Age mls Client Info 104975 90094 0 Oil Age mls Client Info Changed Not Changed Not Changed Sample Status CONTAMINATION method Immi/base current history1 hist Fuel WC Method >5 <1.0 <1.0 <1.0 Water WC Method >0.2 NEG NEG NEG Veater WC Method >0.2 NEG NEG NEG Iron ppm ASTM D5185m >100 76 60 32 Chromium ppm ASTM D5185m >20 27 24 19 Lead ppm ASTM D5185m >330 81 83 199			2024	Mar2024 Ju	3 Oct2023	Jun202		GAL)
Sample Date Client Info 06 Jun 2024 02 Mar 2024 18 Oct 2 Machine Age mls Client Info 104975 90094 0 Oil Age mls Client Info 104975 90094 0 Oil Changed Client Info 104975 90094 0 Oil Changed Client Info Changed Not Chang Not Changed Sample Status Imit/base current history1 hist Fuel WC Method >5 <1.0 <1.0 <1.0 Water WC Method NEG NEG NEG NEG Machine ppm ASTM D5185m >100 76 60 32 Chromium ppm ASTM D5185m >20 3 2 2 Nickel ppm ASTM D5185m >3 0 0 0 Aluminum ppm ASTM D5185m >3 0 0 1 Copper ppm ASTM D5185m >30	ory2	history	history1	current	limit/base	method	MATION	SAMPLE INFORM
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Oil Changed Citent Info Changed Not Changd Not Chan		70149	90094	104975		Client Info	mls	Machine Age
Sample Status NORMAL Normator Normator <td></td> <td>0</td> <td>90094</td> <th>104975</th> <td></td> <td>Client Info</td> <td>mls</td> <td>Oil Age</td>		0	90094	104975		Client Info	mls	Oil Age
CONTAMINATION method limit/base current history1 hist Fuel WC Method >5 <1.0	ngd	Not Chang	Not Changd	Changed		Client Info		Oil Changed
Fuel WC Method >5 <1.0 <1.0 <1.0 Water WC Method >0.2 NEG NEG NEG NEG Glycol WC Method NEG NEG NEG NEG NEG WEAR METALS method limit/base current history1 history1 Iron ppm ASTM D5185m >100 76 60 32 Othornium ppm ASTM D5185m >20 3 2 2 Nickel ppm ASTM D5185m >20 3 0 0 0 AItminum ppm ASTM D5185m >3 0 0 0 0 Auminum ppm ASTM D5185m >20 27 24 19 Lead ppm ASTM D5185m >20 27 24 19 Lead ppm ASTM D5185m >330 81 833 199 Tin ppm ASTM D5185m 0 0<	L	NORMAL	NORMAL	-				-
Water WC Method >0.2 NEG NEG NEG NEG Glycol WC Method Imit/base current history1 hist Iron ppm ASTM D5185m >100 76 60 32 Chromium ppm ASTM D5185m >20 3 2 2 Nickel ppm ASTM D5185m >4 1 0 0 Aluminum ppm ASTM D5185m >3 0 0 0 Aluminum ppm ASTM D5185m >3 0 0 0 Lead ppm ASTM D5185m >20 27 24 19 Lead ppm ASTM D5185m >30 81 83 199 Tin ppm ASTM D5185m >40 0 0 0 Cadmium ppm ASTM D5185m 0 0 0 0 ADDITIVES method limit/base current history1 histo	ory2	history	history1	current	limit/base	method	ON	CONTAMINATI
Glycol WC Method NEG NEG NEG NEG WEAR METALS method limit/base current history1 history1 Iron ppm ASTM D5185m >100 76 60 32 Chromium ppm ASTM D5185m >20 3 2 2 Nickel ppm ASTM D5185m >4 1 0 0 Titanium ppm ASTM D5185m >3 0 0 0 Silver ppm ASTM D5185m >3 0 0 1 Copper ppm ASTM D5185m >30 0 0 1 Copper ppm ASTM D5185m >40 0 0 1 Copper ppm ASTM D5185m >15 2 <1		<1.0	<1.0	<1.0	>5	WC Method		Fuel
WEAR METALS method limit/base current history1 history1 Iron ppm ASTM D5185m >100 76 60 32 Chromium ppm ASTM D5185m >20 3 2 2 Nickel ppm ASTM D5185m >4 1 0 0 Titanium ppm ASTM D5185m >4 1 0 0 Silver ppm ASTM D5185m >3 0 0 0 Auminum ppm ASTM D5185m >20 27 24 19 Lead ppm ASTM D5185m >20 27 24 19 Lead ppm ASTM D5185m >30 81 83 199 Tin ppm ASTM D5185m >15 2 <1		NEG	NEG	NEG	>0.2	WC Method		Water
Iron ppm ASTM D5185m >100 76 60 32 Chromium ppm ASTM D5185m >20 3 2 2 Nickel ppm ASTM D5185m >4 1 0 0 Titanium ppm ASTM D5185m >3 0 0 0 Aluminum ppm ASTM D5185m >3 0 0 0 Aluminum ppm ASTM D5185m >20 27 24 19 Lead ppm ASTM D5185m >40 0 0 1 Copper ppm ASTM D5185m >330 81 83 199 Tin ppm ASTM D5185m >15 2 <1		NEG	NEG	NEG		WC Method		Glycol
Chromium ppm ASTM D5185m >20 3 2 2 Nickel ppm ASTM D5185m >4 1 0 0 Titanium ppm ASTM D5185m >3 0 0 0 Silver ppm ASTM D5185m >3 0 0 0 Aluminum ppm ASTM D5185m >20 27 24 19 Lead ppm ASTM D5185m >20 27 24 19 Lead ppm ASTM D5185m >20 27 24 19 Lead ppm ASTM D5185m >40 0 0 1 <10	ory2	history	history1	current	limit/base	method	S	WEAR METALS
Nickel ppm ASTM D5185m >4 1 0 0 Titanium ppm ASTM D5185m 1 <1		32	60	76	>100	ASTM D5185m	ppm	Iron
Initanium ppm ASTM D5185m 1 <1 <1 <1 Silver ppm ASTM D5185m >3 0 0 0 Aluminum ppm ASTM D5185m >20 27 24 19 Lead ppm ASTM D5185m >20 27 24 19 Lead ppm ASTM D5185m >40 0 0 1 7 Copper ppm ASTM D5185m >330 81 83 199 Tin ppm ASTM D5185m >15 2 <1		2	2	3	>20	ASTM D5185m	ppm	Chromium
Silver ppm ASTM D5185m >3 0 0 0 Aluminum ppm ASTM D5185m >20 27 24 19 Lead ppm ASTM D5185m >40 0 0 1 Copper ppm ASTM D5185m >330 81 83 199 Tin ppm ASTM D5185m >15 2 <1		0	0	1	>4	ASTM D5185m	ppm	Nickel
Aluminum ppm ASTM D5185m >20 27 24 19 Lead ppm ASTM D5185m >40 0 0 1 Copper ppm ASTM D5185m >330 81 83 199 Tin ppm ASTM D5185m >15 2 <1		<1	<1	1		ASTM D5185m	ppm	Titanium
Lead ppm ASTM D5185m >40 0 0 1 Copper ppm ASTM D5185m >330 81 83 199 Tin ppm ASTM D5185m >15 2 <1		0	0	0	>3	ASTM D5185m	ppm	Silver
Copper ppm ASTM D5185m >330 81 83 199 Tin ppm ASTM D5185m >15 2 <1		19	24	27	>20	ASTM D5185m	ppm	Aluminum
Tin ppm ASTM D5185m >15 2 <1 <1 Vanadium ppm ASTM D5185m <1		1	0	0	>40	ASTM D5185m	ppm	Lead
Vanadium ppm ASTM D5185m <1 0 0 Cadmium ppm ASTM D5185m 0 0 0 0 ADDITIVES method limit/base current history1 history1 Boron ppm ASTM D5185m 2 6 7 7 Barium ppm ASTM D5185m 2 6 7 7 Barium ppm ASTM D5185m 0 0 <1		199	83	81	>330	ASTM D5185m	ppm	Copper
Cadmium ppm ASTM D5185m 0 0 0 0 ADDITIVES method limit/base current history1 history1 history1 Boron ppm ASTM D5185m 2 6 7 7 Barium ppm ASTM D5185m 0 0 1 0 Molybdenum ppm ASTM D5185m 0 0 2 <1 0 Magnesium ppm ASTM D5185m 0 2 <1 1 Magnesium ppm ASTM D5185m 950 977 898 843 Calcium ppm ASTM D5185m 1050 1388 1322 1172 Phosphorus ppm ASTM D5185m 995 1081 1050 887 Zinc ppm ASTM D5185m 2600 2651 2523 2355 CONTAMINANTS method limit/base current history1 history1 Silicon <td></td> <td><1</td> <td><1</td> <th>2</th> <td>>15</td> <td>ASTM D5185m</td> <td>ppm</td> <td>Tin</td>		<1	<1	2	>15	ASTM D5185m	ppm	Tin
ADDITIVES method limit/base current history1 histor Boron ppm ASTM D5185m 2 6 7 7 Barium ppm ASTM D5185m 0 0 <1		0	0	<1		ASTM D5185m	ppm	Vanadium
Boron ppm ASTM D5185m 2 6 7 7 Barium ppm ASTM D5185m 0 0 <1		0	0	0		ASTM D5185m	ppm	Cadmium
Barium ppm ASTM D5185m 0 0 <1 0 Molybdenum ppm ASTM D5185m 50 63 61 57 Manganese ppm ASTM D5185m 0 2 <1	ory2	history	history1	current	limit/base	method		ADDITIVES
Molybdenum ppm ASTM D5185m 50 63 61 57 Manganese ppm ASTM D5185m 0 2 <1		7	7	6	2	ASTM D5185m	ppm	Boron
Manganese ppm ASTM D5185m 0 2 <1 1 Magnesium ppm ASTM D5185m 950 977 898 843 Calcium ppm ASTM D5185m 1050 1388 1322 1172 Phosphorus ppm ASTM D5185m 995 1081 1050 887 Zinc ppm ASTM D5185m 1180 1376 1240 1198 Sulfur ppm ASTM D5185m 2600 2651 2523 2355 CONTAMINANTS method limit/base current history1 histor Silicon ppm ASTM D5185m >25 7 7 4 Sodium ppm ASTM D5185m 260 2 3		0	<1	0	0	ASTM D5185m	ppm	Barium
Magnesium ppm ASTM D5185m 950 977 898 843 Calcium ppm ASTM D5185m 1050 1388 1322 1172 Phosphorus ppm ASTM D5185m 995 1081 1050 887 Zinc ppm ASTM D5185m 1180 1376 1240 1198 Sulfur ppm ASTM D5185m 2600 2651 2523 2355 CONTAMINANTS method limit/base current history1 histor Silicon ppm ASTM D5185m >25 7 7 4 Sodium ppm ASTM D5185m 7 2 3		57	61	63	50	ASTM D5185m	ppm	Molybdenum
Calcium ppm ASTM D5185m 1050 1388 1322 1172 Phosphorus ppm ASTM D5185m 995 1081 1050 887 Zinc ppm ASTM D5185m 1180 1376 1240 1198 Sulfur ppm ASTM D5185m 2600 2651 2523 2355 CONTAMINANTS method limit/base current history1 histor Silicon ppm ASTM D5185m >25 7 7 4 Sodium ppm ASTM D5185m 7 2 3		1	<1	2	0	ASTM D5185m	ppm	Manganese
Phosphorus ppm ASTM D5185m 995 1081 1050 887 Zinc ppm ASTM D5185m 1180 1376 1240 1198 Sulfur ppm ASTM D5185m 2600 2651 2523 2355 CONTAMINANTS method limit/base current history1 histor Silicon ppm ASTM D5185m >25 7 7 4 Sodium ppm ASTM D5185m 7 2 3		843	898	977	950	ASTM D5185m	ppm	Magnesium
Zinc ppm ASTM D5185m 1180 1376 1240 1198 Sulfur ppm ASTM D5185m 2600 2651 2523 2355 CONTAMINANTS method limit/base current history1 histor Silicon ppm ASTM D5185m >25 7 7 4 Sodium ppm ASTM D5185m 7 2 3		1172	1322	1388	1050	ASTM D5185m	ppm	Calcium
Sulfur ppm ASTM D5185m 2600 2651 2523 2355 CONTAMINANTS method limit/base current history1 history1 Silicon ppm ASTM D5185m >25 7 7 4 Sodium ppm ASTM D5185m 7 2 3		887	1050	1081	995	ASTM D5185m	ppm	Phosphorus
CONTAMINANTSmethodlimit/basecurrenthistory1historSiliconppmASTM D5185m<>25774SodiumppmASTM D5185m723		1198	1240	1376	1180	ASTM D5185m	ppm	Zinc
Silicon ppm ASTM D5185m >25 7 7 4 Sodium ppm ASTM D5185m 7 2 3		2355	2523	2651	2600	ASTM D5185m	ppm	Sulfur
Sodium ppm ASTM D5185m 7 2 3	ory2	history	history1	current	limit/base	method	TS	CONTAMINAN
				7	>25	ASTM D5185m	ppm	Silicon
Potassium ppm ASTM D5185m >20 58 61 43		3	2	7		ASTM D5185m	ppm	Sodium
		43	61	58	>20	ASTM D5185m	ppm	Potassium
	ory2	history	history1	current	limit/base			INFRA-RED
Soot % *ASTM D7844 >3 1.5 1.2 0.7		0.7	1.2	1.5	>3	*ASTM D7844	%	Soot %
Nitration Abs/cm *ASTM D7624 >20 12.7 11.0 8.8		8.8	11.0	12.7	>20	*ASTM D7624	Abs/cm	Nitration
Sulfation Abs/.1mm *ASTM D7415 >30 25.0 22.8 20.2		20.2	22.8	25.0	>30	*ASTM D7415	Abs/.1mm	Sulfation
FLUID DEGRADATION method limit/base current history1 histo	ory2	history	history1	current	limit/base	method	ATION	FLUID DEGRAD
Oxidation Abs/.1mm *ASTM D7414 >25 22.9 20.7 16.8		16.8	20.7	22.9	>25	*ASTM D7414	Abs/.1mm	Oxidation
Base Number (BN) mg KOH/g ASTM D2896 5.9 6.7 7.4		7.4	6.7	5.9		ASTM D2896	mg KOH/g	Base Number (BN)



OIL ANALYSIS REPORT





8

	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 Debris	scalar scalar	*Visual *Visual	NONE	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 PROPE	RTIES	method	limit/base	current	history1	history2
	Visc @ 100°C	cSt	ASTM D445	12.00	11.5	11.4	11.3
	GRAPHS						
	Iron (ppm)			10	Lead (ppm)		
	200 - Severe			80	Severe		
bpm	150			61 Ed. 4			
d	100 - Abnormal			41 	Abnormal		
	50			2			
	,53 123 10 123 10		/24	124	1	/23 -	4
	Jun29/23 0ct18/23		Mar2/24	Jun6/24 -	Jun29/23	0ct18/23 Mar2/24	
	Aluminum (ppm)				Chromium (p	pm)	
	80			50	Severe	1	
,	60 Smarn						
	40 Severe		1	e ³⁰	Abnormal		
	20 - Abnormal			10			
			24			23 - 4	
	Jun 29/23 0ct 18/23		Mar2/24	Jun6/24	Jun 29/23	0ct18/23 Mar2/24	
	Copper (ppm)				Silicon (ppm)	_	
	400 Severe			80	Severe	1	
	300			60			
bpm	200			튭 41	Abnomo		
	100-			2	Abnormal		
	0						
	Jun 29/23 0ct 18/23		Mar2/24	Jun6/24	Jun 29/23	0ct18/23 Mar2/24	4
	ੁੱ Viscosity @ 100°(_	2	Ţ	크 Base Number	o M	
		-]	·	
	14 Abnormal			(8)(HO) (8)(HO			
DoDo!	Base			в ш ы 4.0			
10	3 10 - Abnormal			qum ₂)		
				Base			
	9/23 +		2/24 -			8/23	-
	Jun 29/23 0ct 18/23		Mar2/24	Jun6/24	Jun29/23	0ct18/23 Mar2/24	

2196 BENNETT ROAD PHILADELPHIA, PA : 27 Jun 2024 - Wes Davis US 19116 Contact: ROSTY VITER rviter@millertransgroup.com T: (215)552-9832 Statements of conformity to specifications are based on the simple acceptance decision rule (JCGM 106:2012) F: (215)552-9892

Report Id: MILPHINE [WUSCAR] 06222045 (Generated: 06/27/2024 17:36:15) Rev: 1

Certificate 12367

Test Package : MOB 1 (Additional Tests: TBN)

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.

Tested

Diagnosed

: 27 Jun 2024

Lab Number : 06222045

Unique Number : 11100242

Contact/Location: ROSTY VITER - MILPHINE