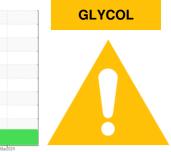


OIL ANALYSIS REPORT

Sample Rating Trend



Machine Id

513414 Component Diesel Engine Fluid PETRO CANADA DURON SHP 10W30 (--- GAL)

DIAGNOSIS

A Recommendation

We advise that you check for possible coolant leak. Check for low coolant level. We recommend an early resample to monitor this condition.

Wear

All component wear rates are normal.

Contamination

Sodium and/or potassium levels are high.

Fluid Condition

The BN result indicates that there is suitable alkalinity remaining in the oil.

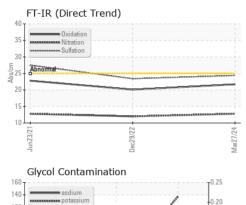
SAMPLE INFORI	MATION	method	limit/base	current	history1	history2
Sample Number		Client Info		PCA0121483	PCA0085217	PCA0053285
Sample Date		Client Info		27 Mar 2024	29 Dec 2022	23 Jun 2021
Machine Age	mls	Client Info		160469	105405	50554
Oil Age	mls	Client Info		160469	15000	50554
Oil Changed		Client Info		Not Changd	Changed	Changed
Sample Status				ABNORMAL	NORMAL	ABNORMAL
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
	-					
WEAR METAL	S	method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185m	>100	35	36	80
Chromium	ppm	ASTM D5185m	>20	1	2	4
Nickel	ppm	ASTM D5185m	>4	0	0	1
Titanium	ppm	ASTM D5185m		3	5	4
Silver	ppm	ASTM D5185m	>3	0	0	<1
Aluminum	ppm	ASTM D5185m	>20	16	16	28
Lead	ppm	ASTM D5185m	>40	0	0	<1
Copper	ppm	ASTM D5185m	>330	2	3	13
Tin	ppm	ASTM D5185m	>15	<1	<1	3
Antimony	ppm	ASTM D5185m				0
Vanadium	ppm	ASTM D5185m		0	0	<1
Cadmium	ppm	ASTM D5185m		0	0	0
ADDITIVES		method	limit/base	current	history1	history2
ADDITIVES Boron	ppm	method ASTM D5185m	limit/base	current 7	<mark>history1</mark> 0	history2 10
	ppm ppm					
Boron Barium	ppm	ASTM D5185m	2	7	0	10
Boron		ASTM D5185m ASTM D5185m	2 0	7 0	0	10 0
Boron Barium Molybdenum Manganese	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	2 0 50	7 0 63	0 0 51	10 0 57
Boron Barium Molybdenum	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	2 0 50 0 950	7 0 63 <1	0 0 51 <1	10 0 57 2
Boron Barium Molybdenum Manganese Magnesium Calcium	ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	2 0 50 0	7 0 63 <1 910	0 0 51 <1 750	10 0 57 2 957
Boron Barium Molybdenum Manganese Magnesium	ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	2 0 50 950 1050 995	7 0 63 <1 910 1188 1020	0 0 51 <1 750 1067 833	10 0 57 2 957 1270 1002
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus	ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	2 0 50 0 950 1050	7 0 63 <1 910 1188	0 0 51 <1 750 1067	10 0 57 2 957 1270
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	2 0 50 950 1050 995 1180	7 0 63 <1 910 1188 1020 1227	0 0 51 <1 750 1067 833 1022	10 0 57 2 957 1270 1002 1263
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	2 0 50 950 1050 995 1180 2600	7 0 63 <1 910 1188 1020 1227 3426	0 0 51 <1 750 1067 833 1022 2978	10 0 57 2 957 1270 1002 1263 2552
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN	ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	2 0 50 950 1050 995 1180 2600	7 0 63 <1 910 1188 1020 1227 3426 current	0 0 51 <1 750 1067 833 1022 2978 history1	10 0 57 2 957 1270 1002 1263 2552 history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon	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	2 0 50 950 1050 995 1180 2600	7 0 63 <1 910 1188 1020 1227 3426 current 5	0 0 51 <1 750 1067 833 1022 2978 history1 6	10 0 57 2 957 1270 1002 1263 2552 history2 7
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium	ppm ppm ppm ppm ppm ppm ppm ppm TS	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	2 0 50 0 950 1050 995 1180 2600 limit/base >25	7 0 63 <1 910 1188 1020 1227 3426 current 5 15	0 0 51 <1 750 1067 833 1022 2978 history1 6 2	10 0 57 2 957 1270 1002 1263 2552 history2 7 5
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium	ppm ppm ppm ppm ppm ppm ppm ppm TS	ASTM D5185m ASTM D5185m	2 0 50 0 950 1050 995 1180 2600 limit/base >25	7 0 63 <1 910 1188 1020 1227 3426 <u>current</u> 5 15 15 137	0 0 51 <1 750 1067 833 1022 2978 history1 6 2 2	10 0 57 2 957 1270 1002 1263 2552 history2 7 5 5 7
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Glycol	ppm ppm ppm ppm ppm ppm ppm ppm TS	ASTM D5185m ASTM D5185m	2 0 50 950 1050 995 1180 2600 limit/base >25 >20	7 0 63 <1 910 1188 1020 1227 3426 current 5 15 5 15 15 15 137 NEG	0 0 51 <1 750 1067 833 1022 2978 history1 6 2 2 21 NEG	10 0 57 2 957 1270 1002 1263 2552 history2 7 5 5 × 74 NEG
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Glycol INFRA-RED Soot %	ppm ppm ppm ppm ppm ppm ppm ppm TS ppm ppm ppm %	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m *ASTM D2982 method *ASTM D7844	2 0 50 0 950 1050 995 1180 2600 limit/base >25 >20 limit/base >3	7 0 63 <1 910 1188 1020 1227 3426 <u>current</u> 5 15 ≤ 137 NEG	0 0 51 <1 750 1067 833 1022 2978 history1 6 2 21 NEG history1 1.2	10 0 57 2 957 1270 1002 1263 2552 history2 7 5 5 74 NEG history2 1.1
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Glycol INFRA-RED	ppm ppm ppm ppm ppm ppm ppm ppm TS ppm ppm	ASTM D5185m ASTM D5185m *ASTM D2982	2 0 50 0 950 1050 995 1180 2600 limit/base >25 >20 limit/base >3	7 0 63 <1 910 1188 1020 1227 3426 current 5 15 15 15 15 15 137 NEG current 1.1	0 0 51 <1 750 1067 833 1022 2978 history1 6 2 21 NEG history1	10 0 57 2 957 1270 1002 1263 2552 history2 7 5 5 7 7 5 7 8 74 NEG
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Glycol INFRA-RED Soot % Nitration	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 *ASTM D2982 nethod *ASTM D7844 *ASTM D7844	2 0 50 950 1050 995 1180 2600 limit/base >25 >20 limit/base >3 >20	7 0 63 <1 910 1188 1020 1227 3426 current 5 15 5 15 15 137 NEG current 1.1 1.1	0 0 51 <1 750 1067 833 1022 2978 history1 6 2 21 NEG NEG history1 1.2 1.2	10 0 57 2 957 1270 1002 1263 2552 history2 7 5 5 7 7 5 7 8 74 NEG NEG 1.1 1.2.8
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Glycol INFRA-RED Soot % Nitration Sulfation	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 *ASTM D2982 nethod *ASTM D7844 *ASTM D7844	2 0 50 0 950 1050 995 1180 2600 I imit/base >25 >20 I imit/base >3 >20 >3 >20	7 0 63 <1 910 1188 1020 1227 3426 current 5 15 15 15 137 NEG current 1.1 1.1 12.8 24.4	0 0 51 <1 750 1067 833 1022 2978 history1 6 2 21 NEG history1 1.2 1.2 12.0 23.4	10 0 57 2 957 1270 1002 1263 2552 history2 7 5 5 74 NEG history2 1.1 1.2,8 27,5
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Glycol INFRA-RED Soot % Nitration Sulfation	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m *ASTM D2982 method *ASTM D7844 *ASTM D7844	2 0 50 0 950 1050 995 1180 2600 imit/base >25 >20 imit/base >3 >20 >30 imit/base	7 0 63 <1 910 1188 1020 1227 3426 current 5 15 15 15 15 15 137 NEG 1.1 1.1 12.8 24.4 current	0 0 51 <1 750 1067 833 1022 2978 history1 6 2 21 NEG 120 1.2 12.0 23.4 history1	10 0 57 2 957 1270 1002 1263 2552 history2 7 5 ↓ 74 NEG 1.1 NEG 1.1 12.8 27.5

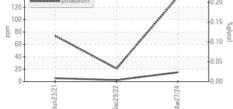
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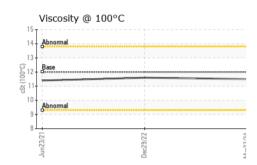
Contact/Location: ROSTY VITER - MILPHINE

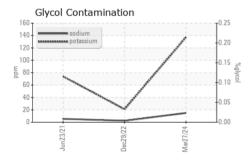


OIL ANALYSIS REPORT









VISUAL		method	limit/base	current	history1	history2
Vhite Metal	scalar	*Visual	NONE	NONE	NONE	NONE
ellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
recipitate	scalar	*Visual	NONE	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE	NONE
ebris	scalar	*Visual	NONE	NONE	NONE	NONE
and/Dirt	scalar	*Visual	NONE	NONE	NONE	NONE
ppearance	scalar	*Visual	NORML	NORML	NORML	NORML
)dor	scalar	*Visual	NORML	NORML	NORML	NORML
mulsified Water	scalar	*Visual	>0.2	NEG	NEG	NEG
ree Water	scalar	*Visual		NEG	NEG	NEG
FLUID PROPE	RTIES	method	limit/base	current	history1	history
′isc @ 100°C	cSt	ASTM D445	12.00	11.5	11.6	11.4
GRAPHS						
Iron (ppm)			100	Lead (ppm)		
Severe			100-	Severe		
			80.	- 0		
Abnormal			60- Ed 40	Abnormal		
	1		40.	- Q		
			20-			
3/21	1/22			3/21-	/22 -	
Jun23/2	Dec29/22		Mar27/24	Jun23/2	Dec29/22	
Aluminum (ppm)				Chromium (p	pm)	
Severe	1		40	Severe	1	
T			20			
Abnormal			E 20	Abnormal		
			10-			
			0.		_	
Jun23/21	Dec29/22		Mar27/24	Jun23/21	Dec29/22	
-	Dec		Ma		Dec	
Copper (ppm)			80	Silicon (ppm)		
Severe Abnormal						
			60			
			톱 40 ·	Ab		
			20.	Abnormal		
23/21	9/22 -			23/21	Dec29/22 -	
Jun23/2	Dec29/22		Mar27/24	Jun23/2		
Viscosity @ 100°C			8.0	Base Number		
Abnormal			()0, HOX 6.0- HOX 6.0- Builting ta 4.0- quilting 2.0- eeg			
Base			Bu			
			10 4.0			
Abnormal			₹ 2.0-			
-			0.0·			
2	Dec29/22		Mar27/24	Jun23/2	Dec29/22	
Jun23/2	2		12	2	1.7	

Laboratory Sample No. : PCA0121483 : 10 Apr 2024 Received 2196 BENNETT ROAD Lab Number : 06143824 : 12 Apr 2024 PHILADELPHIA, PA Tested Unique Number : 10968632 Diagnosed : 12 Apr 2024 - Jonathan Hester US 19116 Test Package : MOB 1 (Additional Tests: Glycol, TBN) Contact: ROSTY VITER Certificate 12367 rviter@millertransgroup.com To discuss this sample report, contact Customer Service at 1-800-237-1369. T: (215)552-9832 * - 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) F: (215)552-9892

Contact/Location: ROSTY VITER - MILPHINE