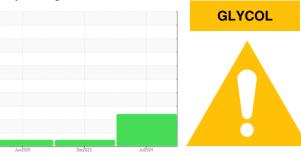


OIL ANALYSIS REPORT



Machine Id 513413

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

DIAGNOSIS

Recommendation

We advise that you check for the source of the 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

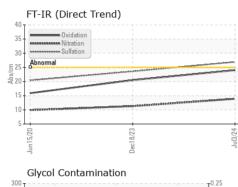
The BN result indicates that there is suitable alkalinity remaining in the oil.

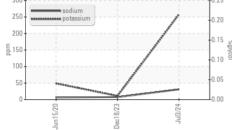
SAMPLE INFOR	MATION	method	limit/base	current	history1	history2
Sample Number		Client Info		PCA0129049	PCA0114610	PCA0026179
Sample Date		Client Info		03 Jul 2024	18 Dec 2023	15 Jun 2020
Machine Age	mls	Client Info		171347	224547	11280
Oil Age	mls	Client Info		171347	224547	11280
Oil Changed		Client Info		N/A	Changed	Changed
Sample Status				ABNORMAL	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
WEAR METAL	S	method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185m	>100	46	53	52
Chromium	ppm	ASTM D5185m	>20	2	2	1
Nickel	ppm	ASTM D5185m	>4	<1	1	1
Titanium	ppm	ASTM D5185m		3	1	0
Silver	ppm	ASTM D5185m	>3	0	0	0
Aluminum	ppm		>20	20	7	13
Lead	ppm	ASTM D5185m	>40	0	0	0
Copper	ppm		>330	4	11	20
Tin	ppm	ASTM D5185m	>15	1	2	2
Antimony	ppm	ASTM D5185m	210			0
Vanadium	ppm	ASTM D5185m		0	<1	0
Cadmium	ppm	ASTM D5185m		0	0	0
	lele			-		
ADDITIVES		method	limit/base	current	history1	history2
Boron	ppm	ASTM D5185m	2	8	6	63
Boron Barium	ppm ppm	ASTM D5185m ASTM D5185m	2 0	8 0	6 0	63 0
Boron Barium Molybdenum	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	2 0 50	8 0 65	6 0 59	63 0 9
Boron Barium Molybdenum Manganese	ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	2 0 50 0	8 0 65 <1	6 0 59 3	63 0 9 5
Boron Barium Molybdenum Manganese Magnesium	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	2 0 50 0 950	8 0 65 <1 935	6 0 59 3 865	63 0 9 5 692
Boron Barium Molybdenum Manganese Magnesium Calcium	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	2 0 50 0	8 0 65 <1	6 0 59 3	63 0 9 5 692 1339
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	2 0 50 950 1050 995	8 0 65 <1 935 1234 1089	6 0 59 3 865 1269 1002	63 0 9 5 692 1339 717
Boron Barium Molybdenum Manganese Magnesium Calcium	ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	2 0 50 0 950 1050	8 0 65 <1 935 1234	6 0 59 3 865 1269	63 0 9 5 692 1339
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur	ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	2 0 50 950 1050 995	8 0 65 <1 935 1234 1089	6 0 59 3 865 1269 1002	63 0 9 5 692 1339 717
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	8 0 65 <1 935 1234 1089 1346	6 0 59 3 865 1269 1002 1272	63 0 9 5 692 1339 717 771
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur	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	8 0 65 <1 935 1234 1089 1346 3816	6 0 59 3 865 1269 1002 1272 2826	63 0 9 5 692 1339 717 771 2103
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN	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	8 0 65 <1 935 1234 1089 1346 3816 current	6 0 59 3 865 1269 1002 1272 2826 history1	63 0 9 5 692 1339 717 771 2103 history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon	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	2 0 50 950 1050 995 1180 2600	8 0 65 <1 935 1234 1089 1346 3816 current 8	6 0 59 3 865 1269 1002 1272 2826 history1 10	63 0 9 5 692 1339 717 771 2103 history2 15
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 50 950 1050 995 1180 2600 Iimit/base >25	8 0 65 <1 935 1234 1089 1346 3816 <u>current</u> 8 & 31	6 0 59 3 865 1269 1002 1272 2826 history1 10 7	63 0 9 5 692 1339 717 771 2103 history2 15 6
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium	ppm ppm ppm ppm ppm ppm ppm ppm TS ppm ppm	ASTM D5185m ASTM D5185m	2 0 50 950 1050 995 1180 2600 Iimit/base >25	8 0 65 <1 935 1234 1089 1346 3816 <u>current</u> 8 ▲ 31 ▲ 258	6 0 59 3 865 1269 1002 1272 2826 history1 10 7 11	63 0 9 5 692 1339 717 771 2103 history2 15 6 49
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Glycol	ppm ppm ppm ppm ppm ppm ppm ppm TS ppm ppm	ASTM D5185m ASTM D2982	2 0 50 950 1050 995 1180 2600 limit/base >25 >20	8 0 65 <1 935 1234 1089 1346 3816 <u>current</u> 8 ▲ 31 ▲ 31 ▲ 258 NEG	6 0 59 3 865 1269 1002 1272 2826 history1 10 7 11 NEG	63 0 9 5 692 1339 717 771 2103 history2 15 6 49 NEG
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Glycol INFRA-RED	ppm ppm ppm ppm ppm ppm ppm TS ppm ppm ppm %	ASTM D5185m ASTM D5185m *ASTM D2982	2 0 50 0 950 1050 995 1180 2600 limit/base >25 >20	8 0 65 <1 935 1234 1089 1346 3816 current 8 38 258 NEG current	6 0 59 3 865 1269 1002 1272 2826 history1 10 7 11 NEG history1	63 0 9 5 692 1339 717 771 2103 history2 15 6 49 NEG history2
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 D2982 method *ASTM D7844 *ASTM D7844	2 0 50 0 950 1050 995 1180 2600 limit/base >25 >20 limit/base >3	8 0 65 <1 935 1234 1089 1346 3816 current 8 31 ≥58 NEG current 1.3	6 0 59 3 865 1269 1002 1272 2826 history1 10 7 11 10 7 11 NEG history1 1.1	63 0 9 5 692 1339 717 771 2103 history2 15 6 49 NEG history2 0.3
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Solicon Sodium Potassium Glycol INFRA-RED Soot % Nitration	ppm ppm ppm ppm ppm ppm ppm ppm TS 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 limit/base >25 >20 limit/base >3 >20	8 0 65 <1 935 1234 1089 1346 3816 current 8 ▲ 31 ▲ 31 ▲ 258 NEG current 1.3 13.9	6 0 59 3 865 1269 1002 1272 2826 history1 10 7 11 NEG history1 1.1 1.1 1.3	63 0 9 5 692 1339 717 771 2103 history2 15 6 49 NEG NEG history2 0.3 9.9
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 TS 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 Iimit/base >25 >20 Iimit/base >3 >20 >3 >20	8 0 65 <1 935 1234 1089 1346 3816 current 8 ▲ 31 258 NEG current 1.3 13.9 26.9	6 0 59 3 865 1269 1002 1272 2826 history1 10 7 11 NEG history1 1.1 1.1 1.1 23.6	63 0 9 5 692 1339 717 771 2103 history2 15 6 49 NEG history2 0.3 9.9 20.4
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 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	 8 0 65 <1 935 1234 1089 1346 3816 current 8 31 258 NEG current 1.3 13.9 26.9 current 	6 0 59 3 865 1269 1002 1272 2826 history1 10 7 11 NEG history1 1.1 1.1 1.3 23.6 history1	63 0 9 5 692 1339 717 771 2103 history2 15 6 49 NEG NEG history2 0.3 9.9 20.4 history2

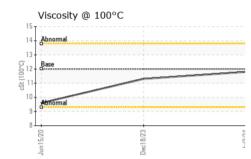
Contact/Location: ROSTY VITER - MILPHINE

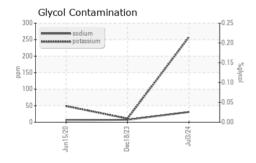


OIL ANALYSIS REPORT

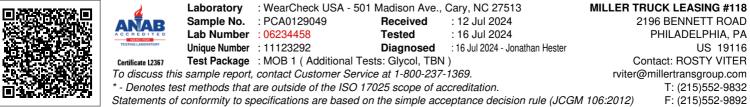








		method	limit/base	current	history1	history2
Vhite Metal	scalar	*Visual	NONE	NONE	NONE	NONE
ellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual	NONE	NONE	NONE	NONE
ppearance	scalar	*Visual	NORML	NORML	NORML	NORML
Ddor	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
/isc @ 100°C	cSt	ASTM D445	12.00	11.8	11.3	9.6
GRAPHS						
Iron (ppm)			100	Lead (ppm)		
Severe			100	Severe		
-			80	-		
Abnormal			60 Ed 40	Abnormal		
			20			
			0			
5/20 -	8/23 -		Jul3/24	5/20	8/23 -	
Jun15/20	Dec18/23		Jul	Jun15/20	Dec18/23	
Aluminum (ppm)				Chromium (p	pm)	
T '			50	Τ		
Severe			40	Severe		
Abnormal			30	Abnormal		
			20	- Q	*****	
			10			
	23		0 54		23	
Jun 15/20	Dec18/23		Jul3/24 .	Jun 15/20	Dec18/23	
∽ Copper (ppm)				Silicon (ppm)		
			80	Sincon (ppin)		
Severe Pabronmai			60			
1			<u>특</u> 40	Abnormal		
			20			
•			0			
	-		with the second s	0		
15,20	:18/23		ul3/24	15/20	18/2	
Jun 5/20	Dec18/23		Jul3/24	Jun 15/20	Dec18/23	
Viscosity @ 100°C	Dec18/23		80	Base Number		
	Dec18/23		80			
Viscosity @ 100°C	Dec18/23		80			
Viscosity @ 100°C	Dec18/23		80			
Viscosity @ 100°C	Dec18/23		80			
Viscosity @ 100°C			8.0 (0) (0) (0) (0) (0) (0) (0) (0) (0) (0	Base Number		
Abnormal Base	Deci 8/23 - Deci 8/23 -		(0)HOX But HOX			



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Contact/Location: ROSTY VITER - MILPHINE