

OIL ANALYSIS REPORT

Sample Rating Trend

FUEL



Machine Id FREIGHTLINER 484149 Component

Diesel Engine

PETRO CANADA DURON SHP 10W30 (20 QTS)

Sample Number Client Info PCA0114544 PCA0076768 PCA007325 Sample Date Client Info 27 Dec 2023 03 Nov 2022 29 Jun 2022 Jachine Age mis Client Info 401775 110984 18135 Dil Changed Client Info 0 110984 18135 Dil Changed Client Info Changed N/A Sample Status Client Info Changed N/A Sample Status method limit/base current history! Nistory! Water WC Method >0.2 NEG NEG NEG WEAR METALS method limit/base current history! history! Vican ASTM D51555 >20 <1	N SHP 10W30 (2	0 (15)	Dec2017 Oct2	018 May2020 Aug2020 Oct20	020 May2021 Mar2022 Jun2022 Nov2	022 Dec2023	
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Dil Changed Client Info Changed ABNORMAL Changed N/A Sample Status Image Image ABNORMAL ABNORMAL SEVERE CONTAMINATION method limit/base current history1 history2 Water WC Method >0.2 NEG NEG NEG WEAR METALS method limit/base current history1 history2 ron ppm ASTM D5185 >20 c1 1 2 Chromium ppm ASTM D5185 >20 c1 1 2 Nickel ppm ASTM D5185 >22 c1 0 0 Silver ppm ASTM D5185 >22 c1 2 2 1 Copper ppm ASTM D5185 >20 3 5 6 ead ppm ASTM D5185 >330 4 2 2 1 Vanadium ppm ASTM D5185 >330 4 2 2 1 Copper ppm ASTM D5185 >330 4 2 2 1 Changed ppm ASTM D5185 0 0 0 1 Change	Oil Age	mls	Client Info		0	110984	18135
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Calcium ppm ASTM D5185m 1050 1044 1187 955 Phosphorus ppm ASTM D5185m 995 950 898 751 Zinc ppm ASTM D5185m 1180 1197 1137 970 Sulfur ppm ASTM D5185m 2600 2913 3629 2766 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 5 6 6 Sodium ppm ASTM D5185m >20 13 24 15 Fuel % ASTM D5185m >20 13 3.7 14.5 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7624 >20 11.9 13.6 14.0 Sulfation Abs/.1mm *ASTM D7624 >20 11.9 13.6 14.0 Sulfation Abs/.1mm *ASTM D7415			ASTM D5185m	50	-		
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Potassium ppm ASTM D5185m >20 13 24 15 Fuel % ASTM D3524 >3.0 ▲ 4.8 ▲ 3.7 ● 14.5 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >6 0.8 0.9 0.8 Nitration Abs/cm *ASTM D7624 >20 11.9 13.6 14.0 Sulfation Abs/.1mm *ASTM D7615 >30 22.4 25.2 24.1 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 19.2 22.6 24.0	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	50 0 950 1050 995 1180 2600	54 <1 828 1044 950 1197 2913	55 <1 726 1187 898 1137 3629	50 <1 666 955 751 970 2766
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Soot % % *ASTM D7844 >6 0.8 0.9 0.8 Nitration Abs/cm *ASTM D7624 >20 11.9 13.6 14.0 Sulfation Abs/.1mm *ASTM D7415 >30 22.4 25.2 24.1 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 19.2 22.6 24.0	Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium	ppm ppm ppm ppm ppm ppm ppm TS	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m method ASTM D5185m ASTM D5185m	50 0 950 1050 995 1180 2600 limit/base >25	54 <1 828 1044 950 1197 2913 current 5 23	55 <1 726 1187 898 1137 3629 history1 6 55	50 <1 666 955 751 970 2766 history2 6 9
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Sulfation Abs/.1mm *ASTM D7415 >30 22.4 25.2 24.1 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 19.2 22.6 24.0	Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Silicon Sodium Potassium Fuel INFRA-RED	ppm ppm ppm ppm ppm ppm ppm TS ppm ppm ppm	ASTM D5185m ASTM D3524	50 0 950 1050 995 1180 2600 limit/base >25 >20 >3.0 limit/base	54 <1 828 1044 950 1197 2913 current 5 23 13 € 4.8 current	55 <1 726 1187 898 1137 3629 history1 6 55 24 ▲ 3.7 history1	50 <1 666 955 751 970 2766 history2 6 9 15 € 14.5 history2
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	Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Fuel INFRA-RED Soot % Nitration	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D3524 method *ASTM D7844	50 0 950 1050 995 1180 2600 limit/base >25 >20 >3.0 limit/base >6 >20	54 <1 828 1044 950 1197 2913 <urrent 5 23 13 ▲ 4.8 <urrent 0.8 11.9</urrent </urrent 	55 <1 726 1187 898 1137 3629 history1 6 55 24 ▲ 3.7 history1 0.9 13.6	50 <1 666 955 751 970 2766 history2 6 9 15 € 14.5 history2 0.8 14.0
	Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Fuel 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 D3524 *ASTM D7844 *ASTM D7624	50 0 950 1050 995 1180 2600 Iimit/base >25 >20 >3.0 Iimit/base >6 >20 >3.0	54 <1 828 1044 950 1197 2913 current 5 23 13 € 4.8 current 0.8 11.9 22.4	55 <1 726 1187 898 1137 3629 history1 6 55 24 ▲ 3.7 history1 0.9 13.6 25.2	50 <1 666 955 751 970 2766 history2 6 9 15 € 14.5 history2 0.8 14.0 24.1
	Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Fuel INFRA-RED Soot % Nitration Sulfation FLUID DEGRAI	ppm ppm ppm ppm ppm ppm ppm TS ppm ppm ppm % % Abs/cm Abs/cm	ASTM D5185m ASTM D3524 method *ASTM D7844 *ASTM D7624 *ASTM D7415	50 0 950 1050 995 1180 2600 imit/base >25 >20 >20 >20 >20 >20 >30 imit/base	54 <1 828 1044 950 1197 2913 <urrent 5 23 13 ▲ 4.8 <urrent 0.8 11.9 22.4 <urrent< td=""><td>55 <1 726 1187 898 1137 3629 history1 6 55 24 ▲ 3.7 history1 0.9 13.6 25.2 history1</td><td>50 <1 666 955 751 970 2766 history2 6 9 15 € 14.5 history2 0.8 14.0 24.1 history2</td></urrent<></urrent </urrent 	55 <1 726 1187 898 1137 3629 history1 6 55 24 ▲ 3.7 history1 0.9 13.6 25.2 history1	50 <1 666 955 751 970 2766 history2 6 9 15 € 14.5 history2 0.8 14.0 24.1 history2

Recommendation

The oil change at the time of sampling has been noted. We recommend an early resample to monitor this condition.

Wear

All component wear rates are normal.

Contamination

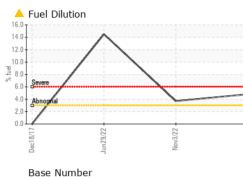
There is a moderate amount of fuel present in the oil. Tests confirm the presence of fuel in the oil.

Fluid Condition

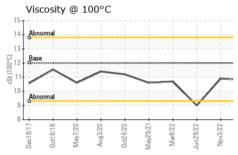
The BN result indicates that there is suitable alkalinity remaining in the oil. The oil is no longer serviceable due to the presence of contaminants.



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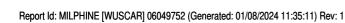


White Metal Yellow Metal	scalar scalar	*Visual	NONE		NONE				F				
	agalar					NONE		NONE			NONE		
Due sinitate	Scalar	*Visual	NONE		NONE			NON	E		NO	NE	
Precipitate	scalar	*Visual	NONE		NONE			NON	Е		NO	NE	
Silt	scalar	*Visual	NONE		NONE			NON	E		NO	NE	
Debris	scalar	*Visual	NONE		NONE			NON	E		NO	NE	
Sand/Dirt	scalar	*Visual	NONE		NONE			NON	E		NO	NE	
Appearance	scalar		NORML		NORM	1L		NOR	ML		NO	RML	
0.001	scalar		NORML		NORM	1L		NOR	ML				
	scalar		>0.2		NEG								
Free Water	scalar	*Visual			NEG			NEG			NE	G	
FLUID PROPE	RTIES	method	limit/base	e	curr	ent		hist	tory1		hi	story	2
Visc @ 100°C	cSt	ASTM D445	12.00		10.8			10.9			9		
GRAPHS													
Iron (ppm)				Lead (p	pm)								
250				¹⁰⁰	Severe			·			1		
200	1		1		Gevere	1	1		I I	1	1	I I	
E ¹⁵⁰			udo		Abnormal								
The second secon		-		40	0								
			-										
	4/20 - 9/21 -	8/22 - 9/22 -	7/23		8/17-	7/20	3/20 -	4/20	9/21-	8/22	9/22 -	3/22	200
Dec1 May Aug	0ct2	Mari Jun2: Nov:	Dec2		Dec1	May	Aug	0ct2	May2	Mari	Jun2	Nov	CC/2020
Aluminum (ppm)					Chromi	um (ppm)					
60 F0	1 1			⁵⁰ T	Severe			-			1		
Severa	1					1	1		1	1	1	1	
5.30				E 30 -	Abnormal								
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: PCA0114544 F : 06049752 F : 10815701 F	Recieveo Diagnoso Diagnost	l : 03 . ed : 05 . ician : We	Jan 2024 Jan 2024 s Davis	513		r	MILL	2	2196 PH	BEN IILA[NET DELP US	T RC HIA, § 19	DA P. 11
	Appearance Odor Emulsified Water Free Water FLUID PROPE Visc @ 100°C GRAPHS Iron (ppm) Copper (ppm) Copper (ppm) Copper (ppm) Viscosity @ 100°C Copper (ppm) Copper (ppm) Viscosity @ 100°C Copper (ppm) Copper (p	Appearance scalar Emulsified Water scalar Free Water scalar Free Water scalar FLUID PROPERTIES Visc @ 100°C cSt GRAPHS Iron (ppm)	Appearance scalar *Visual Odor scalar *Visual Emulsified Water scalar *Visual Free Water scalar *Visual Free Water scalar *Visual FLUID PROPERTIES method Visc @ 100°C cSt ASTM D445 GRAPHS Iron (ppm) Aluminum (ppm) Aluminum (ppm) Copper (ppm)	Appearance scalar *Visual NORML Odor scalar *Visual NORML Emulsified Water scalar *Visual >0.2 Free Water scalar *Visual >0.2 Free Water scalar *Visual >0.2 Free Water scalar *Visual FLUID PROPERTIES method limit/bas Visc @ 100°C cSt ASTM D445 12.00 GRAPHS Iron (ppm) Aluminum (ppm) Aluminum (ppm) Copper (ppm) Copper (ppm) Viscosity @ 100°C Viscosity @ 100°C *Viscosity @ 100°C	Appearance scalar *Visual NORML Emulsified Water scalar *Visual >0.2 Free Water scalar *Visual >0.2 Aluminum (ppm) Aluminum (ppm) Aluminum (ppm) Copper (ppm) Viscosity @ 100°C Copper (ppm) Viscosity @ 100°C Copper (ppm) Aluminum (ppm) Copper (ppm) Model (Copper (ppm)) Copper (ppm) Copper (ppm) Cop	Appearance scalar *Visual NORML NORM Emulsified Water scalar *Visual >0.2 NEG Free Water scalar *Visual >0.2 NEG Free Water scalar *Visual >0.2 NEG Tree Water scalar *Visual >0.2 NEG Scalar *Visual *Com Scalar *Com Scalar *Visual *Com Scalar *Visual *Com Scalar *Visual *Com Scalar *Com Scalar *Visual *Com Scalar *Com Sca	Appearance scalar *Visual NORML NORML MORML Emulsified Water scalar *Visual NORML NORML Emulsified Water scalar *Visual NORML NORML Free Water scalar *Visual NORML NORML Free Water scalar *Visual NORML	Appearance scalar 'Visual NORML NORML Appearance scalar 'Visual NORML NORML Emulsified Water scalar 'Visual NORML NORML Emulsified Water scalar 'Visual NORML NORML Emulsified Water scalar 'Visual NORML NORML FLUID PROPERTIES method imit/base current Visc @ 100°C cSt ASTM D445 12.00 10.8 GRAPHS Tron (ppm) Aluminum (ppm) Aluminum (ppm) Copper (ppm) (opper (ppm) (opper (ppm)) (opper	Appearance scalar Visual NORML NORML NOR Emulsified Water scalar Visual >0.2 NEG NEG Free Water scalar Visual >0.2 NEG NEG Free Water scalar Visual 0.9 CRAPHS Tron (ppm) Aluminum (ppm) Copper (ppm) Co	Appearance scalar Visual NORML NORML NORML NORML NORML Emulsified Water scalar Visual >0.2 NEG NEG Free Water scalar Visual >0.2 NEG	Appearance scalar Visual NORML	Appearance scalar Visual NORML	Appearance scalar 'Visual NORML NORM

* - 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)

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