

OIL ANALYSIS REPORT

Sample Rating Trend



Machine Id 503927

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

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 (Al) 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.

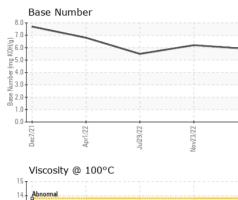
Fluid Condition

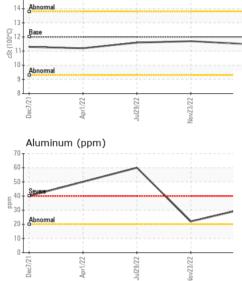
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

SAMPLE INFORMATIO Sample Number Sample Date mls Machine Age mls Oil Age mls Oil Age mls Oil Changed sample Status CONTAMINATION Fuel Glycol mls VEAR METALS ppm Chromium ppm Nickel ppm Nickel ppm Sample Status ppm Chromium ppm Silver ppm Aluminum ppm Lead ppm Copper ppm Cadmium ppm Boron ppm Manganese ppm Manganese ppm Magnesium ppm Zinc ppm Sulfur ppm Sulfur ppm Sodium ppm NortAALINAANTOR ppm Magnesium ppm Sulfur ppm Sodium ppm NFRA-RED ppm	Client Info Client Info Client Info Client Info Client Info Client Info WC Method WC Method WC Method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	>20 >40	Current PCA0101365 17 Jul 2023 149348 0 Changed NORMAL 4 Current 36 4 0 36 4 0 31 31 31 31 31 31 31 31 31 31 31 31 31	history1 PCA0083592 23 Nov 2022 121825 0 N/A NORMAL history1 <1.0 NEG 17 3 0 <17 3 0 <17 3 0 <17 3 0 <17 0 <10 0 <1 0 0 <10 0 0 <10 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	history2 PCA007717 29 Jul 2022 108759 0 Changed NORMAL 4 1.0 NEG 47 6 0 0 47 6 0 0 <1 6 6 0 <1 6 6 0 <1 6 6 0 <1 6 6 0 0 0 <1 6 0 0 0 <1 6 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
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Oil AgemlsOil ChangedSample StatusCONTAMINATIONFuelGlycolWEAR METALSIronppmChromiumppmNickelppmNickelppmSilverppmAluminumppmLeadppmCopperppmTinppmCadmiumppmBoronppmBariumppmMalganeseppmMagnesiumppmCalciumppmZincppmSulfurppmSulfurppmSodiumppmSodiumppmPotassiumppmPotassiumppmPotassiumppm	Client Info Client Info Client Info WC Method WC Method WC Method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	>5 limit/base >100 >20 >4 >3 >20 >40 >330 >15	0 Changed NORMAL < current <1.0 NEG Current 36 4 0 <1 0 31 <1 24 1 24 1 1 <1 24 1 0	0 N/A NORMAL 41.0 NEG history1 17 3 0 0 0 <1 22 <1 18 <1 18 <1 0 0	0 Changed NORMAL 41.0 NEG history2 47 6 0 0 47 6 0 0 <1 60 <1 60 <1 66 2 2 0
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Sample StatusCONTAMINATIONFuelGlycolWEAR METALSIronppmChromiumNickelppmTitaniumppmSilverppmAluminumppmLeadppmCopperppmTinppmCadmiumppmBoronppmBariumppmManganeseppmMagnesiumppmCalciumppmPhosphorusppmZincppmSulfurppmSulfurppmSodiumppmPotassiumppmPotassiumppm	method WC Method WC Method MC Method ASTM D5185m ASTM D5185m	>5 limit/base >100 >20 >4 >3 >20 >40 >330 >15	NORMAL current <1.0 NEG Current 36 4 0 <1 0 31 <1 24 1 <1 0 <1 0 31 <1 24 1 0 0 31 <1 0 31 <1 0 31 <1 0 31 <1 0 31 <1 0 31 <1 0 31 <1 0 31 <1 0 31 <1 0 31 <1 0 31 <1 0 31 <1 0 31 <1 0 31 <1 0 31 <1 0 31 <1 0 31 <1 0 31 <1 0 31 <1 0 31 31 31 31 31 31 31 31 31 31	NORMAL history1 <1.0 NEG history1 17 3 0 0 0 <1 22 <1 22 <1 18 <1 18 <1 0 0	NORMAL history2 <1.0 NEG history2 47 6 0 0 <1 60 <1 60 <1 66 2 0 0
CONTAMINATIONFuelIGlycolIWEAR METALSIronppmChromiumppmNickelppmNickelppmSilverppmAluminumppmLeadppmCopperppmTinppmCadmiumppmBoronppmBariumppmMalybdenumppmMagnesiumppmCalciumppmSulfurppmSulfurppmSodiumppmSodiumppmSodiumppmPotassiumppmPotassiumppmPotassiumppmPotassiumppmPotassiumppmPotassiumppm	WC Method WC Method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	>5 limit/base >100 >20 >4 >3 >20 >40 >330 >15	current <1.0	history1 <1.0	history2 <1.0
FuelGlycolImage: Select and Selec	WC Method WC Method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	>5 limit/base >100 >20 >4 >3 >20 >40 >330 >15	<1.0 NEG 36 4 0 <1 0 31 <1 24 1 24 1 <1 0	<1.0 NEG history1 17 3 0 0 <1 22 <1 18 <1 0 0	<1.0 NEG history2 47 6 0 0 <1 60 <1 60 <1 66 2 0
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WEAR METALSIronppmChromiumppmChromiumppmNickelppmTitaniumppmSilverppmAluminumppmLeadppmCopperppmCadmiumppmCadmiumppmBoronppmBariumppmMalganeseppmMagnesiumppmCalciumppmZincppmSulfurppmSodiumppmSodiumppmPotassiumppmPotassiumppmPotassiumppm	methodASTM D5185mASTM D5185m	>100 >20 >4 >3 >20 >40 >330 >15	current 36 4 0 <1	history1 17 3 0 0 <1 22 <1 18 <1 0	history2 47 6 0 0 <1 60 <1 66 2 0
Iron ppm Chromium ppm Nickel ppm Titanium ppm Silver ppm Aluminum ppm Lead ppm Copper ppm Copper ppm Tin ppm Cadmium ppm Cadmium ppm ADDITIVES Boron ppm Barium ppm Molybdenum ppm Manganese ppm Manganese ppm Calcium ppm Calcium ppm Suffur ppm Suffur ppm Suffur ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	>100 >20 >4 >3 >20 >40 >330 >15	36 4 0 <1 0 31 <1 24 1 <1 24 1 0	17 3 0 0 <1 22 <1 18 <1 0	47 6 0 0 <1 60 <1 66 2 0
ChromiumppmChromiumppmNickelppmNickelppmSilverppmSilverppmAluminumppmLeadppmCopperppmCopperppmCadmiumppmCadmiumppmBoronppmBariumppmMalganeseppmMagnesiumppmCalciumppmZincppmSulfurppmSodiumppmSodiumppmPotassiumppmPotassiumppmPotassiumppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	>20 >4 >3 >20 >40 >330 >15	4 0 <1 0 31 <1 24 1 <1 0	3 0 <1 22 <1 18 <1 0	6 0 <1 60 <1 66 2 0
NickelppmNickelppmTitaniumppmSilverppmAluminumppmLeadppmCopperppmTinppmVanadiumppmCadmiumppmADDITIVESBoronppmBariumppmMalganeseppmMagnesiumppmCalciumppmZincppmSulfurppmSulfurppmSodiumppmPotassiumppmppmppmSodiumppmPotassiumppmPotassiumppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	>4 >3 >20 >40 >330 >15	0 <1 0 31 <1 24 1 <1 0	0 0 <1 22 <1 18 <1 0	0 0 <1 60 <1 66 2 0
Titanium ppm Silver ppm Aluminum ppm Lead ppm Copper ppm Tin ppm Cadmium ppm Cadmium ppm ADDITIVES Boron ppm Barium ppm Molybdenum ppm Manganese ppm Manganese ppm Calcium ppm Calcium ppm Calcium ppm Sulfur ppm Sulfur ppm Sulfur ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	>3 >20 >40 >330 >15	<1 0 31 <1 24 1 <1 0	0 <1 22 <1 18 <1 0	0 <1 60 <1 66 2 0
Silver ppm Aluminum ppm Lead ppm Copper ppm Tin ppm Vanadium ppm Cadmium ppm ADDITIVES Boron ppm Barium ppm Molybdenum ppm Manganese ppm Manganese ppm Zinc ppm Sulfur ppm Sulfur ppm Sulfur ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	>20 >40 >330 >15	0 31 <1 24 1 <1 0	<1 22 <1 18 <1 0	<1 60 <1 66 2 0
AluminumppmAluminumppmLeadppmCopperppmTinppmVanadiumppmCadmiumppmCadmiumppmBoronppmBariumppmMolybdenumppmMagnesiumppmCalciumppmZincppmSulfurppmSulfurppmSodiumppmSodiumppmPotassiumppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	>20 >40 >330 >15	31 <1 24 1 <1 0	22 <1 18 <1 0	60 <1 66 2 0
LeadppmCopperppmTinppmVanadiumppmCadmiumppmCadmiumppmADDITIVESppmBoronppmMalphariumppmManganeseppmMagnesiumppmCalciumppmPhosphorusppmSulfurppmSulfurppmSodiumppmPotassiumppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	>40 >330 >15	<1 24 1 <1 0	<1 18 <1 0	<1 66 2 0
CopperppmCopperppmTinppmVanadiumppmCadmiumppmCadmiumppmADDITIVESBoronppmBariumppmMalganeseppmMagnesiumppmCalciumppmPhosphorusppmSulfurppmSulfurppmSodiumppmSodiumppmPotassiumppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	>330 >15	24 1 <1 0	18 <1 0	66 2 0
TinppmVanadiumppmCadmiumppmCadmiumppmADDITIVESppmBoronppmBariumppmMalybdenumppmMagnesiumppmCalciumppmPhosphorusppmZincppmSulfurppmCONTAMINANTSSiliconppmSodiumppmPotassiumppm	ASTM D5185m ASTM D5185m ASTM D5185m	>15	1 <1 0	<1 0	2 0
VanadiumppmCadmiumppmCadmiumppmADDITIVESBoronppmBariumppmMolybdenumppmMagnesiumppmCalciumppmPhosphorusppmZincppmSulfurppmCONTAMINANTSSiliconppmSodiumppmPotassiumppm	ASTM D5185m ASTM D5185m		<1 0	0	0
CadmiumppmADDITIVESBoronppmBariumppmMolybdenumppmManganeseppmMagnesiumppmCalciumppmPhosphorusppmZincppmSulfurppmCONTAMINANTSSiliconppmSodiumppmPotassiumppm	ASTM D5185m	limit/base	0		
ADDITIVESBoronppmBariumppmMolybdenumppmManganeseppmMagnesiumppmCalciumppmPhosphorusppmZincppmSulfurppmCONTAMINANTSSiliconppmSodiumppmPotassiumppm		limit/base	-	0	0
Boron ppm Barium ppm Molybdenum ppm Manganese ppm Calcium ppm Calcium ppm Calcium ppm Zinc ppm Sulfur ppm Sulfur ppm Sodium ppm		limit/base			
Barium ppm Molybdenum ppm Manganese ppm Magnesium ppm Calcium ppm Calcium ppm Zinc ppm Sulfur ppm Sulfur ppm Sulfur ppm Sodium ppm Potassium ppm	method			history1	history2
Molybdenum ppm Manganese ppm Magnesium ppm Calcium ppm Zinc ppm Sulfur ppm CONTAMINANTS Silicon ppm Sodium ppm Potassium ppm	ASTM D5185m	2	5	2	6
ManganeseppmMagnesiumppmCalciumppmPhosphorusppmZincppmSulfurppmCONTAMINANTSSiliconppmSodiumppmPotassiumppm	ASTM D5185m		0	0	0
MagnesiumppmCalciumppmPhosphorusppmZincppmSulfurppmCONTAMINANTSSiliconppmSodiumppmPotassiumppm	ASTM D5185m	50	68	65	60
CalciumppmPhosphorusppmZincppmSulfurppmCONTAMINANTSSiliconppmSodiumppmPotassiumppm	ASTM D5185m		<1	<1	1
PhosphorusppmZincppmSulfurppmCONTAMINANTSSiliconSodiumppmPotassiumppm	ASTM D5185m	950	986	947	869
Zinc ppm Sulfur ppm CONTAMINANTS Silicon ppm Sodium ppm Potassium ppm	ASTM D5185m	1050	1219	1160	1162
Sulfur ppm CONTAMINANTS Silicon ppm Sodium ppm Potassium ppm	ASTM D5185m	995	996	1013	958
CONTAMINANTSSiliconppmSodiumppmPotassiumppm	ASTM D5185m ASTM D5185m		1255 2917	1288 3483	1214 2258
Silicon ppm Sodium ppm Potassium ppm	method	limit/base	current	history1	history2
Sodium ppm Potassium ppm	ASTM D5185m		4	2	5
Potassium ppm	ASTM D5185m	~	3	1	3
INFRA-RED	ASTM D5185m	>20	55	35	103
	method	limit/base	current	history1	history2
Soot % %	*ASTM D7844	>3	0.8	0.1	0.9
Nitration Abs/cn		>20	9.9	11.9	11.9
Sulfation Abs/.1mr		>30	22.7	24.4	24.7
FLUID DEGRADATIO		limit/base	current	history1	history2
Oxidation Abs/.1mr	*ASTM D7415	iiiiii/base			



OIL ANALYSIS REPORT





	VISUAL		method				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	scalar	*Visual	NONE	NONE	NONE	NONE
	Debris	scalar	*Visual	NONE	NONE	NONE	NONE
	Sand/Dirt	scalar	*Visual	NONE	NONE	NONE	NONE
Jul29/22 . Vov23/22 .	Appearance	scalar	*Visual	NORML	NORML	NORML	NORML
Jul29/22 Nov23/22	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	11.7	11.6
	GRAPHS						
	Iron (ppm)			1	Lead (ppm)		
22	250 Severe		1		80 Severe		
Jul29/22 Nov23/22					60		
, z	a 150 a 100 - Abnormal			E.	40 Abnormal	1	
	50-				20 -		
~		-2	2+			5	2
	Dec7/21 Apr1/22	Jul29/22	Nov23/22	Jul17/23	Dec7/21 Apr1/22	Jul29/22	Nov23/22
		JL	No	٦٢			No
	Aluminum (ppm)				Chromium (p	pm)	
	60 -				40 Severe	1	
					30 -		
Jul29/22	E 40 - Severe			mdd	20 - Abnormal		
Jul2 Nov2	20 - Abnormal	1			10-		
	0						
	Dec7/21 Apr1/22	Jul29/22	Nov23/22	Jul17/23	Dec7/21 Apr1/22	Jul29/22	Nov23/22
		٦٢	No	٦٢		٦٢	No
	Copper (ppm)	1			Silicon (ppm)		
	300 -				60 -		
	틆 200			d	40		
	100-				20 - Abnormal		
	Dec7/21	Jul29/22 +	Nov23/22 -	Jul17/23	Dec7/21	Jul29/22 -	Vov23/22
		-	Nov2	Jult	Dec	Jul2	Nav2
	Viscosity @ 100°C				Base Number	r	
	14 Abnormal			Base Number (mg KOH/g)	5.0		
	(0-00 12 - Base tg			Bw)			
				nm ber			
	10 Abnormal			ase N	2.0 -		
	228	22	22+-).0 +	22	22
	Dec7/21 Apr1/22	Jul29/22	Nov23/22	Jul17/23	Dec7/21 Apr1/22	Jul29/22	Nov23/22
Laboratory Sample No. Lab Number	: 05903035	01 Madis Received Diagnose Diagnosti	: 20 J	ry, NC 275 ⁻ Jul 2023 Jul 2023 s Davis	13 M	ILLER TRUCK 39 INE HASBROUCE	DUSTRIAL A
Unique Numbe	e : MOB 1 (Additional T						

Report Id: MILRUT [WUSCAR] 05903035 (Generated: 07/20/2023 16:32:16) Rev: 1

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