

OIL ANALYSIS REPORT

Sample Rating Trend

Feb2019 Jun2018 Apr2022 Dec2022 Jan2023 Sep2

NORMAL



428047-402364

Component Diesel Engine Fluid

PETRO CANADA DURON SHP 15W40 (--- GAL)

DIAGNOSIS	

Recommendation

Resample at the next service interval to monitor.

Wear

Metal levels are typical for a new component breaking in.

Contamination

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 GFL0046122 GFL0046123 GFL0039525 Sample Date Client Info 10 Nov 2023 19 Sep 2023 24 Jan 2023 Machine Age hrs Client Info 450 600 450 Oil Age hrs Client Info 450 600 450 Oil Changed Client Info Not Changed Changed Changed Changed Sample Status Imit/base current history1 history2 Fuel WC Method >3.0 <1.0 <1.0 <1.0 Glycol WC Method >3.0 <1.0 Nicory1 history1 Inon ppm ASTM 05185m >2.0 0 0 <1.0 Nickel ppm ASTM 05185m >2.0 0 0 0 Silver ppm ASTM 05185m >2.0 1 1 2 Land ppm ASTM 05185m >2.0 1 0 0 Silver ppm	SAMPLE INFORM	MATION	method	limit/base	current	history1	history2
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Potassium ppm ASTM D5185m >20 0 18 3 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >4 0.2 0.4 0.4 Nitration Abs/cm *ASTM D7624 >20 7.1 9.9 11.5 Sulfation Abs/.1mm *ASTM D7415 >30 19.0 22.7 24.6 FLUID DEGRADATION method limit/base current history1 history2	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	0 0 60 0 1010 1070 1150 1270 2060	5 0 58 0 860 1021 978 1194 2844	3 12 63 0 834 1298 954 1151 2923	2 0 66 <1 837 1223 957 1235 2526
INFRA-REDmethodlimit/basecurrenthistory1history2Soot %%*ASTM D7844>40.20.40.4NitrationAbs/cm*ASTM D7624>207.19.911.5SulfationAbs/.1mm*ASTM D7415>3019.022.724.6FLUID DEGRADATIONmethodlimit/basecurrenthistory1history2	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	0 0 60 1010 1070 1150 1270 2060	5 0 58 0 860 1021 978 1194 2844 current	3 12 63 0 834 1298 954 1151 2923 history1	2 0 66 <1 837 1223 957 1235 2526 history2
Soot % % *ASTM D7844 >4 0.2 0.4 0.4 Nitration Abs/cm *ASTM D7624 >20 7.1 9.9 11.5 Sulfation Abs/.1mm *ASTM D7415 >30 19.0 22.7 24.6 FLUID DEGRADATION method limit/base current history1 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	0 0 60 1010 1070 1150 1270 2060	5 0 58 0 860 1021 978 1194 2844 2844 current 4	3 12 63 0 834 1298 954 1151 2923 history1 5	2 0 66 <1 837 1223 957 1235 2526 history2 6
Nitration Abs/cm *ASTM D7624 >20 7.1 9.9 11.5 Sulfation Abs/.1mm *ASTM D7415 >30 19.0 22.7 24.6 FLUID DEGRADATION method limit/base current history1 history2	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 method ASTM D5185m	0 0 60 0 1010 1070 1150 1270 2060 limit/base	5 0 58 0 860 1021 978 1194 2844 2844 <u>current</u> 4 2	3 12 63 0 834 1298 954 1151 2923 history1 5 11	2 0 66 <1 837 1223 957 1235 2526 history2 6 13
Sulfation Abs/.1mm *ASTM D7415 >30 19.0 22.7 24.6 FLUID DEGRADATION method limit/base current history1 history2	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	0 0 60 0 1010 1070 1150 1270 2060 limit/base >25 >20	5 0 58 0 860 1021 978 1194 2844 current 4 2 2 0	3 12 63 0 834 1298 954 1151 2923 history1 5 11 18	2 0 66 <1 837 1223 957 1235 2526 history2 6 13 3
FLUID DEGRADATION method limit/base current history1 history2	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 2060 225 >25	5 0 58 0 860 1021 978 1194 2844 current 4 2 2 0 0 current	3 12 63 0 834 1298 954 1151 2923 history1 5 11 18 history1	2 0 66 <1 837 1223 957 1235 2526 history2 6 13 3 }
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Oxidation Abs/.1mm *ASTM D7414 >25 15.0 18.7 20.5	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % Nitration	ppm ppm ppm ppm ppm ppm ppm ppm TS ppm ppm ppm	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 <i>limit/base</i> >25 >20 <i>limit/base</i> >4 >20	5 0 58 0 860 1021 978 1194 2844 <i>current</i> 4 2 2 0 <i>current</i> 0.2 7.1	3 12 63 0 834 1298 954 1151 2923 history1 5 11 18 history1 0.4 9.9	2 0 66 <1 837 1223 957 1235 2526 history2 6 13 3 history2 0.4 11.5
	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 imit/base >25 20 imit/base >4 >20	5 0 58 0 860 1021 978 1194 2844 <u>current</u> 4 2 2 0 <u>current</u> 0.2 7.1 19.0	3 12 63 0 834 1298 954 1151 2923 history1 5 11 18 history1 0.4 9.9 22.7	2 0 66 <1 837 1223 957 1235 2526 history2 6 13 3 history2 0.4 11.5 24.6
Base Number (BN) mg KOH/g ASTM D2896 9.8 7.7 5.5 4.4	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation	ppm ppm ppm ppm ppm ppm ppm TS ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D7844 *ASTM D7844	0 0 0 1010 1070 1150 1270 2060 2060 225 20 225 220 220 220 220 230 20 20 20 20 20 20 20 20 20 20 20 20 20	5 0 58 0 860 1021 978 1194 2844 <i>current</i> 4 2 2 0 <i>current</i> 0.2 7.1 19.0 <i>current</i>	3 12 63 0 834 1298 954 1151 2923 history1 5 11 18 history1 0.4 9.9 22.7 history1	2 0 66 <1 837 1223 957 1235 2526 history2 6 13 3 history2 0.4 11.5 24.6 history2



() 16 () 15 14 Base

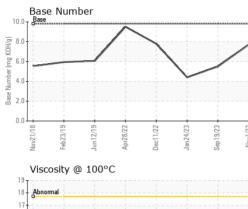
> 13 Abnormal 12 11

Nov21/18

Feb23/19

OIL ANALYSIS REPORT

VISUAL



Jun12/19

	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
Aquicu/122 Jan 24/23 Sep 19/23 Nov1/23	Appearance	scalar	*Visual	NORML	NORML	NORML	NORML
Janá Sep ¹	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	ERTIES	method	limit/base	current	history1	history2
	Visc @ 100°C	cSt	ASTM D445	15.4	13.6	13.5	13.7
	GRAPHS						
	Ferrous Alloys	_					
Apriculus Deci 1/22 Jan 24/23 Sep 19/23	non-ferrous Meta Non-ferrous Meta bin bin copper bin copper bin bin copper bin bin bin bin bin bin bin bin	Apr28/22 Dec11/22	Jan24/23 Sep19/23	Nov123			
	2			Ž			
	0	Apr28/22	Jan 24/23	Nov1/23			
	Nov21/18 0	Deci 1/22	Jan 24/23	Nov1/23			
	0		Jan24/23		Base Number		
	61/21unf Viscosity @ 100°		Jan24/23	EZILAN			
	0 8//12/00 8//12/00 Viscosity @ 100%		52/P2/meL Sep19/23	10	.0 - Base	\wedge	
	Unov21/19 Viscosity @ 100° 19 18 Abnormal		Jan 24/23	10	.0 Base	\bigwedge	
	Unov21/19 Viscosity @ 100° 19 18 Abnormal		50P19/23	10	.0 Base	\bigwedge	
	0 80 00 00 00 00 00 00 00 00 00 00 00 00		52/62/des	10	.0 .0 .0	\bigwedge	
	Unov21/19 Viscosity @ 100° 19 18 Abnormal		E2/F2/mef	10 (0)HOX Bul) as full with a set	.0 - Base.	\bigwedge	
	0 61/27 00 000000000000000000000000000000000		E2/P2/meL	10	.0 - Base.		
	Viscosity @ 100° Building and a second and			10 (0, 4) (0, 4)	0 - Base.		
	Viscosity @ 100° Building and a second and			10 (0, 4) (0, 4)	0 - Base.	pi28/22 ec11/22	p19/23
Laboratory	Viscosity @ 100° ¹⁹ ⁴⁰ ¹⁹ ⁴⁰ ¹⁹ ⁴⁰	C Hotopical Dec1/120 501 Madis	EZ/61 das cz/b7uer son Ave., Ca	10 (0)(0)(0)(0)(0)(0)(0)(0)(0)(0)(0)(0)(0)(Passe. 0 0 0 0 0 0 0 0 0 0 0 0 0		Chillicothe Haulin
Laboratory Sample No. Lab Number Unique Number	Viscosity @ 100° Viscosity @ 100° Abnomal Abnomal Control of the second Control of the	Apr26/22	CZ/hZ/uer cZ/hZ/uer soon Ave., Ca d : 02 f ed : 03 f	10 (0)(0) 8 8 8 8 9 8 9 9 0 0 0 0 0 0 0 0 0 0 0 0	Passe. 0 0 0 0 0 0 0 0 0 0 0 0 0	onmental - 834 -	Chillicothe Haulin 1 Mitchell Road Chillicothe, MC
Sample No. Lab Number Unique Number Test Package	Viscosity @ 100% Viscosity @ 100% Annomal Annomal Control of the second Base Control of the second Control of	C 	EZ/61 deg son Ave., Ca d : 02 1 ed : 03 1 fician : Wes	10 (0)(0) (0)(0)(0)(0)(0)(0)(0)(0)(0)(0)(0)(0)(0)(Passe. 0 0 0 0 0 0 0 0 0 0 0 0 0	onmental - 834 - 20 Contact	Chillicothe Hauling 1 Mitchell Road Chillicothe, MC US 64601 t: Terry McKiddy
Sample No. Lab Number Unique Number	Viscosity @ 100% Viscosity @ 100% bhomma	C C C C C C C C C C C C C C	con Ave., Ca d : 02 f ed : 03 f ician : Wes	10 (0)(0) (0) (0) (0) (0) (0) (0) (0) (0) (Passe. 0 0 0 0 0 0 0 0 0 0 0 0 0	onmental - 834 - 20 Contact tmckic	Chillicothe Hauling 1 Mitchell Road Chillicothe, MC US 6460

Contact/Location: Terry McKiddy - GFL834