

## **OIL ANALYSIS REPORT**

Sample Rating Trend



Machine Ic **MACK 812100** 

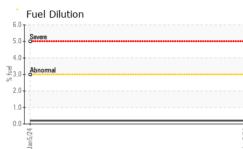
Component **Diesel Engine** Fluid

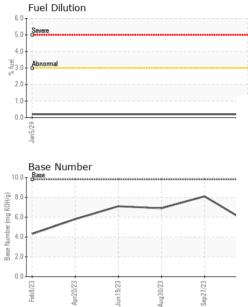
PETRO CANADA DURON SHP 15W40 (--- GAL)

DIAGNOSIS	SAMPLE INFOF	MATION	method	limit/base	current	history1	history2
Recommendation	Sample Number		Client Info		GFL0109060	GFL0086193	GFL0086260
o corrective action is recommended at this time.	Sample Date		Client Info		05 Jan 2024	27 Sep 2023	30 Aug 2023
sample at the next service interval to monitor.	Machine Age	hrs	Client Info		6168	5362	5362
ar	Oil Age	hrs	Client Info		6168	5477	5362
component wear rates are normal.	Oil Changed		Client Info		N/A	N/A	N/A
ntamination	Sample Status				ATTENTION	NORMAL	NORMAL
ts indicate that there is no fuel present in the oil. re is no indication of any contamination in the	CONTAMINAT	ION	method	limit/base	current	history1	history2
	Water		WC Method	>0.2	NEG	NEG	NEG
luid Condition	Glycol		WC Method		NEG	NEG	NEG
The oil viscosity is lower than normal. The BN result indicates that there is suitable alkalinity remaining in the oil. Confirm oil type.	WEAR METAL	S	method	limit/base	current	history1	history2
	Iron	ppm	ASTM D5185m	>120	19	2	12
	Chromium	ppm	ASTM D5185m	>20	1	0	<1
	Nickel	ppm	ASTM D5185m	>5	2	0	<1
	Titanium	ppm	ASTM D5185m	>2	<1	0	<1
	Silver	ppm	ASTM D5185m	>2	0	0	0
	Aluminum	ppm	ASTM D5185m	>20	2	0	<1
	Lead	ppm	ASTM D5185m	>40	<1	<1	<1
	Copper	ppm	ASTM D5185m	>330	3	<1	2
	Tin	ppm	ASTM D5185m	>15	1	<1	<1
	Vanadium	ppm	ASTM D5185m		0	<1	<1
	Cadmium	ppm	ASTM D5185m		<1	0	0
	ADDITIVES		method	limit/base	current	history1	history2
	Boron	ppm	ASTM D5185m	0	10	29	13
	Barium	ppm	ASTM D5185m	0	0	0	0
	Molybdenum	ppm	ASTM D5185m		76	62	68
	Manganese	ppm	ASTM D5185m		<1	<1	<1
	Magnesium	ppm	ASTM D5185m		912	788	902
	Calcium	ppm	ASTM D5185m		1445	1071	1156
	Phosphorus	ppm		1150	994	912	979
	Zinc	ppm	ASTM D5185m		1376	1132	1254
	Sulfur	ppm	ASTM D5185m	2060	3527	2961	3391
			method	limit/base		history1	history2
	CONTAMINAN	VIS					
				>25	7	2	5
	Silicon	ppm	ASTM D5185m	>25	7	2	5
	Silicon Sodium	ppm ppm	ASTM D5185m ASTM D5185m		0	1	2
	Silicon Sodium Potassium	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	>20	0 3	1 <1	2 3
	Silicon Sodium Potassium Fuel	ppm ppm	ASTM D5185m ASTM D5185m	>20 >3.0	0 3 0.2	1 <1 <1.0	2 3 <1.0
	Silicon Sodium Potassium Fuel INFRA-RED	ppm ppm ppm %	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D3524 method	>20 >3.0 limit/base	0 3 0.2 current	1 <1 <1.0 history1	2 3 <1.0 history2
	Silicon Sodium Potassium Fuel INFRA-RED Soot %	ppm ppm %	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D3524 method *ASTM D7844	>20 >3.0 limit/base >4	0 3 0.2 current 0.6	1 <1 <1.0 history1 0.1	2 3 <1.0 history2 0.5
	Silicon Sodium Potassium Fuel INFRA-RED Soot % Nitration	ppm ppm % % Abs/cm	ASTM D5185m ASTM D5185m ASTM D3524 ASTM D3524 <b>method</b> *ASTM D7844 *ASTM D7624	>20 >3.0 limit/base >4 >20	0 3 0.2 <u>current</u> 0.6 8.3	1 <1 <1.0 history1 0.1 4.6	2 3 <1.0 history2 0.5 7.4
	Silicon Sodium Potassium Fuel INFRA-RED Soot % Nitration Sulfation	ppm ppm % % Abs/cm Abs/.1mm	ASTM D5185m ASTM D5185m ASTM D3524 ASTM D3524 •ASTM D7844 *ASTM D7624 *ASTM D7415	>20 >3.0 limit/base >4 >20 >30	0 3 0.2 <u>current</u> 0.6 8.3 19.9	1 <1.0 history1 0.1 4.6 16.3	2 3 <1.0 history2 0.5 7.4 18.4
	Silicon Sodium Potassium Fuel INFRA-RED Soot % Nitration	ppm ppm % % Abs/cm Abs/.1mm	ASTM D5185m ASTM D5185m ASTM D3524 ASTM D3524 •ASTM D7844 *ASTM D7624 *ASTM D7415	>20 >3.0 limit/base >4 >20	0 3 0.2 <u>current</u> 0.6 8.3 19.9	1 <1 <1.0 history1 0.1 4.6	2 3 <1.0 history2 0.5 7.4
	Silicon Sodium Potassium Fuel INFRA-RED Soot % Nitration Sulfation	ppm ppm % % Abs/cm Abs/.1mm	ASTM D5185m ASTM D5185m ASTM D3524 ASTM D3524 •ASTM D7844 *ASTM D7624 *ASTM D7415	>20 >3.0 limit/base >4 >20 >30 limit/base	0 3 0.2 <u>current</u> 0.6 8.3 19.9	1 <1.0 history1 0.1 4.6 16.3	2 3 <1.0 history2 0.5 7.4 18.4



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	VISUAL		method	limit/base	current	history1	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
	Appearance	scalar	*Visual	NORML	NORML	NORML	NORML
	Ödor	scalar	*Visual	NORML	NORML	NORML	NORML
	Emulsified Water	scalar	*Visual	>0.2	NEG	NEG	NEG
	Free Water	scalar	*Visual		NEG	NEG	NEG
	FLUID PROPI	ERTIES	method	limit/base	current	history1	history2
	Visc @ 100°C	cSt	ASTM D445	15.4	<b>12.0</b>	12.7	12.3
	GRAPHS						
	Ferrous Alloys						
	45 40 iron	1	1				
	35 - management of the second						
	30						
	E <sup>25</sup> <sub>20</sub>	1 I 1 I 1 I					
				1			
$\sim$	15						
$\sim$	10		$\setminus$ /				
	Feb8/23 Apr20/23	Jun 19/23 . Aug 30/23 .	Sep 27/23	Jan 5/24			
	Feb Apr2	Jun1 Aug3	Sep2	Jan			
	Non-ferrous Meta	als					
Aug30/23 Sep27/23	16 copper	1					
Aug3	4 management lead						
	12 tin						
	<u>ة</u> ٥						
	2	A REAL PROPERTY AND IN COMMENTS	Hutbulleter water	Name and Address of the Owner o			
		9/23 -	7/23 -	Jan5/24 -			
	Feb 8/23 Apr20/23	Jun 19/23 Aug 30/23	Sep 27/23	Jan			
	Viscosity @ 100°				Base Number		
	Viscosity @ 100°			10.0	Base Number		
	Viscosity @ 100°				Base		
	Viscosity @ 100°				Base		
	Viscosity @ 100°				Base		
	Viscosity @ 100°				Base		
	Viscosity @ 100°			1.8 ase Number (mg KOH/g) 1.9	Base		
	Viscosity @ 100°			1.8 (Ma KOH/d) (Jack CoH/d)	Base		
	Viscosity @ 100°	C		1.8 1.0 1.9 1.9 1.9 1.9 1.9 1.9 1.9 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0	Base		
	Viscosity @ 100°	C	21/23	1.8 1.0 1.9 1.9 1.9 1.9 1.9 1.9 1.9 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0	Base	19/23	21/23
	Viscosity @ 100° Abnomal	C 4uga30/23 +	Sep21/23	1.8 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0	Hebb/23	Junt 9/23 Aug 30/23	Sep27/23
Laboratory Sample No	Viscosity @ 100° Abnomal Base Abnomal Base Coopulation Coopulation Base Coopulation Coo	C	son Ave., Ca	(0)HOX Bul) Jaquinki asses + 2.0 + 2.5 + 2.5 0.1 ry, NC 27513	Hebb/23	nvironmental -	009 - Fairbu
Laboratory Sample No Lab Numb	Viscosity @ 100° Abnomal Base Abnomal Base Control 15 Control 15 Contro	C E206Lum 501 Madis Recieved	son Ave., Ca I : 09 v	1.8 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0	Hebb/23	nvironmental -	<b>009 - Fairbu</b> Roosevelt Hv
Sample No	Viscosity @ 100°	C EZGLIUM 501 Madis Recieved Diagnose Diagnost	son Ave., Ca I : 09 c ed : 11 c ician : Sea	ry, NC 2751: Jan 2024 Jan 2024 un Felton	Hebb/23	nvironmental - 6905	<b>009 - Fairbu</b> Roosevelt Hy Fairburn, G US 302
Sample No Lab Numb Unique Num ficate 12367 Test Packa	Viscosity @ 100°	C 501 Madis Recieved Diagnose Diagnosti I Tests: Fu	son Ave., Ca I : 09 c ed : 11 c ician : Sea elDilution, Po	ry, NC 2751: Jan 2024 Jan 2024 Jan Felton ercentFuel )	Hebb/23	nvironmental - 6905 Cont	<b>009 - Fairbu</b> Roosevelt Hy Fairburn, C

Statements of conformity to specifications are based on the simple acceptance decision rule (JCGM 106:2012)

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