

OIL ANALYSIS REPORT

Sample Rating Trend





4581M Component Diesel Engine PETRO CANADA DURON SHP 15W40 (5 GAL)

DIAGNOSIS Recommendation

Resample at the next service interval to monitor. (Customer Sample Comment: Early sampled)

Machine Id

Wear

All component wear rates are normal.

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.

ON SHP 15W40 (5	GAL)	0ct2022	Sep2023	Nov2023 Mar2024	Mar2024	
SAMPLE INFORM	MATION	method	limit/base	current	history1	history2
Sample Number		Client Info		GFL0115167	GFL0115118	GFL0097732
Sample Date		Client Info		28 Mar 2024	14 Mar 2024	28 Nov 2023
Machine Age	hrs	Client Info		23880	23775	23175
Oil Age	hrs	Client Info		110	600	519
Oil Changed		Client Info		Not Changd	Changed	Changed
Sample Status				NORMAL	NORMAL	ATTENTION
CONTAMINATI	ON	method	limit/base	current	history1	history2
Fuel		WC Method	>3.0	<1.0	<1.0	<1.0
Water		WC Method	>0.2	NEG	NEG	NEG
Glycol		WC Method		NEG	NEG	NEG
WEAR METALS	S	method	limit/base	current	history1	history2
ron	ppm	ASTM D5185m	>90	39	53	50
Chromium	ppm	ASTM D5185m	>20	2	2	4
Nickel	ppm	ASTM D5185m		0	<1	1
Titanium	ppm	ASTM D5185m		0	<1	<1
Silver	ppm	ASTM D5185m		0	<1	0
Aluminum	ppm	ASTM D5185m	>20	3	4	3
Lead	ppm	ASTM D5185m	>40	0	<1	<1
Copper	ppm	ASTM D5185m		3	2	13
Tin	ppm	ASTM D5185m	>15	<1	<1	<1
Vanadium	ppm	ASTM D5185m		0	<1	<1
Cadmium	ppm	ASTM D5185m		0	0	0
ADDITIVES		method	limit/base	current	history1	history2
Boron	ppm	ASTM D5185m	0	4	11	2
Barium	ppm	ASTM D5185m	0	0	2	0
Molybdenum	ppm	ASTM D5185m	60	59	63	65
Manganese	ppm	ASTM D5185m	0	<1	<1	2
Magnesium	ppm	ASTM D5185m	1010	813	897	858
Calcium	ppm	ASTM D5185m	1070	1082	1164	1055
Phosphorus	ppm	ASTM D5185m	1150	050	1004	000
			1100	950	1004	896
Zinc	ppm	ASTM D5185m	1270	950 1164	1210	1196
	ppm ppm	ASTM D5185m	1270	1164 3239	1210	1196
Zinc Sulfur CONTAMINAN Silicon	ppm ppm	ASTM D5185m ASTM D5185m	1270 2060	1164 3239	1210 2880	1196 2494
Sulfur CONTAMINAN	ppm ppm TS	ASTM D5185m ASTM D5185m method	1270 2060 limit/base	1164 3239 current	1210 2880 history1	1196 2494 history2
Sulfur CONTAMINAN Silicon	ppm ppm TS ppm	ASTM D5185m ASTM D5185m method ASTM D5185m	1270 2060 limit/base >25	1164 3239 current 8	1210 2880 history1 7	1196 2494 history2 16
Sulfur CONTAMINAN Silicon Sodium	ppm ppm TS ppm ppm	ASTM D5185m ASTM D5185m method ASTM D5185m ASTM D5185m	1270 2060 limit/base >25	1164 3239 current 8 18 1	1210 2880 history1 7 6	1196 2494 history2 16 94
Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED	ppm ppm TS ppm ppm	ASTM D5185m ASTM D5185m Method ASTM D5185m ASTM D5185m ASTM D5185m	1270 2060 limit/base >25 >20	1164 3239 current 8 18 1	1210 2880 history1 7 6 4	1196 2494 history2 16 94 6
Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot %	ppm ppm TS ppm ppm ppm	ASTM D5185m ASTM D5185m Method ASTM D5185m ASTM D5185m ASTM D5185m method	1270 2060 limit/base >25 >20 limit/base >6	1164 3239 current 8 18 1 1 current	1210 2880 history1 7 6 4 4 history1	1196 2494 history2 16 94 6 kistory2
Sulfur CONTAMINAN Silicon Sodium Potassium	ppm ppm TS ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m method *ASTM D7844	1270 2060 limit/base >25 >20 limit/base >6	1164 3239 current 8 18 1 1 current 0.8	1210 2880 history1 7 6 4 history1 1	1196 2494 history2 16 94 6 history2 0.8
Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % Nitration	ppm ppm TS ppm ppm ppm ppm % Abs/cm Abs/.1mm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m *ASTM D7844 *ASTM D7624	1270 2060 limit/base >25 >20 limit/base >6 >20	1164 3239 current 8 18 1 1 current 0.8 11.5 20.2	1210 2880 history1 7 6 4 4 history1 1 1 12.9	1196 2494 history2 16 94 6 history2 0.8 11.2
Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation	ppm ppm TS ppm ppm ppm ppm % Abs/cm Abs/.1mm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m *ASTM D7844 *ASTM D7624	1270 2060 imit/base >25 >20 imit/base >6 >20 >30	1164 3239 current 8 18 1 1 current 0.8 11.5 20.2	1210 2880 history1 7 6 4 history1 1 12.9 24.9	1196 2494 history2 16 94 6 history2 0.8 11.2 21.3



16 Base

10

6. 0ct1/22

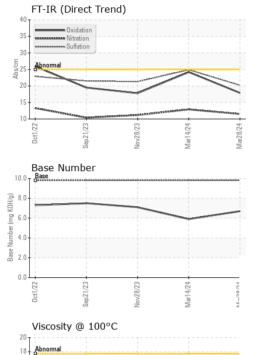
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OIL ANALYSIS REPORT



	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
Nov28/23 Marl 4/24 Mar28/24	Appearance	scalar	*Visual	NORML	NORML	NORML	NORML
Ma Ma	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	12.8	13.9	12.7
	GRAPHS						
	Ferrous Alloys						
23 24	iron						
Nov28/23 Marl 4/24	nickel						
	40						
	<u>특</u> 30						
	20						
	10						
	/	A R A R A R A R A R A R A R A R A R A R	******				
	0cc1/22 0 ep21/23	8/23		8/24			
	0ct1/22 Sep21/23	Nov28/23	Mar14/24	Mar28/24			
	Non-ferrous Meta	als					
Nov28/23 Mar14/24	14 copper						
Mai	12 - Lease lead						
	10	$\langle \rangle$					
	10	$\langle \rangle$					
	10						
	10						
			4724	1913 4			
		Nov28/23	Mar14/24	Mar26/24			
	Uiscosity @ 100°	Nav28/23 -	Mar14/24	Mai28/24	Base Number		
	Uiscosity @ 100%	Nav28/23 -	Mart 4,24		Base Number		
	Uiscosity @ 100°	Nav28/23 -	Mari 4/24	10.0	Base		
	Uiscosity @ 100%	Nav28/23 -	Mar14/24	10.0	Base		
	10 10 10 10 10 10 10 10 10 10	Nav28/23 -	Mart 4/24	10.0	Base		
	10 10 10 10 10 10 10 10 10 10	Nav28/23 -	Mart 4/24	10.0	Base		
	10 10 10 10 10 10 10 10 10 10	Nav28/23 -	Mart 4/24	10.0	Base		
	10 10 10 10 10 10 10 10 10 10	Nav28/23 -	Mar14/24	10.0 1.8 0.0 KOH(8)	Base		
	10 10 10 10 10 10 10 10 10 10	Nav28/23 -	Mari 4/24	10.0 (6, 8.0 (6, HOX 6, 0, 0) (6, 0, 0) (0,	Base		
	10 10 10 10 10 10 10 10 10 10	C Nov28/23-		10.0 (0)HOX Bull 30 Bull 30 Bu	Base		4/24
	10 10 10 10 10 10 10 10 10 10	Nav28/23 -	Mari 4/24 Mari 4/24	10.0 (6, 8.0 (6, HOX 6, 0, 0) (6, 0, 0) (0,	Base	Nov28/23	Mari 4,24
	Uiscosity @ 100°	Nov28/23 - Nov28/23 -	Mari 14/24	10.0 8.6 0.6 (0) 9.6 (0) 9.6 (0) 9.2 8 9.2 9 9.2 9 10 9 10 9 10 9 10 10 10 10 10 10 10 10 10 10 10 10 10	Sep21/22	Nov28/23	
Laboratory Sample No.	Viscosity @ 100° Viscosity @ 100°	C C 01 Madiso	http://www.cary	10.0 (b)(D) 40(0) (b)(D) 40(0) (b)(D) 40(0) (c)(D)(D)(D)(D)(D)(D)(D)(D)(D)(D)(D)(D)(D)	Sep21/22	EZUgZvoy	05 - Arbor Hil
Sample No.	Viscosity @ 100° Viscosity @ 100°	Nov28/23 - Nov28/23 -	PTFLIEW on Ave., Cary ived : 02	10.0 8.6 0.6 (0) 9.6 (0) 9.6 (0) 9.2 8 9.2 9 9.2 9 10 9 10 9 10 9 10 10 10 10 10 10 10 10 10 10 10 10 10	Sep21/22	EZUBZANNY Vironmental - 4	
Sample No. Lab Numbe Unique Numbe	Viscosity @ 100° Viscosity @ 100° Abnomal 6 6 6 7 10 10 10 10 10 10 10 10 10 10	C C D1 Madiso Recei	brin Ave., Cary ived : 02 id : 03	10.0 (0)HOX Bull Jaquing Verse 2.0 +270022eW 2, NC 27513 2 Apr 2024	GFL En	EZORZANNI EXTRONMENTAL - 4 NC	05 - Arbor Hil 7811 Chubb F DRTHVILLE, N US 4816
Sample No. Lab Numbe Unique Numbe	Viscosity @ 100° Viscosity @ 100° Viscosity @ 100°	C C 01 Madiso Recei Teste Diagr	on Ave., Cary ived : 02 nosed : 04	10.0 (0)HOX 10 (0)HOX 10 (GFL En	EZORZANNI EZORZANNI Ivironmental - 4 NC Contact: Al	05 - Arbor Hil 7811 Chubb F DRTHVILLE, M US 4816 nthony Hopkir
Sample No. Lab Numbe Unique Numbe	Viscosity @ 100° Viscosity @ 100° Abnomal Generation of the second of	C C 01 Madiso Recei Teste Diagr	on Ave., Cary ived : 02 nosed : 04 800-237-1365	10.0 (0)(100) 100 (100) 10	GFL En	vironmental - 4 NC Contact: A	05 - Arbor Hil 7811 Chubb F DRTHVILLE, N US 4816