

OIL ANALYSIS REPORT

Sample Rating Trend





Component Diesel Engine

Fluid PETRO CANADA DURON SHP 10W30 (--- GAL)

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

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.

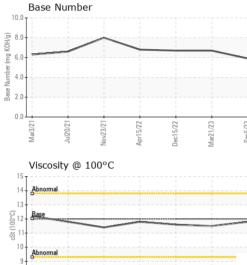
AL)		Mar2021	Jul2021 Nov2021	Apr2022 Dec2022 Mar2023	Sep2023	
SAMPLE INFORM	MATION	method	limit/base	current	history1	history2
Sample Number		Client Info		PCA0088665	PCA0088495	PCA0051834
Sample Date		Client Info		05 Sep 2023	21 Mar 2023	15 Dec 2022
Machine Age	mls	Client Info		299461	251114	213245
Oil Age	mls	Client Info		299461	37899	33116
Oil Changed		Client Info		Changed	Changed	Changed
Sample Status				NORMAL	NORMAL	NORMAL
CONTAMINATI	ON	method	limit/base	current	history1	history2
Fuel		WC Method	>5	<1.0	<1.0	<1.0
Glycol		WC Method		NEG	NEG	NEG
WEAR METALS	S	method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185m	>100	31	27	30
Chromium	ppm	ASTM D5185m	>20	2	1	1
Nickel	ppm	ASTM D5185m	>4	- <1	0	<1
Titanium	ppm	ASTM D5185m		0	0	0
Silver	ppm	ASTM D5185m	>3	0	0	0
Aluminum	ppm	ASTM D5185m		4	3	3
Lead	ppm	ASTM D5185m	>40	1	0	2
Copper	ppm	ASTM D5185m		5	1	4
Tin	ppm	ASTM D5185m		0	0	<1
Vanadium	ppm	ASTM D5185m	>15	0	0	0
Cadmium		ASTM D5185m		0	0	0
	ppm		1 <i>n</i>	-		-
ADDITIVES		method				history2
	ppm	ASTM D5185m		2	0	<1
Boron	ppm ppm	ASTM D5185m ASTM D5185m		2 0	0	<1 0
Boron Barium						
Boron Barium Molybdenum	ppm	ASTM D5185m	0 50	0	0	0
Boron Barium Molybdenum Manganese	ppm ppm	ASTM D5185m ASTM D5185m	0 50	0 55	0 65	0 62
Boron Barium Molybdenum Manganese Magnesium	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	0 50 0	0 55 <1	0 65 <1	0 62 <1
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 50 0 950	0 55 <1 850	0 65 <1 1007	0 62 <1 902
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus	ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 50 0 950 1050	0 55 <1 850 1162	0 65 <1 1007 1179	0 62 <1 902 1154
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc	ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 50 0 950 1050 995	0 55 <1 850 1162 948	0 65 <1 1007 1179 1004	0 62 <1 902 1154 918
Boron Barium Molybdenum Manganese Magnesium Calcium	ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 50 0 950 1050 995 1180	0 55 <1 850 1162 948 1126	0 65 <1 1007 1179 1004 1324	0 62 <1 902 1154 918 1185
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	0 50 0 950 1050 995 1180 2600	0 55 <1 850 1162 948 1126 2702	0 65 <1 1007 1179 1004 1324 3298	0 62 <1 902 1154 918 1185 3041
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 50 0 950 1050 995 1180 2600	0 55 <1 850 1162 948 1126 2702 current	0 65 <1 1007 1179 1004 1324 3298 history1	0 62 <1 902 1154 918 1185 3041 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 ASTM D5185m	0 50 0 950 1050 995 1180 2600	0 55 <1 850 1162 948 1126 2702 current 11	0 65 <1 1007 1179 1004 1324 3298 history1 8	0 62 <1 902 1154 918 1185 3041 history2 9
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium	ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 50 0 950 1050 995 1180 2600 Limit/base >25	0 55 <1 850 1162 948 1126 2702 current 11 9	0 65 <1 1007 1179 1004 1324 3298 history1 8 3	0 62 <1 902 1154 918 1185 3041 history2 9 3
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium	ppm	ASTM D5185m ASTM D5185m	0 50 0 950 1050 995 1180 2600 limit/base >25 >20	0 55 <1 850 1162 948 1126 2702 current 11 9 13	0 65 <1 1007 1179 1004 1324 3298 history1 8 3 1	0 62 <1 902 1154 918 1185 3041 history2 9 3 0
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 50 0 950 1050 995 1180 2600 limit/base >25 >20 limit/base >3	0 55 <1 850 1162 948 1126 2702 current 11 9 13 current	0 65 <1 1007 1179 1004 1324 3298 history1 8 3 1 history1	0 62 <1 902 1154 918 1185 3041 history2 9 3 0 history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot %	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	0 50 950 1050 995 1180 2600 <i>limit/base</i> >25 >20 <i>limit/base</i> >3 >20	0 55 <1 850 1162 948 1126 2702 current 11 9 13 current 1.4	0 65 <1 1007 1179 1004 1324 3298 history1 8 3 1 1 history1 1.3	0 62 <1 902 1154 918 1185 3041 history2 9 3 0 history2 1.9
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 ppm ppm	ASTM D5185m ASTM D5185m	0 50 950 1050 995 1180 2600 <i>limit/base</i> >25 >20 <i>limit/base</i> >3 >20	0 55 <1 850 1162 948 1126 2702 <u>current</u> 11 9 13 <u>current</u> 1.4 1.4 11.1	0 65 <1 1007 1179 1004 1324 3298 history1 8 3 1 8 3 1 1 history1 1.3 9.9	0 62 <1 902 1154 918 1185 3041 history2 9 3 0 history2 1.9 11.4
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 ppm ppm ppm	ASTM D5185m ASTM D5185m	0 50 950 1050 995 1180 2600 limit/base >25 20 limit/base >3 >20 >30	0 55 <1 850 1162 948 1126 2702 <u>current</u> 11 9 13 <u>current</u> 1.4 1.4 1.4	0 65 <1 1007 1179 1004 1324 3298 history1 8 3 1 8 3 1 1 history1 1.3 9.9 22.5	0 62 <1 902 1154 918 1185 3041 history2 9 3 0 history2 1.9 11.4 24.9



Mar3/21

OIL ANALYSIS REPORT

VISUAL



Vov23/21

Yellow Metal scalar *Visual NONE NONE Precipitate scalar *Visual NONE NONE Silt scalar *Visual NONE NONE Debris scalar *Visual NONE NONE Sand/Dirt scalar *Visual NONE NONE Appearance scalar *Visual NORML NORML Odor scalar *Visual NORML NORML	NONE NONE NONE NONE	NONE NONE NONE	
Silt scalar *Visual NONE NONE Debris scalar *Visual NONE NONE Sand/Dirt scalar *Visual NONE NONE Sand/Dirt scalar *Visual NONE NONE Appearance scalar *Visual NORML NORML Odor scalar *Visual NORML NORML	NONE NONE	NONE	
Debris scalar *Visual NONE NONE Sand/Dirt scalar *Visual NONE NONE Appearance scalar *Visual NORML NORML Odor scalar *Visual NORML NORML	NONE		
Sand/Dirt scalar *Visual NONE NONE ZZZ SIG BO CZZ SIG BO NORML NORML Odor scalar *Visual NORML NORML NORML			
NORML NORML Visual NORML Odor scalar *Visual NORML NORML	NONE		
	NORML	NONE	1
	NORML	NORMI	
Emulsified Water scalar *Visual >0.2 NEG	NEG	NEG	L
•C Free Water scalar Visual >0.2 NEG	NEG	NEG	
FLUID PROPERTIES method limit/base current	history1	histor	°v2 ∣
Visc @ 100°C cSt ASTM D445 12.00 11.8	11.5	11.6	5-
GRAPHS			
Ferrous Alloys			
30			
10			
Mar3/21 Jul20/21 Apr15/22 Dec15/22 Sep5/23			
Non-ferrous Metals			
70 - copper lead			
60 - tim			
長 40 30			
20			
10			
Mar3/21 Jul20/21 Apr15/22 Dec15/22 Sep5/23			
Viscosity @ 100°C Base Number			
14 Abnormal 8.0	~		
13 ₽ 7.0			
13 Base 0 <th></th> <th></th> <th></th>			
91			
	Apr15/22 -	Dec15/22 - Mar21/23 -	Sep5/23 -
Ma Julí Apr1 Mar2 Sep Mar2 . Jul2	Apr1	Mar2	Sep
Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513 Sample No. : PCA0088665 Received : 31 Oct 2023 Lab Number : 05994047 Diagnosed : 31 Oct 2023 Unique Number : 10722407 Diagnostician : Wes Davis Test Package : FLEET	IDWEST MOTOR EXPRESS 2169 MUSTANG DR MOUNDS VIEW, MN US 55112 Contact: FRANK DIETZ		
To discuss this sample report, contact Customer Service at 1-800-237-1369.	frank.dietz@mmeinc.com T: (763)225-6382 F: x:		