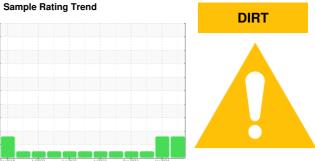


OIL ANALYSIS REPORT



Machine Id 929082-260353

Component

Diesel Engine

PETRO CANADA DURON SHP 15W40 (--- 0

DIAGNOSIS

Recommendation

No corrective action is recommended at this time. Resample at the next service interval to monitor.

Wear

All component wear rates are normal.

Contamination

Elemental level of silicon (Si) above normal.

Fluid Condition

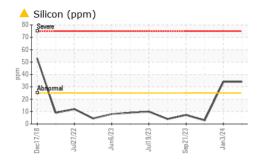
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is acceptable for the time in service.

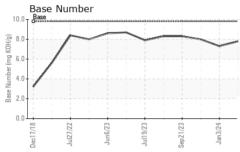
Sample Date Client Info 30 Jan 2024 16 Nov 2023 16 Nov 2023	iAL)		Dec2018	Jul2022 Jun2023	Jul2023 Sep2023 Ja	in2024	
Sample Date Client Info 30 Jan 2024 16 Nov 2023 16 Nov 2023	SAMPLE INFORM	MATION	method	limit/base	current	history1	history2
Machine Age hrs Client Info 136467 10987 10841 Dil Age hrs Client Info 0 2282 2282 Dil Changed Client Info Not Changed N/A Sample Status Norman ABNORMAL NORMAL CONTAMINATION method limit/base current history1 history2 Fuel WC Method >5 <1.0	Sample Number		Client Info		GFL0088135	GFL0104917	GFL0088104
Dil Age	Sample Date		Client Info		30 Jan 2024	03 Jan 2024	16 Nov 2023
Colient Info	Machine Age	hrs	Client Info		136467	10987	10841
ABNORMAL ABNORMAL ABNORMAL ABNORMAL ABNORMAL CONTAMINATION method limit/base current history1 history2	Oil Age	hrs	Client Info		0	2282	2282
CONTAMINATION	Oil Changed		Client Info		Not Changd	Changed	N/A
Water	Sample Status				ABNORMAL	ABNORMAL	NORMAL
Water Glycol WC Method WC Method >0.2 NEG NEG NEG NEG NEG NEG WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >10.0 15 9 26 Chromium ppm ASTM D5185m >20 <1	CONTAMINATI	ON	method	limit/base	current	history1	history2
WEAR METALS	Fuel		WC Method	>5	<1.0	<1.0	<1.0
WEAR METALS	Water		WC Method	>0.2	NEG	NEG	NEG
Description Description	Glycol		WC Method		NEG	NEG	NEG
Chromium	WEAR METALS	S	method	limit/base	current	history1	history2
Nickel	ron	ppm	ASTM D5185m	>100	15	9	26
Description	Chromium	ppm	ASTM D5185m	>20	<1	<1	1
Silver	Nickel	ppm		>4			
Aluminum ppm ASTM D5185m >20 <1 1 1 2 Lead ppm ASTM D5185m >40 0 1 4 Copper ppm ASTM D5185m >330 1 1 1 2 Tin ppm ASTM D5185m >15 0 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1		ppm			-		
Lead ppm ASTM D5185m >40 0 1 4 Copper ppm ASTM D5185m >330 1 1 2 Tin ppm ASTM D5185m >15 0 <1 <1 Vanadium ppm ASTM D5185m 0 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 0 <1 <1 Barium ppm ASTM D5185m 0 0 <1 <1 Barium ppm ASTM D5185m 0 0 0 <1 <1 Barium ppm ASTM D5185m 0 0 0 0 0 Manganese ppm ASTM D5185m 0 <1 <1 0 0 Magnesium ppm ASTM D5185m 1010 933 903 870 Calcium ppm ASTM D5185m <		• •					
Copper		ppm					
STIN ppm ASTM D5185m >15 0 0 0 0 0 0 0 0 0							
Vanadium ppm ASTM D5185m 0 0 0 Cadmium ppm ASTM D5185m 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 0 <1 <1 Barium ppm ASTM D5185m 0 0 0 0 Molybdenum ppm ASTM D5185m 0 60 60 56 55 Manganese ppm ASTM D5185m 0 <1 <1 0 Magnesium ppm ASTM D5185m 1010 933 903 870 Calcium ppm ASTM D5185m 1070 1078 991 1010 Phosphorus ppm ASTM D5185m 1270 1296 1184 1167 Sulfur ppm ASTM D5185m 2060 2976 2935 3370 CONTAMINANTS method limit/base current	• •						
Cadmium ppm ASTM D5185m 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 0 <1		• •		>15			
ADDITIVES							
Barium		ppm					
Barium ppm ASTM D5185m 0 0 0 0 Molybdenum ppm ASTM D5185m 60 60 56 55 Manganese ppm ASTM D5185m 0 <1	ADDITIVES						
Molybdenum ppm ASTM D5185m 60 60 56 55 Manganese ppm ASTM D5185m 0 <1 <1 0 Magnesium ppm ASTM D5185m 1010 933 903 870 Calcium ppm ASTM D5185m 1070 1078 991 1010 Phosphorus ppm ASTM D5185m 1150 1014 1050 990 Zinc ppm ASTM D5185m 1270 1296 1184 1167 Sulfur ppm ASTM D5185m 2060 2976 2935 3370 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 34 34 3 Sodium ppm ASTM D5185m >20 0 0 2 INFRA-RED method limit/base current history1 history2 Soot % *ASTM D7844 >3							
Manganese ppm ASTM D5185m 0 <1 <1 0 Magnesium ppm ASTM D5185m 1010 933 903 870 Calcium ppm ASTM D5185m 1070 1078 991 1010 Phosphorus ppm ASTM D5185m 1150 1014 1050 990 Zinc ppm ASTM D5185m 1270 1296 1184 1167 Sulfur ppm ASTM D5185m 2060 2976 2935 3370 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 34 34 3 Sodium ppm ASTM D5185m >20 0 0 2 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7624 >20 7.9 9.3 6.2 Sulfation Abs/:mm *ASTM		ppm			-		
Magnesium ppm ASTM D5185m 1010 933 903 870 Calcium ppm ASTM D5185m 1070 1078 991 1010 Phosphorus ppm ASTM D5185m 1150 1014 1050 990 Zinc ppm ASTM D5185m 1270 1296 1184 1167 Sulfur ppm ASTM D5185m 2060 2976 2935 3370 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 ▲ 34 3 3 Sodium ppm ASTM D5185m >20 0 0 2 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.3 0.8 0.2 Nitration Abs/cm *ASTM D7624 >20 7.9 9.3 6.2 Sulfation Abs/.1mm *ASTM D	•						
Calcium ppm ASTM D5185m 1070 1078 991 1010 Phosphorus ppm ASTM D5185m 1150 1014 1050 990 Zinc ppm ASTM D5185m 1270 1296 1184 1167 Sulfur ppm ASTM D5185m 2060 2976 2935 3370 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 34 34 3 Sodium ppm ASTM D5185m 3 3 2 Potassium ppm ASTM D5185m >20 0 0 2 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.3 0.8 0.2 Nitration Abs/cm *ASTM D7624 >20 7.9 9.3 6.2 Sulfation Abs/.1mm *ASTM D7415	•						
Phosphorus ppm ASTM D5185m 1150 1014 1050 990 Zinc ppm ASTM D5185m 1270 1296 1184 1167 Sulfur ppm ASTM D5185m 2060 2976 2935 3370 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 ▲ 34 3 3 2 Sodium ppm ASTM D5185m >20 0 0 2 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.3 0.8 0.2 Nitration Abs/cm *ASTM D7624 >20 7.9 9.3 6.2 Sulfation Abs/.1mm *ASTM D7415 >30 19.2 20.9 17.9 FLUID DEGRADATION method limit/base current history1 history2 Oxidation	_						
Zinc ppm ASTM D5185m 1270 1296 1184 1167 Sulfur ppm ASTM D5185m 2060 2976 2935 3370 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 ▲ 34 3 3 Sodium ppm ASTM D5185m >20 0 0 2 Potassium ppm ASTM D5185m >20 0 0 2 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.3 0.8 0.2 Nitration Abs/cm *ASTM D7624 >20 7.9 9.3 6.2 Sulfation Abs/.1mm *ASTM D7415 >30 19.2 20.9 17.9 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm							
Sulfur ppm ASTM D5185m 2060 2976 2935 3370 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 ▲ 34 ¾ 34 ¾ Sodium ppm ASTM D5185m >20 0 0 2 Potassium ppm ASTM D5185m >20 0 0 2 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.3 0.8 0.2 Nitration Abs/cm *ASTM D7624 >20 7.9 9.3 6.2 Sulfation Abs/.1mm *ASTM D7415 >30 19.2 20.9 17.9 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 15.4 17.4 13.8	•				_		
CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 ▲ 34 ¾ 34 ¾ 3 Sodium ppm ASTM D5185m 3 3 2 Potassium ppm ASTM D5185m >20 0 0 2 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.3 0.8 0.2 Nitration Abs/cm *ASTM D7624 >20 7.9 9.3 6.2 Sulfation Abs/.1mm *ASTM D7415 >30 19.2 20.9 17.9 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 15.4 17.4 13.8	-						
Silicon ppm ASTM D5185m >25 ▲ 34 ▲ 34 3 Sodium ppm ASTM D5185m 3 3 2 Potassium ppm ASTM D5185m >20 0 0 2 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.3 0.8 0.2 Nitration Abs/cm *ASTM D7624 >20 7.9 9.3 6.2 Sulfation Abs/.1mm *ASTM D7415 >30 19.2 20.9 17.9 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 15.4 17.4 13.8							
Sodium ppm ASTM D5185m 3 2 Potassium ppm ASTM D5185m >20 0 0 2 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.3 0.8 0.2 Nitration Abs/cm *ASTM D7624 >20 7.9 9.3 6.2 Sulfation Abs/.1mm *ASTM D7415 >30 19.2 20.9 17.9 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 15.4 17.4 13.8							
Potassium ppm ASTM D5185m >20 0 0 2 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.3 0.8 0.2 Nitration Abs/cm *ASTM D7624 >20 7.9 9.3 6.2 Sulfation Abs/.1mm *ASTM D7415 >30 19.2 20.9 17.9 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 15.4 17.4 13.8		• • • • • • • • • • • • • • • • • • • •		>20			
Soot % % *ASTM D7844 >3 0.3 0.8 0.2 Nitration Abs/cm *ASTM D7624 >20 7.9 9.3 6.2 Sulfation Abs/.1mm *ASTM D7415 >30 19.2 20.9 17.9 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 15.4 17.4 13.8				>20			
Soot % % *ASTM D7844 >3 0.3 0.8 0.2 Nitration Abs/cm *ASTM D7624 >20 7.9 9.3 6.2 Sulfation Abs/.1mm *ASTM D7415 >30 19.2 20.9 17.9 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 15.4 17.4 13.8	INFRA-RED		method	limit/base	current	history1	history2
Nitration Abs/cm *ASTM D7624 >20 7.9 9.3 6.2 Sulfation Abs/.1mm *ASTM D7415 >30 19.2 20.9 17.9 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 15.4 17.4 13.8		%					
Sulfation Abs/.1mm *ASTM D7415 >30 19.2 20.9 17.9 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 15.4 17.4 13.8							
Oxidation							
	FLUID DEGRAD	ATION	method	limit/base	current	history1	history2
	Oxidation	Abs/.1mm	*ASTM D7414	>25	15.4	17.4	13.8
	Base Number (BN)		ASTM D2896		7.8		

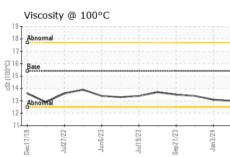
Submitted By: VINCE ASTI



OIL ANALYSIS REPORT



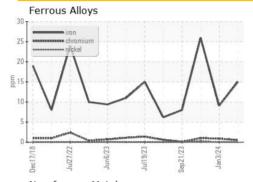


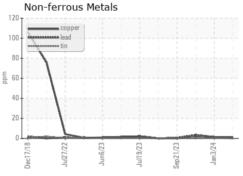


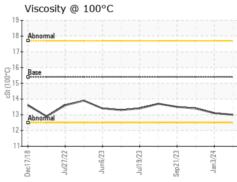
VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual	NONE	NONE	NONE	NONE
Appearance	scalar	*Visual	NORML	NORML	NORML	NORML
Odor	scalar	*Visual	NORML	NORML	NORML	NORML
Emulsified Water	scalar	*Visual	>0.2	NEG	NEG	NEG
Free Water	scalar	*Visual		NEG	NEG	NEG

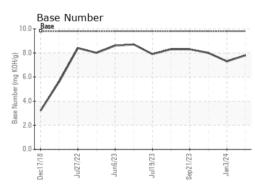
FLUID PROPI	ERIIES	method	limit/base	current	history1	history2
Visc @ 100°C	cSt	ASTM D445	15.4	13.0	13.1	13.4

GRAPHS













Certificate L2367

Laboratory Sample No. Lab Number : 06085629

: GFL0088135

Unique Number : 10873074 Test Package : FLEET

To discuss this sample report, contact Customer Service at 1-800-237-1369.

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 Received : 12 Feb 2024 **Tested** : 12 Feb 2024

Diagnosed : 13 Feb 2024 - Don Baldridge

GFL Environmental - 820 - Joplin Hauling

3700 West 7th Street Joplin, MO US 64801

Contact: James Jarrett

jjarrett@gflenv.com T: (417)310-2802

* - Denotes test methods that are outside of the ISO 17025 scope of accreditation. Statements of conformity to specifications are based on the simple acceptance decision rule (JCGM 106:2012)