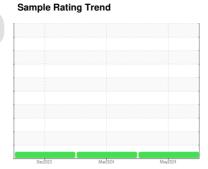


# **OIL ANALYSIS REPORT**



(36765HA) 723005 1 Diesel Engine

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





## DIAGNOSIS

### Recommendation

Resample at the next service interval to monitor.

All component wear rates are normal.

### Contamination

There is no indication of any contamination in the

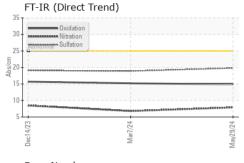
## **Fluid Condition**

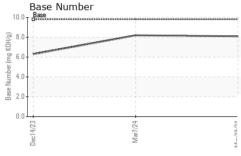
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

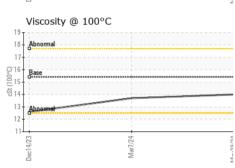
Sample Number Sample Date Machine Age hrs Oil Age hrs Oil Changed Sample Status  CONTAMINATION Fuel Water Glycol  WEAR METALS Iron ppm Chromium ppm Nickel ppm Titanium ppm Silver ppm Aluminum ppm Lead ppm Copper ppm Tin ppm Vanadium ppm Cadmium ppm Barium ppm Barium ppm Molybdenum ppm Manganese ppm Magnesium ppm Calcium ppm Sulfur ppm Calcium ppm Calcium ppm Calcium ppm Calcium ppm Sulfur ppm Sulfur ppm Contamination ppm Calcium ppm Contamination ppm Calcium ppm Sulfur ppm Sulfur ppm Sulfur ppm Sodium ppm Sodium ppm Potassium ppm INFRA-RED Soot % % Nitration Abs/cn	Client Info Client Info Client Info Client Info Client Info Client Info WC Method WC Method	limit/base	GFL0113618 29 May 2024 16299 388 Not Changd NORMAL	GFL0113601 07 Mar 2024 16171 260	GFL0103821 14 Dec 2023 15911	
Machine Age hrs Oil Age hrs Oil Changed Sample Status  CONTAMINATION Fuel Water Glycol  WEAR METALS Iron ppm Chromium ppm Nickel ppm Titanium ppm Silver ppm Aluminum ppm Lead ppm Copper ppm Tin ppm Vanadium ppm Cadmium ppm Barium ppm Molybdenum ppm Manganese ppm Magnesium ppm Calcium ppm Sulfur ppm CONTAMINANTS Silicon ppm Sodium ppm CONTAMINANTS Silicon ppm Sodium ppm Potassium ppm INFRA-RED Soot % %	Client Info Client Info Client Info Method WC Method	limit/base	16299 388 Not Changd	16171 260		
Oil Age   hrs   Oil Changed   Sample Status   CONTAMINATION   Fuel   Water   Glycol   WEAR METALS   Iron   ppm   Chromium   ppm   Thera-Red   Chromium   ppm   Thera-Red   Chromium   ppm   ppm   Chromium   ppm   ppm   Chromium   ppm	Client Info Client Info method WC Method	limit/base	388 Not Changd	260	15911	
Oil Age   hrs   Oil Changed   Sample Status   CONTAMINATION   Fuel   Water   Glycol   WEAR METALS   Iron   ppm   Chromium   ppm   Thera-Red   Chromium   ppm   Thera-Red   Chromium   ppm   ppm   Chromium   ppm   ppm   Chromium   ppm	Client Info  method  WC Method	limit/base	Not Changd			
Oil Changed Sample Status  CONTAMINATION  Fuel Water Glycol  WEAR METALS  Iron ppm Chromium ppm Nickel ppm Titanium ppm Silver ppm Aluminum ppm Lead ppm Copper ppm Tin ppm Vanadium ppm Cadmium ppm Barium ppm Barium ppm Molybdenum ppm Manganese ppm Magnesium ppm Calcium ppm Contalcium ppm Calcium ppm Contalcium ppm Calcium ppm Contalcium ppm Calcium ppm Contalcium	method WC Method	limit/base		N I / A	289	
CONTAMINATION Fuel Water Glycol  WEAR METALS Iron ppm Chromium ppm Nickel ppm Titanium ppm Aluminum ppm Lead ppm Copper ppm Tin ppm Vanadium ppm Cadmium ppm Barium ppm Barium ppm Molybdenum ppm Manganese ppm Magnesium ppm Calcium ppm Calcium ppm CoNTAMINANTS Silicon ppm Sodium ppm Sodium ppm CONTAMINANTS Silicon ppm Sodium ppm INFRA-RED Soot % %	WC Method	limit/base		N/A	Changed	
Fuel Water Glycol  WEAR METALS  Iron ppm Chromium ppm Nickel ppm Titanium ppm Aluminum ppm Lead ppm Copper ppm Tin ppm Vanadium ppm Cadmium ppm Barium ppm Barium ppm Molybdenum ppm Manganese ppm Magnesium ppm Calcium ppm Calcium ppm Contakina ppm Calcium ppm Calcium ppm Contakina ppm Calcium ppm Calcium ppm Calcium ppm Calcium ppm Calcium ppm Calcium ppm Contakina	WC Method	limit/base		NORMAL	NORMAL	
Water Glycol  WEAR METALS  Iron ppm Chromium ppm Nickel ppm Titanium ppm Silver ppm Aluminum ppm Lead ppm Copper ppm Tin ppm Vanadium ppm Vanadium ppm Barium ppm Barium ppm Molybdenum ppm Manganese ppm Magnesium ppm Calcium ppm Zinc ppm Sulfur ppm Sulfur ppm CONTAMINANTS Silicon ppm Sodium ppm Sodium ppm Sodium ppm Potassium ppm INFRA-RED Soot % %			current	history1	history2	
Glycol  WEAR METALS  Iron ppm Chromium ppm Nickel ppm Titanium ppm Silver ppm Aluminum ppm Lead ppm Copper ppm Tin ppm Vanadium ppm Cadmium ppm Barium ppm Molybdenum ppm Manganese ppm Magnesium ppm Calcium ppm Calcium ppm Phosphorus ppm Sulfur ppm Sulfur ppm CONTAMINANTS Silicon ppm Sodium ppm Potassium ppm INFRA-RED Soot % %	WC Method	>3.0	<1.0	<1.0	<1.0	
WEAR METALS  Iron ppm Chromium ppm Nickel ppm Titanium ppm Silver ppm Aluminum ppm Lead ppm Copper ppm Tin ppm Vanadium ppm Cadmium ppm ADDITIVES  Boron ppm Barium ppm Molybdenum ppm Manganese ppm Magnesium ppm Calcium ppm Calcium ppm Contakina ppm Contakina ppm Contakina ppm Contakina ppm Marganese ppm Marganese ppm Colorium ppm Colorium ppm Contakina ppm INFRA-RED Soot %		>0.2	NEG	NEG	NEG	
Iron ppm Chromium ppm Nickel ppm Titanium ppm Silver ppm Aluminum ppm Lead ppm Copper ppm Tin ppm Vanadium ppm Cadmium ppm Barium ppm Barium ppm Molybdenum ppm Manganese ppm Magnesium ppm Calcium ppm Phosphorus ppm Sulfur ppm Sulfur ppm Sodium ppm CONTAMINANTS Silicon ppm Sodium ppm Norm Sodium ppm	WC Method		NEG	NEG	NEG	
Chromium ppm Nickel ppm Titanium ppm Silver ppm Aluminum ppm Lead ppm Copper ppm Tin ppm Vanadium ppm Cadmium ppm ADDITIVES Boron ppm Barium ppm Manganese ppm Magnesium ppm Calcium ppm Calcium ppm Calcium ppm Contakina ppm Contakina ppm Contakina ppm Tin ppm Marganese ppm Manganese ppm Magnesium ppm Coloium ppm Contakina ppm Contakina ppm Sulfur ppm Contakinant pp	method	limit/base	current	history1	history2	
Nickel ppm Titanium ppm Silver ppm Aluminum ppm Lead ppm Copper ppm Tin ppm Vanadium ppm Cadmium ppm ADDITIVES Boron ppm Barium ppm Molybdenum ppm Manganese ppm Magnesium ppm Calcium ppm Calcium ppm Containe ppm Containe ppm Containe ppm Tin ppm Magnesium ppm Magnesium ppm Calcium ppm Calcium ppm Calcium ppm Calcium ppm Containe ppm Sodium ppm Tontaine ppm Sodium ppm Sodium ppm Sodium ppm Sodium ppm INFRA-RED Soot %	ASTM D5185m	>120	15	11	22	
Nickel ppm Titanium ppm Silver ppm Aluminum ppm Lead ppm Copper ppm Tin ppm Vanadium ppm Cadmium ppm ADDITIVES Boron ppm Barium ppm Molybdenum ppm Manganese ppm Magnesium ppm Calcium ppm Calcium ppm Containe ppm Containe ppm Containe ppm Tin ppm Magnesium ppm Magnesium ppm Calcium ppm Calcium ppm Calcium ppm Calcium ppm Containe ppm Sodium ppm Tontaine ppm Sodium ppm Sodium ppm Sodium ppm Sodium ppm INFRA-RED Soot %	ASTM D5185m	>20	<1	<1	1	
Titanium ppm Silver ppm Aluminum ppm Lead ppm Copper ppm Tin ppm Vanadium ppm Cadmium ppm ADDITIVES Boron ppm Barium ppm Molybdenum ppm Manganese ppm Magnesium ppm Calcium ppm Phosphorus ppm Zinc ppm Sulfur ppm CONTAMINANTS Silicon ppm Sodium ppm Potassium ppm INFRA-RED Soot % %	ASTM D5185m	>5	3	3	4	
Silver ppm Aluminum ppm Lead ppm Copper ppm Tin ppm Vanadium ppm Cadmium ppm ADDITIVES Boron ppm Barium ppm Molybdenum ppm Manganese ppm Magnesium ppm Calcium ppm Contaminants Silicon ppm Sodium ppm Sodium ppm INFRA-RED Soot % %	ASTM D5185m	>2	0	0	<1	
Aluminum ppm Lead ppm Copper ppm Tin ppm Vanadium ppm Cadmium ppm ADDITIVES Boron ppm Barium ppm Molybdenum ppm Manganese ppm Magnesium ppm Calcium ppm Calcium ppm Calcium ppm Contamination ppm Sinc ppm Sulfur ppm CONTAMINANTS Silicon ppm Sodium ppm Potassium ppm INFRA-RED Soot % %	ASTM D5185m	>2	0	0	0	
Lead ppm Copper ppm Tin ppm Vanadium ppm Cadmium ppm ADDITIVES Boron ppm Barium ppm Molybdenum ppm Manganese ppm Magnesium ppm Calcium ppm Phosphorus ppm Sulfur ppm Sulfur ppm Sodium ppm Sodium ppm Potassium ppm Sodium ppm	ASTM D5185m	>20	<1	<1	16	
Copper ppm Tin ppm Vanadium ppm Cadmium ppm ADDITIVES Boron ppm Barium ppm Molybdenum ppm Manganese ppm Magnesium ppm Calcium ppm Phosphorus ppm Sulfur ppm CONTAMINANTS Silicon ppm Sodium ppm Potassium ppm INFRA-RED Soot % %	ASTM D5185m	>40	0	0	<1	
Tin ppm Vanadium ppm Cadmium ppm ADDITIVES Boron ppm Barium ppm Molybdenum ppm Manganese ppm Calcium ppm Phosphorus ppm Zinc ppm Sulfur ppm CONTAMINANTS Silicon ppm Sodium ppm Potassium ppm INFRA-RED Soot % %	ASTM D5185m	>330	1	15	3	
Vanadium ppm Cadmium ppm ADDITIVES Boron ppm Barium ppm Molybdenum ppm Manganese ppm Magnesium ppm Calcium ppm Phosphorus ppm Zinc ppm Sulfur ppm CONTAMINANTS Silicon ppm Sodium ppm Potassium ppm INFRA-RED Soot % %	ASTM D5185m	>15	- <1	0	1	
Cadmium ppm  ADDITIVES  Boron ppm Barium ppm Molybdenum ppm Manganese ppm Magnesium ppm Calcium ppm Phosphorus ppm Zinc ppm Sulfur ppm CONTAMINANTS Silicon ppm Sodium ppm Potassium ppm INFRA-RED Soot % %	ASTM D5185m	>10	0	0	0	
ADDITIVES  Boron ppm Barium ppm Molybdenum ppm Manganese ppm Magnesium ppm Calcium ppm Phosphorus ppm Zinc ppm Sulfur ppm CONTAMINANTS Silicon ppm Sodium ppm Potassium ppm INFRA-RED Soot % %	ASTM D5185m		0	0	0	
Boron ppm Barium ppm Molybdenum ppm Manganese ppm Magnesium ppm Calcium ppm Phosphorus ppm Zinc ppm Sulfur ppm CONTAMINANTS Silicon ppm Sodium ppm Potassium ppm INFRA-RED Soot % %		1				
Barium ppm Molybdenum ppm Manganese ppm Magnesium ppm Calcium ppm Phosphorus ppm Zinc ppm Sulfur ppm CONTAMINANTS Silicon ppm Sodium ppm Potassium ppm INFRA-RED Soot % %	method	limit/base	current	history1	history2	
Molybdenum ppm Manganese ppm Magnesium ppm Calcium ppm Phosphorus ppm Zinc ppm Sulfur ppm CONTAMINANTS Silicon ppm Sodium ppm Potassium ppm INFRA-RED Soot % %	ASTM D5185m	0	1	12	5	
Manganese ppm Magnesium ppm Calcium ppm Phosphorus ppm Zinc ppm Sulfur ppm CONTAMINANTS Silicon ppm Sodium ppm Potassium ppm INFRA-RED Soot % %	ASTM D5185m	0	0	0	<1	
Magnesium ppm Calcium ppm Phosphorus ppm Zinc ppm Sulfur ppm CONTAMINANTS Silicon ppm Sodium ppm Potassium ppm INFRA-RED Soot % %	ASTM D5185m	60	58	58	60	
Calcium ppm Phosphorus ppm Zinc ppm Sulfur ppm  CONTAMINANTS Silicon ppm Sodium ppm Potassium ppm INFRA-RED Soot % %	ASTM D5185m	0	<1	<1	1	
Phosphorus ppm Zinc ppm Sulfur ppm  CONTAMINANTS Silicon ppm Sodium ppm Potassium ppm INFRA-RED Soot % %	ASTM D5185m	1010	961	905	918	
Zinc ppm Sulfur ppm  CONTAMINANTS Silicon ppm Sodium ppm Potassium ppm INFRA-RED Soot % %	ASTM D5185m	1070	1048	1072	1039	
Sulfur ppm  CONTAMINANTS  Silicon ppm Sodium ppm Potassium ppm INFRA-RED  Soot % %	ASTM D5185m	1150	1016	915	1076	
CONTAMINANTS  Silicon ppm Sodium ppm Potassium ppm INFRA-RED  Soot % %	ASTM D5185m	1270	1229	1104	1243	
Silicon ppm Sodium ppm Potassium ppm INFRA-RED Soot % %	ASTM D5185m	2060	3013	3208	2963	
Sodium ppm Potassium ppm INFRA-RED Soot % %	method	limit/base	current	history1	history2	
Potassium ppm INFRA-RED Soot % %		>25	4	9	5	
INFRA-RED Soot % %	ASTM D5185m		2	2	6	
Soot % %	ASTM D5185m ASTM D5185m	>20	0	<1	2	
				history1	history2	
Nitration Abs/cn	ASTM D5185m	limit/base	current	0.0	0.3	
	ASTM D5185m ASTM D5185m	limit/base	current 0.9	0.2	8.5	
Sulfation Abs/.1mr	ASTM D5185m ASTM D5185m method *ASTM D7844			6.8		
FLUID DEGRADATION method limit/base current history1 history2						
Oxidation Abs/.1mr	ASTM D5185m ASTM D5185m method *ASTM D7844 n *ASTM D7624 n *ASTM D7615	>4 >20 >30	0.9 7.9 19.8	6.8 18.9	19.1 history2	
Base Number (BN) mg KOH/	ASTM D5185m ASTM D5185m method *ASTM D7844 n *ASTM D7624 n *ASTM D7415 N method	>4 >20 >30	0.9 7.9 19.8	6.8 18.9		



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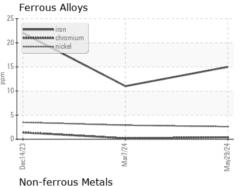


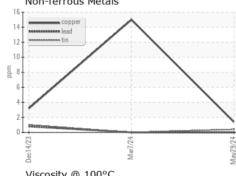


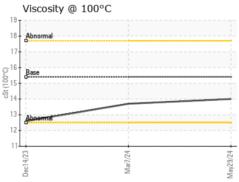
VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual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

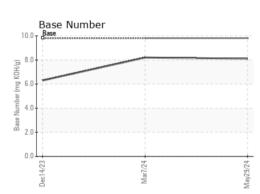
FLUID PROPI	ERHES	method				history2
Visc @ 100°C	cSt	ASTM D445	15.4	14.0	13.7	12.6

## **GRAPHS**













Certificate 12367

Laboratory Sample No.

Lab Number : 06198511

Test Package : FLEET

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 : GFL0113618 Unique Number : 11060634

Received **Tested** Diagnosed

: 03 Jun 2024 : 04 Jun 2024

: 04 Jun 2024 - Wes Davis

GFL Environmental - 654S - Midlothian

12230 Deergrove Road Midlothian, VA

US 23112 Contact: Corbin Umphlet

cumphlet@gflenv.com T:

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

F: