

## **OIL ANALYSIS REPORT**

Sample Rating Trend



# 3589C AUTOCAR ACX

**Natural Gas Engine** 

PETRO CANADA DURON GEO LD 15W40 (--- GAL)

### DIAGNOSIS

#### Recommendation

Resample at the next service interval to monitor.

#### Wear

All component wear rates are normal.

#### Contamination

There is no indication of any contamination in the oil.

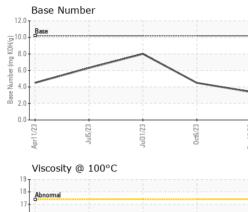
## Fluid Condition

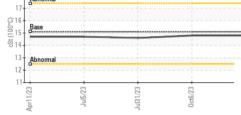
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

SAMPLE INFORI	MATION	method	limit/base	current	history1	history2
Sample Number		Client Info		GFL0094647	GFL0094698	GFL0089262
Sample Date		Client Info		12 Dec 2023	06 Oct 2023	31 Jul 2023
Machine Age	hrs	Client Info		24450	23895	2204
Oil Age	hrs	Client Info		555	1254	0
Oil Changed		Client Info		Changed	Changed	Not Changd
Sample Status				NORMAL	NORMAL	NORMAL
CONTAMINAT	ION	method	limit/base	current	history1	history2
Water		WC Method	>0.1	NEG	NEG	NEG
WEAR METAL	S	method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185m	>50	20	14	8
Chromium	ppm	ASTM D5185m	>4	1	<1	<1
Nickel	ppm	ASTM D5185m	>2	<1	0	0
Titanium	ppm	ASTM D5185m		0	0	0
Silver	ppm	ASTM D5185m	>3	0	0	0
Aluminum	ppm	ASTM D5185m	>9	3	7	1
Lead	ppm	ASTM D5185m	>30	16	6	<1
Copper	ppm	ASTM D5185m	>35	<1	<1	<1
Tin	ppm	ASTM D5185m	>4	<1	0	0
Vanadium	ppm	ASTM D5185m		0	0	<1
Cadmium	ppm	ASTM D5185m		0	0	0
ADDITIVES		method	limit/base	current	history1	history2
ADDITIVES		method	initit buse	ounon	matory	
Boron	ppm	ASTM D5185m	50	10	10	27
	ppm ppm					
Boron		ASTM D5185m	50	10	10	27
Boron Barium	ppm	ASTM D5185m ASTM D5185m	50 5	10 0	10 0	27 0
Boron Barium Molybdenum	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	50 5 50	10 0 57	10 0 55	27 0 49
Boron Barium Molybdenum Manganese	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	50 5 50 0	10 0 57 <1	10 0 55 <1	27 0 49 <1
Boron Barium Molybdenum Manganese Magnesium	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	50 5 50 0 560	10 0 57 <1 600	10 0 55 <1 598	27 0 49 <1 574
Boron Barium Molybdenum Manganese Magnesium Calcium	ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	50 5 50 0 560 1510	10 0 57 <1 600 1687	10 0 55 <1 598 1673	27 0 49 <1 574 1594
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus	ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	50 5 50 0 560 1510 780	10 0 57 <1 600 1687 779	10 0 55 <1 598 1673 738	27 0 49 <1 574 1594 748
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc	ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	50 5 50 0 560 1510 780 870	10 0 57 <1 600 1687 779 1001	10 0 55 <1 598 1673 738 1035	27 0 49 <1 574 1594 748 941
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 ASTM D5185m	50 5 50 560 1510 780 870 2040	10 0 57 <1 600 1687 779 1001 2873	10 0 55 <1 598 1673 738 1035 2571	27 0 49 <1 574 1594 748 941 2841
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	50 5 50 560 1510 780 870 2040	10 0 57 <1 600 1687 779 1001 2873 current	10 0 55 <1 598 1673 738 1035 2571 history1	27 0 49 <1 574 1594 748 941 2841 history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon	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 ASTM D5185m	50 5 50 0 560 1510 780 870 2040 <b>limit/base</b> >+100	10 0 57 <1 600 1687 779 1001 2873 current 13	10 0 55 <1 598 1673 738 1035 2571 history1 14	27 0 49 <1 574 1594 748 941 2841 2841 history2 12
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 ASTM D5185m	50 5 50 0 560 1510 780 870 2040 <b>limit/base</b> >+100	10 0 57 <1 600 1687 779 1001 2873 <u>current</u> 13 7	10 0 55 <1 598 1673 738 1035 2571 <b>history1</b> 14 9	27 0 49 <1 574 1594 748 941 2841 2841 history2 12 5
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium	ppm ppm ppm ppm ppm ppm ppm ppm TS	ASTM D5185m ASTM D5185m	50 50 00 560 1510 780 870 2040 <b>limit/base</b> >+100	10 0 57 <1 600 1687 779 1001 2873 current 13 7 4	10 0 55 <1 598 1673 738 1035 2571 history1 14 9 2	27 0 49 <1 574 1594 748 941 2841 <b>history2</b> 12 5 2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED	ppm ppm ppm ppm ppm ppm ppm ppm TS ppm ppm	ASTM D5185m ASTM D5185m	50 50 0 560 1510 780 870 2040 2040 >+100 >20 20 imit/base	10 0 57 <1 600 1687 779 1001 2873 current 13 7 4 x	10 0 55 <1 598 1673 738 1035 2571 history1 14 9 2 2 history1	27 0 49 <1 574 1594 748 941 2841 <b>history2</b> 12 5 2 2 <b>history2</b>
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot %	ppm ppm ppm ppm ppm ppm ppm ppm TS ppm ppm	ASTM D5185m ASTM D5185m	50 50 0 560 1510 780 870 2040 2040 >+100 >20 20 imit/base	10 0 57 <1 600 1687 779 1001 2873 <i>current</i> 13 7 4 <i>current</i>	10 0 55 <1 598 1673 738 1035 2571 history1 14 9 2 2 history1 0	27 0 49 <1 574 1594 748 941 2841 history2 12 5 2 2 history2 0
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	50 50 00 560 1510 780 870 2040 imit/base >+100 20 imit/base	10 0 57 <1 600 1687 779 1001 2873 <i>current</i> 13 7 4 <i>current</i> 0 11.9	10 0 55 <1 598 1673 738 1035 2571 history1 14 9 2 history1 0 10.5	27 0 49 <1 574 1594 748 941 2841 history2 12 5 2 12 5 2 history2 0 7.5
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	50 50 560 1510 780 870 2040 <b>Imit/base</b> >20 <b>Imit/base</b> >20 <b>Imit/base</b>	10 0 57 <1 600 1687 779 1001 2873 <b>current</b> 13 7 4 <b>current</b> 0 11.9 25.9	10 0 55 <1 598 1673 738 1035 2571 history1 14 9 2 2 history1 0 10.5 22.5	27 0 49 <1 574 1594 748 941 2841 history2 12 5 2 2 history2 0 7.5 19.2
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 D7844 *ASTM D7844	50 50 560 1510 780 870 2040 >+100 >+100 >20 imit/base >20 >30 imit/base	10 0 57 <1 600 1687 779 1001 2873 <i>current</i> 13 7 4 <i>current</i> 0 11.9 25.9	10 0 55 <1 598 1673 738 1035 2571 history1 14 9 2 history1 0 10.5 22.5 history1	27 0 49 <1 574 1594 748 941 2841 history2 12 5 2 12 5 2 history2 0 7.5 19.2 history2

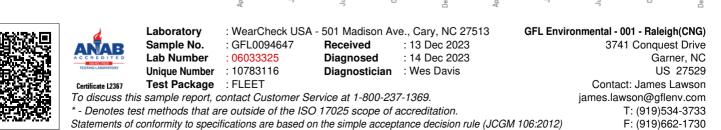


# **OIL ANALYSIS REPORT**





Yellow Metal scalar *Visual NONE NONE NONE NONE NONE Precipitate scalar *Visual NONE NONE NONE NONE NONE Stit scalar *Visual NONE NONE NONE NONE Sand/Dirt scalar *Visual NONE NONE NONE NONE Appearance scalar *Visual NORML NORML NORML NORML Cdor scalar *Visual NORML NORML NORML NORML NORML Emulsified Water scalar *Visual >0.1 NORML NORML NORML NORML Emulsified Water scalar *Visual >0.1 NEG NEG NEG NEG Free Water scalar *Visual >0.1 NORML NORML NORML State of the scalar *Visual >0.1 NORML NORML NORML NEG NEG NEG Free Water scalar *Visual >0.1 ANE NORML NORML NORML NORML NORML NORML NORML Free Water scalar *Visual >0.1 NEG NEG NEG Free Water scalar *Visual >0.1 NEG NEG NEG Free Water scalar *Visual >0.1 ANE NORML NORML NORML NORML NORML NORML NORML NORML NORML NORML NORML NEG NEG NEG Free Water scalar *Visual >0.1 NEG NEG NEG Free Water scalar *Visual >0.1 NEG NEG NEG Free Water scalar *Visual >0.1 ANE NEG NEG NEG NEG NEG Free Water scalar *Visual >0.1 NEG NEG NEG Free Water scalar *Visual *0.1 Hate 14.8 14.8 14.6 CHAPHS Ferrous Alloys	Yellow Metal scalar 'Visual NONE NONE NONE NONE NONE Precipitate scalar 'Visual NONE NONE NONE NONE Sadar' Visual NORML NORML NORML NORML NORML Emulsified Water scalar 'Visual >0.1 NEG NEG NEG Free Water scalar 'Visual >0.1 NEG NEG NEG Free Water scalar 'Visual NOH45 15.1 14.8 14.8 14.6 CHAPHS Ferrous Alloys Viscosity @ 100°C Uscosity @ 100°C Mammind and and and and and and and and and a	VISUAL		method	limit/base	current	history1	history2
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Silt scalar Visual NONE NONE NONE NONE NONE NONE NONE Scalar Visual NONE NONE NONE NONE NONE Scalar Visual NONE NONE NONE NONE NONE NONE Scalar Visual NORML	Silt scalar Visual NONE NONE NONE NONE NONE NONE NONE Scalar Visual NONE NONE NONE NONE NONE Scalar Visual NONE NONE NONE NONE NONE Scalar Visual NORML NORM	Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Debris scalar Visual NONE NONE NONE NONE NONE NONE Appearance scalar Visual NORML NORML NORML NORML NORML NORML NORML Emulsified Water scalar Visual NORML NORML NORML NORML NORML NORML Emulsified Water scalar Visual >0.1 NEG NEG NEG NEG TEUID PROPERTIES method limit/base current history1 history2 Visc@ 100°C cSt ASTM D445 15.1 14.8 14.8 14.6 CRAPHS Ferrous Alloys  Terrous Alloys  Viscosity @ 100°C   Viscosity @ 100°C   Debris Structure for the structure for	Debris scalar Visual NONE NONE NONE NONE NONE NONE Appearance scalar Visual NONE NONE NONE NONE NONE Appearance scalar Visual NORML NORML NORML NORML NORML Emulsified Water scalar Visual NORML NORML NORML NORML NORML NORML Emulsified Water scalar Visual NORML NORML NORML NORML NORML NORML SCALAR Visual SOLIT NEG NEG NEG NEG TEUD PROPERTIES method Imit/base current history1 history1 visco @ 100°C cSt ASTM D445 15.1 14.8 14.8 14.6 CRAPHS Ferrous Alloys Viscosity @ 100°C	Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
Sand/Dirit scalar Visual NONE NONE NONE NONE NORE Appearance scalar Visual NORML NORM NORM NORM NORM NORM NORM NORM NORM	Sand/Dirt scalar Visual NONE NONE NONE NONE NORML Appearance scalar Visual NORML NO	Silt	scalar	*Visual	NONE	NONE	NONE	NONE
Appearance scalar *Visual NORML NORM	Appearance scalar *Visual NORML NORM	Debris	scalar	*Visual	NONE	NONE	NONE	NONE
Odor       scalar       *Visual       NORML       NORM       NEG       NORM       NORM       NORM       NORM       NORM       NORM       Normality of the set	Octor       scalar       *Visual       NORML       NORM       NEG       NORM       Normality       Normality       Normality       Normality       Normality       Normality       Normality       Normality       Normality       Nore	Sand/Dirt	scalar	*Visual	NONE	NONE	NONE	NONE
Emulsified Water scalar *Visual >0.1 NEG NEG NEG NEG Free Water scalar *Visual NEG NEG NEG NEG FLUID PROPERTIES method limit/base current history1 history2 Visc @ 100°C cSt ASTM D445 15.1 14.8 14.8 14.6 GRAPHS Ferrous Alloys Graphic St	Emulsified Water scalar *Visual >0.1 NEG NEG NEG NEG Free Water scalar *Visual NEG NEG NEG NEG FLUID PROPERTIES method limit/base current history1 history1 visc @ 100°C cSt ASTM D445 15.1 14.8 14.8 14.8 14.6 GRAPHS Ferrous Alloys Ferrous Alloys Non-ferrous Metals Viscosity @ 100°C Viscosity @ 100°C	Appearance	scalar	*Visual	NORML	NORML	NORML	NORML
Free Water     scalar     *Visual     NEG     NEG     NEG       FLUID PROPERTIES     method     limit/base     current     history1     history2       Visc @ 100°C     cSt     ASTM D445     15.1     14.8     14.8     14.8       GRAPHS       Ferrous Alloys       Image: String of the string o	Free Water scalar "Visual NEG NEG NEG FLUID PROPERTIES method limit/base current history1 history: Visc @ 100°C cSt ASTM D445 15.1 14.8 14.8 14.6 GRAPHS Ferrous Alloys Terrous Metals Viscosity @ 100°C Viscosity @ 100°C Base Number	Odor	scalar	*Visual	NORML	NORML	NORML	NORML
FLUID PROPERTIES       method       limit/base       current       history1       history1         Visc @ 100°C       cSt       ASTM D445       15.1       14.8       14.8       14.6         GRAPHS         Ferrous Alloys         Image: Second Colspan="2">Graph Colspan="2">Base Number         Visc colspan="2">On-ferrous Metals         Image: Second Colspan="2">Colspan="2"         Colspan="2"       Colspan="2"         Colspan="2"       Colspan="2"         Colspan="2"       Colspan="2"         Colspan="2"       Colspan="2"         Colspan="2"        Colspan="2"         Colspan="2"         Colspan="2" <t< td=""><td>FLUID PROPERTIES       method       limit/base       current       history1       history1         Visc @ 100°C       cSt       ASTM D445       15.1       14.8       14.8       14.6         GRAPHS       Ferrous Alloys       Imit/base       Imit/base       Imit/base       Imit/base       14.8       14.8       14.6         Monterior       Imit/base       Imit/base</td><td>Emulsified Water</td><td>scalar</td><td>*Visual</td><td>&gt;0.1</td><td>NEG</td><td>NEG</td><td>NEG</td></t<>	FLUID PROPERTIES       method       limit/base       current       history1       history1         Visc @ 100°C       cSt       ASTM D445       15.1       14.8       14.8       14.6         GRAPHS       Ferrous Alloys       Imit/base       Imit/base       Imit/base       Imit/base       14.8       14.8       14.6         Monterior       Imit/base	Emulsified Water	scalar	*Visual	>0.1	NEG	NEG	NEG
Visc @ 100°C cst ASTM D445 15.1 14.8 14.8 14.8 14.6 GRAPHS Ferrous Alloys	Visc @ 100°C cSt ASTM D445 15.1 14.8 14.8 14.8 14.6 GRAPHS Ferrous Alloys Mon-ferrous Metals Viscosity @ 100°C	Free Water	scalar	*Visual		NEG	NEG	NEG
GRAPHS Ferrois Alloys	GRAPHS Ferrous Alloys	FLUID PROPE	ERTIES	method	limit/base	current	history1	history2
Ferrous Alloys	Ferrous Alloys	Visc @ 100°C	cSt	ASTM D445	15.1	14.8	14.8	14.6
Non-ferrous Metals	Anomal An	GRAPHS						
Non-ferrous Metals Viscosity @ 100°C	Viscosity @ 100°C							
Non-ferrous Metals	Anomal Base Number	iron			/			
Non-ferrous Metals	Non-ferrous Metals	chromium						
Non-ferrous Metals Viscosity @ 100°C	Non-ferrous Metals	5-						
Non-ferrous Metals Viscosity @ 100°C	Non-ferrous Metals							
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Viscosity @ 100°C	Viscosity @ 100°C Abnormal Base bnormal bnor	6						
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Abnormal         10.0         0           Base         0         0         0           Abnormal         2.0         0.0         0	Abnormal         10.0         Abnormal           Base         10.0         Abnormal           Abnormal         2.0         0.0	<sup>9</sup> T		1	12.0			
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Submitted By: Craig Johnson

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