

## **OIL ANALYSIS REPORT**

#### Area CONSTRUCTORS, INC Machine Id CHEVROLET GASOLINE 040605 Component

Gasoline Engine

MOBIL CLEAN 5W30 5000 (--- GAL)

#### DIAGNOSIS

#### Recommendation

Resample at the next service interval to monitor.

#### Wear

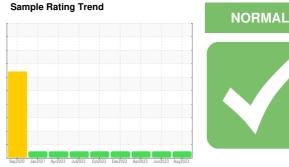
All component wear rates are normal.

#### 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 INFORMATION method limit/base current history1 history2   Sample Number Client Info SBP0004738 SBP000473 SBP000473 SBP000473 SBP000473 SBP00473 SBP00473 SBP00473 SBP00473 SBP00473 SBP00473 SBP00473 SBP00473 SBP00473 SBP00474 SBP005765 S1 O O SBP00474 SBP005765 S1 O <t< th=""><th></th><th></th><th>Sep2020 Jar</th><th>2021 Apr2022 Jul2022</th><th>Oct2022 Dec2022 Apr2023 Jun20</th><th>23 Aug2023</th><th></th></t<>			Sep2020 Jar	2021 Apr2022 Jul2022	Oct2022 Dec2022 Apr2023 Jun20	23 Aug2023	
Sample Date Client Info 16 Aug 2021 14 Jun 2023 07 Apr 2023   Machine Age hrs Client Info 2984 2705 2433   Oil Age hrs Client Info 279 272 285   Oil Changed Client Info Changed Chang Chang Changed </th <th>SAMPLE INFORM</th> <th>IATION</th> <th>method</th> <th>limit/base</th> <th>current</th> <th>history1</th> <th>history2</th>	SAMPLE INFORM	IATION	method	limit/base	current	history1	history2
Machine Age hrs Client Info 2984 2705 2433   Oil Age hrs Client Info 279 272 285   Oil Changed Client Info Changed Changed Changed Changed   Sample Status nethod Innit/base current history1 history2   Fuel WC Method >4.0 1.0 .0 .0   Glycol wC Method >4.0 .0 .0 .0 .0   WEAR METALS method imit/base current history1 history2   Iron ppm ASTM D5185m >5 6 .0 .0   Nickel ppm ASTM D5185m >2 0 .0 .0   Silver ppm ASTM D5185m >40 2 .7 .3   Lead ppm ASTM D5185m >10 0 .0 .0   Cadmium ppm ASTM D5185m 0 0 .0 .0	Sample Number		Client Info		SBP0004738	SBP0004493	SBP0003749
Oil Age hrs Client Info 279 272 285   Oil Changed Client Info Changed Changed Changed Changed   Sample Status Imit/base current history1 history2   Fuel WC Method >4.0 <1.0 <1.0 <1.0   Glycol WC Method >4.0 <1.0 <1.0 NEG   WEAR METALS method Imit/base current history1 history2   Iron ppm ASTM D5165m >5 6 Chromium ppm ASTM D5165m >2 0 0 0   Nickel ppm ASTM D5165m >5 <1 0 0 0   Silver ppm ASTM D5165m >0 0 0 0 0   Cadad ppm ASTM D5165m >5 <1 0 0 0   Silver ppm ASTM D5165m >5 <1 0 0 0   Aumin	Sample Date		Client Info		16 Aug 2023	14 Jun 2023	07 Apr 2023
Oil Changed Sample StatusClient InfoChanged NORMALChanged NORMALChanged NORMALChanged NORMALCONTAMINATIONmethodlimit/basecurrenthistory1history2FuelWC Method>4.0<	Machine Age	hrs	Client Info		2984	2705	2433
Sample Status NORMAL NORMAL NORMAL NORMAL NORMAL NORMAL   CONTAMINATION method limit/base current history1 history2   Fuel WC Method >4.0 <1.0 <1.0 <1.0 <1.0   Glycol WC Method NEG NEG NEG NEG   WEAR METALS method limit/base current history1 history2   Iron ppm ASTM D5185m >150 5 5 6   Chromium ppm ASTM D5185m >20 <1 0 0   Nickel ppm ASTM D5185m >20 <1 0 0   Silver ppm ASTM D5185m >20 0 0 0   Lead ppm ASTM D5185m >10 <1 0 0   Copper ppm ASTM D5185m 0 0 0 0   Cadaium pm ASTM D5185m 0 0 0 </th <th>Oil Age</th> <th>hrs</th> <th>Client Info</th> <th></th> <th>279</th> <th>272</th> <th>285</th>	Oil Age	hrs	Client Info		279	272	285
CONTAMINATION method limit/base current history1 history2   Fuel WC Method >4.0 <1.0 <1.0 <1.0 <1.0   Glycol WC Method NEG NEG NEG NEG   WEAR METALS method limit/base current history1 history2   Iron ppm ASTM D5185m<>150 5 5 6 O   Nickel ppm ASTM D5185m<>20 <1 0 0 O   Silver ppm ASTM D5185m<>20 0 0 0 O <td< th=""><th>Oil Changed</th><th></th><th>Client Info</th><th></th><th>Changed</th><th>Changed</th><th>Changed</th></td<>	Oil Changed		Client Info		Changed	Changed	Changed
Fuel WC Method >4.0 <1.0	Sample Status				NORMAL	NORMAL	NORMAL
Autor WC Method NEG NEG NEG NEG   WEAR METALS method limit/base current history1 history2   Iron ppm ASTM D5185m >150 5 5 6   Nickel ppm ASTM D5185m >20 <1 0 0   Nickel ppm ASTM D5185m >5 <1 0 0   Silver ppm ASTM D5185m >2 0 0 0   Lead ppm ASTM D5185m >2 0 0 0   Capper ppm ASTM D5185m >10 <1 0 0   Cadmium ppm ASTM D5185m 0 0 0 0   Cadmium ppm ASTM D5185m 0 0 0 0   Cadmium ppm ASTM D5185m 0 0 0 0   Vanadium ppm ASTM D5185m 24 37 69   Bariu	CONTAMINATION	J	method	limit/base	current	history1	history2
WEAR METALS method limit/base current history1 history2   Iron ppm ASTM D5185m >150 5 5 6   Chromium ppm ASTM D5185m >20 <1 0 0   Nickel ppm ASTM D5185m >2 0 0 0   Silver ppm ASTM D5185m >2 0 0 0   Aluminum ppm ASTM D5185m >6 0 0 0   Lead ppm ASTM D5185m >5 <1 0 0 0   Cadmium ppm ASTM D5185m >50 0 0 0 0   Cadmium ppm ASTM D5185m >10 <1 0 0 0   Cadmium ppm ASTM D5185m 0 0 0 0   Cadmium ppm ASTM D5185m 0 0 0 0   Magnases ppm ASTM D5185m 0 </th <th>Fuel</th> <th></th> <th>WC Method</th> <th>&gt;4.0</th> <th>&lt;1.0</th> <th>&lt;1.0</th> <th>&lt;1.0</th>	Fuel		WC Method	>4.0	<1.0	<1.0	<1.0
Iron ppm ASTM D5185m >150 5 5 6   Chromium ppm ASTM D5185m >20 <1 0 0   Nickel ppm ASTM D5185m >5 <1 0 0   Silver ppm ASTM D5185m >2 0 0 0   Aluminum ppm ASTM D5185m >40 2 7 3   Lead ppm ASTM D5185m >50 0 0 0   Copper ppm ASTM D5185m >50 0 0 0   Cadmium ppm ASTM D5185m >10 <1 0 0   Cadmium ppm ASTM D5185m 0 0 0 0   Cadmium ppm ASTM D5185m 0 0 0 0   Mangaines ppm ASTM D5185m 0 0 0 0   Manganesiam ppm ASTM D5185m 654 774 689	Glycol		WC Method		NEG	NEG	NEG
Chromium ppm ASTM D5185m >20 <1	WEAR METALS		method	limit/base	current	history1	history2
Nickel ppm ASTM D5185m >5 <1	Iron	ppm	ASTM D5185m	>150	5	5	6
Titanium ppm ASTM D5185m <1	Chromium	ppm	ASTM D5185m	>20	<1	0	0
Silver ppm ASTM D5185m >2 0 0 0   Aluminum ppm ASTM D5185m >40 2 7 3   Lead ppm ASTM D5185m >50 0 0 0   Copper ppm ASTM D5185m >155 <1 0 0   Tin ppm ASTM D5185m >10 <1 0 0   Vanadium ppm ASTM D5185m 0 0 0 0   Cadmium ppm ASTM D5185m 0 0 0 0   ADDITIVES method limit/base current history1 history2   Boron ppm ASTM D5185m 24 37 69   Barium ppm ASTM D5185m 70 71 72   Magnesee ppm ASTM D5185m 490 608 531   Calcium ppm ASTM D5185m 2959 3824 3108   Contractium p	Nickel	ppm	ASTM D5185m	>5	<1	0	0
Aluminum ppm ASTM D5185m >40 2 7 3   Lead ppm ASTM D5185m >50 0 0 0   Copper ppm ASTM D5185m >155 <1 0 0   Tin ppm ASTM D5185m >10 <1 0 0   Vanadium ppm ASTM D5185m >10 <1 0 0   Cadmium ppm ASTM D5185m 0 0 0 0   Cadmium ppm ASTM D5185m 24 37 69   Boron ppm ASTM D5185m 24 37 69   Barium ppm ASTM D5185m 70 71 72   Magnaese ppm ASTM D5185m 490 608 531   Calcium ppm ASTM D5185m 490 608 531   Calcium ppm ASTM D5185m 2959 3824 3108   Contaclium ppm ASTM D5185m<	Titanium	ppm	ASTM D5185m		<1	0	0
Lead ppm ASTM D5185m >50 0 0 0   Copper ppm ASTM D5185m >155 <1 0 0   Tin ppm ASTM D5185m >10 <1 0 0   Vanadium ppm ASTM D5185m >10 <1 0 0   Vanadium ppm ASTM D5185m 0 0 0 0   Cadmium ppm ASTM D5185m 0 0 0 0   ADDITIVES method limit/base current history1 history2   Boron ppm ASTM D5185m 24 37 69   Barium ppm ASTM D5185m 0 0 0   Magnaese ppm ASTM D5185m 70 71 72   Manganese ppm ASTM D5185m 490 608 531   Calcium ppm ASTM D5185m 490 608 840   Sulfur ppm ASTM	Silver	ppm	ASTM D5185m	>2	0	0	0
Copper ppm ASTM D5185m >155 <1	Aluminum	ppm	ASTM D5185m	>40	2	7	3
Tin ppm ASTM D5185m >10 <1	Lead	ppm	ASTM D5185m	>50	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 24 37 69   Barium ppm ASTM D5185m 0 0 0   Molybdenum ppm ASTM D5185m 70 71 72   Manganese ppm ASTM D5185m 70 71 72   Manganesium ppm ASTM D5185m 490 608 531   Calcium ppm ASTM D5185m 490 608 531   Calcium ppm ASTM D5185m 2959 3824 3108   CONTAMINANTS method limit/base current history1 history2   Solium ppm ASTM D5185m >30 9 8 7   Solium ppm ASTM D5185m 20 1	Copper	ppm	ASTM D5185m	>155	<1	0	0
Cadmium ppm ASTM D5185m 0 0 0   ADDITIVES method limit/base current history1 history2   Boron ppm ASTM D5185m 24 37 69   Barium ppm ASTM D5185m 0 0 0   Molybdenum ppm ASTM D5185m 70 71 72   Manganese ppm ASTM D5185m 490 608 531   Calcium ppm ASTM D5185m 213 1403 1264   Phosphorus ppm ASTM D5185m 2959 3824 3108   CONTAMINANTS method limit/base current history1 history2   Silicon ppm ASTM D5185m >30 9	Tin	ppm	ASTM D5185m	>10	<1	0	0
ADDITIVESmethodlimit/basecurrenthistory1history2BoronppmASTM D5185m243769BariumppmASTM D5185m000MolybdenumppmASTM D5185m707172ManganeseppmASTM D5185m<10<1MagnesiumppmASTM D5185m490608531CalciumppmASTM D5185m654774689ZincppmASTM D5185m654774689SulfurppmASTM D5185m295938243108CONTAMINANTSmethodlimit/basecurrenthistory1history2SiliconppmASTM D5185m>30987SodiumppmASTM D5185m>201<1<1INFRA-REDmethodlimit/basecurrenthistory1history2Soot %%'ASTM D7624>209.510.210.6SulfationAbs/cm'ASTM D7415>3021.522.721.1FLUID DEGRADATIONmethodlimit/basecurrenthistory1history2	Vanadium	ppm	ASTM D5185m		0	0	0
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Barium ppm ASTM D5185m 0 0 0   Molybdenum ppm ASTM D5185m 70 71 72   Manganese ppm ASTM D5185m <1 0 <1   Magnesium ppm ASTM D5185m <1 0 <1   Magnesium ppm ASTM D5185m 490 608 531   Calcium ppm ASTM D5185m 490 608 531   Calcium ppm ASTM D5185m 1213 1403 1264   Phosphorus ppm ASTM D5185m 654 774 689   Zinc ppm ASTM D5185m 2959 3824 3108   CONTAMINANTS method limit/base current history1 history2   Silicon ppm ASTM D5185m >30 9 8 7   Sodium ppm ASTM D5185m >20 1 <1 1   INFRA-RED method limit/base current	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum ppm ASTM D5185m 70 71 72   Manganese ppm ASTM D5185m <1 0 <1   Magnesium ppm ASTM D5185m 490 608 531   Calcium ppm ASTM D5185m 490 608 531   Calcium ppm ASTM D5185m 490 608 531   Calcium ppm ASTM D5185m 654 774 689   Zinc ppm ASTM D5185m 654 774 689   Sulfur ppm ASTM D5185m 2959 3824 3108   CONTAMINANTS method limit/base current history1 history2   Silicon ppm ASTM D5185m >30 9 8 7   Sodium ppm ASTM D5185m >20 1 <1 1   INFRA-RED method limit/base current history1 history2   Soot % % *ASTM D7844 <td< th=""><th>Boron</th><th>ppm</th><th>ASTM D5185m</th><th></th><th>24</th><th>37</th><th>69</th></td<>	Boron	ppm	ASTM D5185m		24	37	69
Manganese ppm ASTM D5185m <1	Barium	ppm	ASTM D5185m		0	0	0
Magnesium ppm ASTM D5185m 490 608 531   Calcium ppm ASTM D5185m 1213 1403 1264   Phosphorus ppm ASTM D5185m 654 774 689   Zinc ppm ASTM D5185m 654 774 689   Sulfur ppm ASTM D5185m 2959 3824 3108   CONTAMINANTS method limit/base current history1 history2   Silicon ppm ASTM D5185m >30 9 8 7   Sodium ppm ASTM D5185m >400 1 2 2   Potassium ppm ASTM D5185m >20 1 <1 <1   INFRA-RED method limit/base current history1 history2   Soot % % *ASTM D7844 0 0.1 0.1   Nitration Abs/cm *ASTM D7624 >20 9.5 10.2 10.6   Sulfation	Molybdenum	ppm	ASTM D5185m		70	71	72
Calcium ppm ASTM D5185m 1213 1403 1264   Phosphorus ppm ASTM D5185m 654 774 689   Zinc ppm ASTM D5185m 654 774 689   Sulfur ppm ASTM D5185m 788 966 840   Sulfur ppm ASTM D5185m 2959 3824 3108   CONTAMINANTS method limit/base current history1 history2   Silicon ppm ASTM D5185m >30 9 8 7   Sodium ppm ASTM D5185m >400 1 2 2   Potassium ppm ASTM D5185m >20 1 <1 <1   INFRA-RED method limit/base current history1 history2   Soot % % *ASTM D7844 0 0.1 0.1   Nitration Abs/:m *ASTM D7624 >20 9.5 10.2 10.6   Sulfation <	Manganese	ppm	ASTM D5185m		<1	0	<1
Phosphorus ppm ASTM D5185m 654 774 689   Zinc ppm ASTM D5185m 788 966 840   Sulfur ppm ASTM D5185m 2959 3824 3108   CONTAMINANTS method limit/base current history1 history2   Silicon ppm ASTM D5185m >30 9 8 7   Sodium ppm ASTM D5185m >400 1 2 2   Potassium ppm ASTM D5185m >20 1 <1 <1   INFRA-RED method limit/base current history1 history2   Soot % % *ASTM D7844 0 0.1 0.1   Nitration Abs/cm *ASTM D7624 >20 9.5 10.2 10.6   Sulfation Abs/.1m *ASTM D7415 >30 21.5 22.7 21.1	Magnesium	ppm			490	608	531
Zinc ppm ASTM D5185m 788 966 840   Sulfur ppm ASTM D5185m 2959 3824 3108   CONTAMINANTS method limit/base current history1 history2   Silicon ppm ASTM D5185m >30 9 8 7   Sodium ppm ASTM D5185m >400 1 2 2   Potassium ppm ASTM D5185m >400 1 2 2   NFRA-RED method limit/base current history1 history2   Soot % % *ASTM D7844 0 0.1 0.1   Nitration Abs/cm *ASTM D7624 >20 9.5 10.2 10.6   Sulfation Abs/.1mm *ASTM D7415 >30 21.5 22.7 21.1		ppm	ASTM D5185m		-	1403	
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CONTAMINANTSmethodlimit/basecurrenthistory1history2SiliconppmASTM D5185m>30987SodiumppmASTM D5185m>400122PotassiumppmASTM D5185m>201<1<1INFRA-REDmethodlimit/basecurrenthistory1history2Soot %%*ASTM D784400.10.1NitrationAbs/cm*ASTM D7624>209.510.210.6SulfationAbs/.Imm*ASTM D715>3021.522.721.1FLUID DEGRADATIONmethodlimit/basecurrenthistory1history2	-	ppm					
Silicon ppm ASTM D5185m >30 9 8 7   Sodium ppm ASTM D5185m >400 1 2 2   Potassium ppm ASTM D5185m >20 1 <1	Sulfur	ppm	ASTM D5185m		2959	3824	3108
Sodium ppm ASTM D5185m >400 1 2 2   Potassium ppm ASTM D5185m >20 1 <1 <1   INFRA-RED method limit/base current history1 history2   Soot % % *ASTM D7844 0 0.1 0.1   Nitration Abs/cm *ASTM D7624 >20 9.5 10.2 10.6   Sulfation Abs/.1mm *ASTM D7415 >30 21.5 22.7 21.1   FLUID DEGRADATION method limit/base current history1 history2	CONTAMINANTS		method	limit/base	current	history1	history2
Potassium ppm ASTM D5185m >20 1 <1	Silicon	ppm	ASTM D5185m	>30	9	8	7
INFRA-REDmethodlimit/basecurrenthistory1history2Soot %%*ASTM D784400.10.1NitrationAbs/cm*ASTM D7624>209.510.210.6SulfationAbs/.1mm*ASTM D7415>3021.522.721.1FLUID DEGRADATIONmethodlimit/basecurrenthistory1history2	Sodium	ppm	ASTM D5185m	>400	1	2	2
Soot % % *ASTM D7844 0 0.1 0.1   Nitration Abs/cm *ASTM D7624 >20 9.5 10.2 10.6   Sulfation Abs/.1mm *ASTM D7415 >30 21.5 22.7 21.1   FLUID DEGRADATION method limit/base current history1 history2	Potassium	ppm	ASTM D5185m	>20	1	<1	<1
Nitration Abs/cm *ASTM D7624 >20 9.5 10.2 10.6   Sulfation Abs/.1mm *ASTM D7415 >30 21.5 22.7 21.1   FLUID DEGRADATION method limit/base current history1 history2	INFRA-RED		method	limit/base	current	history1	history2
SulfationAbs/.1mm*ASTM D7415>3021.522.721.1FLUID DEGRADATIONmethodlimit/basecurrenthistory1history2	Soot %	%	*ASTM D7844		0	0.1	0.1
FLUID DEGRADATION method limit/base current history1 history2	Nitration	Abs/cm	*ASTM D7624	>20	9.5	10.2	10.6
	Sulfation	Abs/.1mm	*ASTM D7415	>30	21.5	22.7	21.1
Oxidation Abs/.1mm *ASTM D7414 >25 15.3 16.3 13.9	FLUID DEGRADA	TION	method	limit/base	current	history1	history2
	Oxidation	Abs/.1mm	*ASTM D7414	>25	15.3	16.3	13.9

3.8

Base Number (BN) mg KOH/g ASTM D2896

3.7

3.8



# **OIL ANALYSIS REPORT**

Ferrous Alloys

