

OIL ANALYSIS REPORT

Sample Rating Trend



729044-361494

Machine Id

Diesel Engine

CASTROL CRB Multi 15W-40 CK-4 (--- GAL)

SAMPLE INFORMATION method

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 Date Client Info 05 Dec 2023 24 Machine Age hrs Client Info 100 6i Oil Age hrs Client Info 100 6i Oil Changed Client Info Not Changd C Sample Status Not Changd C Fuel WC Method >3.0 <1.0 Fuel WC Method >0.2 NEG Glycol WC Method >0.2 NEG Wear 0 WC Method >0.2 NEG Wear 0 WC Method >0.2 NEG Wear 0 WC Method >0.2 NEG Wickel ppm ASTM D5185m >2.0 <1 1 Nickel ppm ASTM D5185m >2 0 1 Silver ppm ASTM D5185m >2 0 1 Copper ppm ASTM D5185m >15 <1 1 Adadium ppm AST	28 Nov 2023	GFL0090274
Machine Age hrs Client Info 5188 5 Oil Age hrs Client Info 100 60 Oil Changed Client Info Not Changd C Sample Status Imit/base Current NORMAL N CONTAMINATION method imit/base current Signol NEG Fuel WC Method >0.2 NEG NEG Signol Signol		09 Oct 2023
Oil Age hrs Client Info 100 64 Oil Changed Client Info Not Changd C Sample Status Client Info Not Changd C CONTAMINATION method imit/base current Fuel WC Method >3.0 <1.0 Water WC Method >0.2 NEG Glycol WC Method >0.2 NEG WEAR METALS method imit/base current Iron ppm ASTM D5185m >2.0 <1 Nickel ppm ASTM D5185m >2.0 <1 Nickel ppm ASTM D5185m >2.0 <1 Aluminum ppm ASTM D5185m >2.0 <1 Copper ppm ASTM D5185m >2.0 <1 Copper ppm ASTM D5185m >4.0 <1 Vanadium ppm ASTM D5185m >1.5 <1 Vanadium ppm ASTM D5185m 0 <1	5182	4957
Oil Changed Client Info Not Changed C Sample Status Image Image NORMAL N CONTAMINATION method imit/base current Fuel WC Method >3.0 <1.0 NEG Imit/base Current Glycol WC Method >0.2 NEG Image <	600	150
Sample Status NORMAL N CONTAMINATION method limit/base current Fuel WC Method >3.0 <1.0 Water WC Method >0.2 NEG Glycol WC Method >0.2 NEG WEAR METALS method limit/base current Iron ppm ASTM D5185m >12.0 41 Chromium ppm ASTM D5185m >2.0 <1 1 Nickel ppm ASTM D5185m >2.0 7 1 Lead ppm ASTM D5185m >2.0 7 1 Lead ppm ASTM D5185m >3.0 6 1 Vanadium ppm ASTM D5185m >15 <1 1 Vanadium ppm ASTM D5185m <4 1 Barium ppm ASTM D5185m <1 1 Molybdenum ppm ASTM D5185m 633 1 1 Magnesium	Changed	Not Changd
CONTAMINATION method limit/base current Fuel WC Method >3.0 <1.0 Water WC Method >0.2 NEG Glycol WC Method Imit/base current Iron ppm ASTM D5185m >120 41 Chromium ppm ASTM D5185m >20 <1 Nickel ppm ASTM D5185m >2 0 Aluminum ppm ASTM D5185m >2 0 Aluminum ppm ASTM D5185m >2 0 Aluminum ppm ASTM D5185m >2 0 Copper ppm ASTM D5185m >40 <1 Copper ppm ASTM D5185m >15 <1 Vanadium ppm ASTM D5185m <1 ADDITIVES method Imit/base current Boron ppm ASTM D5185m 4 Barium ppm ASTM D5185m 63	NORMAL	NORMAL
Fuel WC Method >3.0 <1.0	history1	history2
WaterWC Method>0.2NEGGlycolWC MethodNEGWEAR METALSmethodlimit/basecurrentIronppmASTM D5185m>12041ChromiumppmASTM D5185m>20<1NickelppmASTM D5185m>20SilverppmASTM D5185m>20AluminumppmASTM D5185m>207LeadppmASTM D5185m>3306TinppmASTM D5185m>3306TinppmASTM D5185m>15<1VanadiumppmASTM D5185m>15<1VanadiumppmASTM D5185m<00CadmiumppmASTM D5185m<00BoronppmASTM D5185m<630MolybdenumppmASTM D5185m<11MagneseppmASTM D5185m<11MagnesiumppmASTM D5185m<11PhosphorusppmASTM D5185m1069ZincppmASTM D5185m1069ZincppmASTM D5185m25SolfurppmASTM D5185m0PotassiumppmASTM D5185m20SiliconppmASTM D5185m203PitationppmASTM D5185m203SolfurppmASTM D5185m203SolfurppmASTM D5185m203SolfurppmAST	<1.0	<1.0
GlycolWC MethodNEGWEAR METALSmethodlimit/basecurrentIronppmASTM D5185m>12041ChromiumppmASTM D5185m>20<1NickelppmASTM D5185m>20SilverppmASTM D5185m>20AluminumppmASTM D5185m>207LeadppmASTM D5185m>3306TinppmASTM D5185m>3306TinppmASTM D5185m>15<1VanadiumppmASTM D5185m>15<1VanadiumppmASTM D5185m<0CadmiumppmASTM D5185m<63BoronppmASTM D5185m<63ManganeseppmASTM D5185m<63ManganeseppmASTM D5185m<970CalciumppmASTM D5185m1136PhosphorusppmASTM D5185m1069ZincppmASTM D5185m1246SulfurppmASTM D5185m257SodiumppmASTM D5185m>203INFRA-REDmethodlimit/basecurrentSoot %%%ASTM D7844>40.1NitrationAbs/.tm%ASTM D7845>3017.3ELUID DECENDADATIONmethodlimit/basecurrent	NEG	NEG
WEAR METALS method limit/base current Iron ppm ASTM D5185m >120 41 Chromium ppm ASTM D5185m >20 <1 Nickel ppm ASTM D5185m >20 <1 Titanium ppm ASTM D5185m >2 0 Silver ppm ASTM D5185m >2 0 Aluminum ppm ASTM D5185m >20 7 Lead ppm ASTM D5185m >40 <1 Copper ppm ASTM D5185m >330 6 Tin ppm ASTM D5185m >15 <1 Vanadium ppm ASTM D5185m 0 0 Cadmium ppm ASTM D5185m 63 4 Barium ppm ASTM D5185m 63 4 Magnesium ppm ASTM D5185m 63 4 Magnesium ppm ASTM D5185m 1136 4 Phosphorus <td< th=""><th>NEG</th><th>NEG</th></td<>	NEG	NEG
Iron ppm ASTM D5185m >120 41 Chromium ppm ASTM D5185m >20 <1 I Nickel ppm ASTM D5185m >2 0 I Titanium ppm ASTM D5185m >2 0 I Silver ppm ASTM D5185m >2 0 I Aluminum ppm ASTM D5185m >20 7 I Lead ppm ASTM D5185m >40 <1 I Copper ppm ASTM D5185m >330 6 I I Vanadium ppm ASTM D5185m >15 <1 I I Vanadium ppm ASTM D5185m Imit/base current I Boron ppm ASTM D5185m 4 I I I Barium ppm ASTM D5185m 0 I I I I I I I I I I I	history1	history2
Chromium ppm ASTM D5185m >20 <1	5	8
Nickel ppm ASTM D5185m >5 <1	0	<1
Titanium ppm ASTM D5185m >2 0 Silver ppm ASTM D5185m >2 0 Aluminum ppm ASTM D5185m >20 7 Lead ppm ASTM D5185m >40 <1 Copper ppm ASTM D5185m >330 6 Tin ppm ASTM D5185m >15 <1 Vanadium ppm ASTM D5185m >15 <1 Vanadium ppm ASTM D5185m 0 0 Cadmium ppm ASTM D5185m <1 0 Manganese ppm ASTM D5185m 4 3 Barium ppm ASTM D5185m 0 0 Molybdenum ppm ASTM D5185m 0 0 Magnesium ppm ASTM D5185m 970 2 Calcium ppm ASTM D5185m 1136 1 Phosphorus ppm ASTM D5185m 25 7 Sodium	0	0
Silver ppm ASTM D5185m >2 0 Aluminum ppm ASTM D5185m >20 7 1 Lead ppm ASTM D5185m >40 <1 Copper ppm ASTM D5185m >330 6 1 Vanadium ppm ASTM D5185m >15 <1 1 Vanadium ppm ASTM D5185m 0 0 1 Cadmium ppm ASTM D5185m <1 1 1 ADDITIVES method limit/base current 1 Boron ppm ASTM D5185m 4 1 1 Barium ppm ASTM D5185m 0 1 1 Magnesium ppm ASTM D5185m 970 1 1 1 Calcium ppm ASTM D5185m 1069 1 1 1 Phosphorus ppm ASTM D5185m 25 7 1 1 1 1 1	0	<1
AluminumppmASTM D5185m>207LeadppmASTM D5185m>40<1CopperppmASTM D5185m>3306TinppmASTM D5185m>15<1VanadiumppmASTM D5185m0CadmiumppmASTM D5185m0CadmiumppmASTM D5185m<1ADDITIVESmethodlimit/basecurrentBoronppmASTM D5185m4BariumppmASTM D5185m63ManganeseppmASTM D5185m63ManganeseppmASTM D5185m970CalciumppmASTM D5185m1136PhosphorusppmASTM D5185m1069ZincppmASTM D5185m1246SulfurppmASTM D5185m3319CONTAMINANTSmethodlimit/basecurrentSiliconppmASTM D5185m0PotassiumppmASTM D5185m20SodiumppmASTM D5185m203INFRA-REDmethodlimit/basecurrentSoot %%*ASTM D7844>40.1NitrationAbs/m*ASTM D7452>204.7SulfationAbs/m*ASTM D7455>3017.3	0	0
LeadppmASTM D5185m>40<1	<1	1
CopperppmASTM D5185m>3306TinppmASTM D5185m>15<1VanadiumppmASTM D5185m0CadmiumppmASTM D5185m<1ADDITIVESmethodlimit/basecurrentBoronppmASTM D5185m4BariumppmASTM D5185m63ManganeseppmASTM D5185m63ManganeseppmASTM D5185m<1MagnesiumppmASTM D5185m970CalciumppmASTM D5185m1136PhosphorusppmASTM D5185m1069ZincppmASTM D5185m3319CONTAMINANTSmethodlimit/basecurrentSiliconppmASTM D5185m0PotassiumppmASTM D5185m0PotassiumppmASTM D5185m20Soot %%*ASTM D5185m20Soot %%*ASTM D7844>4NitrationAbs/m*ASTM D7445>30Abs/1mm*ASTM D7415>3017.3	0	<1
Tin ppm ASTM D5185m >15 <1	1	1
VanadiumppmASTM D5185m0CadmiumppmASTM D5185m<1ADDITIVESmethodlimit/basecurrentBoronppmASTM D5185m4BariumppmASTM D5185m0MolybdenumppmASTM D5185m63ManganeseppmASTM D5185m63MagnesiumppmASTM D5185m970CalciumppmASTM D5185m970CalciumppmASTM D5185m1136PhosphorusppmASTM D5185m1246SulfurppmASTM D5185m3319CONTAMINANTSmethodlimit/basecurrentSiliconppmASTM D5185m>257SodiumppmASTM D5185m>203INFRA-REDmethodlimit/basecurrentSoot %%*ASTM D7844>40.1NitrationAbs/cm*ASTM D7624>204.7SulfationAbs/1mm*ASTM D7415>3017.3	<1	<1
CadmiumppmASTM D5185m<1	0	<1
ADDITIVESmethodlimit/basecurrentBoronppmASTM D5185m4BariumppmASTM D5185m0MolybdenumppmASTM D5185m63ManganeseppmASTM D5185m63MagnesiumppmASTM D5185m970CalciumppmASTM D5185m1136PhosphorusppmASTM D5185m1069ZincppmASTM D5185m1069ZincppmASTM D5185m3319CONTAMINANTSmethodlimit/basecurrentSiliconppmASTM D5185m203PotassiumppmASTM D5185m>203INFRA-REDmethodlimit/basecurrentSoot %%*ASTM D7844>40.1NitrationAbs/cm*ASTM D7844>204.7SulfationAbs/.1mm*ASTM D7415>3017.3	0	0
BoronppmASTM D5185m4BariumppmASTM D5185m00MolybdenumppmASTM D5185m63ManganeseppmASTM D5185m<1MagnesiumppmASTM D5185m970CalciumppmASTM D5185m970CalciumppmASTM D5185m1136PhosphorusppmASTM D5185m1069ZincppmASTM D5185m1246SulfurppmASTM D5185m3319CONTAMINANTSmethodlimit/basecurrentSiliconppmASTM D5185m>257SodiumppmASTM D5185m>203PotassiumppmASTM D5185m>203INFRA-REDmethodlimit/basecurrentSoot %%*ASTM D7844>40.1NitrationAbs/cm*ASTM D7624>204.7SulfationAbs/1mm*ASTM D7415>3017.3	history1	history2
BariumppmASTM D5185m0MolybdenumppmASTM D5185m63ManganeseppmASTM D5185m<1MagnesiumppmASTM D5185m970CalciumppmASTM D5185m970CalciumppmASTM D5185m1136PhosphorusppmASTM D5185m1069ZincppmASTM D5185m1246SulfurppmASTM D5185m3319CONTAMINANTSmethodlimit/basecurrentSiliconppmASTM D5185m>257SodiumppmASTM D5185m>203INFRA-REDmethodlimit/basecurrentSoot %%*ASTM D7844>40.1NitrationAbs/cm*ASTM D7624>204.7SulfationAbs/1mm*ASTM D7415>3017.3	<1	<1
MolybdenumppmASTM D5185m63ManganeseppmASTM D5185m<1MagnesiumppmASTM D5185m970CalciumppmASTM D5185m1136PhosphorusppmASTM D5185m1069ZincppmASTM D5185m1246SulfurppmASTM D5185m3319CONTAMINANTSmethodlimit/basecurrentSiliconppmASTM D5185m>257SodiumppmASTM D5185m>203PotassiumppmASTM D5185m>203INFRA-REDmethodlimit/basecurrentSoot %%*ASTM D7844>40.1NitrationAbs/cm*ASTM D7624>204.7SulfationAbs/1mm*ASTM D7415>3017.3	0	0
ManganeseppmASTM D5185m<1	53	56
Magnesium ppm ASTM D5185m 970 Calcium ppm ASTM D5185m 1136 1 Phosphorus ppm ASTM D5185m 1069 1 Zinc ppm ASTM D5185m 1246 0 Sulfur ppm ASTM D5185m 3319 1 CONTAMINANTS method limit/base current Silicon ppm ASTM D5185m >25 7 Sodium ppm ASTM D5185m >20 3 INFRA-RED method limit/base current Soot % % *ASTM D7844 >4 0.1 Nitration Abs/cm *ASTM D7844 >20 4.7 Sulfation Abs/.1mm *ASTM D7415 >30 17.3	0	<1
CalciumppmASTM D5185m1136PhosphorusppmASTM D5185m1069ZincppmASTM D5185m1246SulfurppmASTM D5185m3319CONTAMINANTSmethodlimit/basecurrentSiliconppmASTM D5185m>257SodiumppmASTM D5185m>203PotassiumppmASTM D5185m>203INFRA-REDmethodlimit/basecurrentSoot %%*ASTM D7844>40.1NitrationAbs/cm*ASTM D7624>204.7SulfationAbs/.1mm*ASTM D7415>3017.3	903	929
PhosphorusppmASTM D5185m1069ZincppmASTM D5185m1246SulfurppmASTM D5185m3319CONTAMINANTSmethodlimit/basecurrentSiliconppmASTM D5185m>257SodiumppmASTM D5185m0PotassiumppmASTM D5185m>203INFRA-REDmethodlimit/basecurrentSoot %%*ASTM D7844>40.1NitrationAbs/cm*ASTM D7624>204.7SulfationAbs/.1mm*ASTM D7415>3017.3	1052	993
ZincppmASTM D5185m1246SulfurppmASTM D5185m3319CONTAMINANTSmethodlimit/basecurrentSiliconppmASTM D5185m>257SodiumppmASTM D5185m00PotassiumppmASTM D5185m>203INFRA-REDmethodlimit/basecurrentSoot %%*ASTM D7844>40.1NitrationAbs/cm*ASTM D7624>204.7SulfationAbs/.1mm*ASTM D7415>3017.3	1002	967
SulfurppmASTM D5185m3319CONTAMINANTSmethodlimit/basecurrentSiliconppmASTM D5185m>257SodiumppmASTM D5185m00PotassiumppmASTM D5185m>203INFRA-REDmethodlimit/basecurrentSoot %%*ASTM D7844>40.1NitrationAbs/cm*ASTM D7624>204.7SulfationAbs/.1mm*ASTM D7415>3017.3	1009	1195
CONTAMINANTSmethodlimit/basecurrentSiliconppmASTM D5185m>257SodiumppmASTM D5185m00PotassiumppmASTM D5185m>203INFRA-REDmethodlimit/basecurrentSoot %%*ASTM D7844>40.1NitrationAbs/cm*ASTM D7624>204.7SulfationAbs/.1mm*ASTM D7415>3017.3	1009 1189	2847
SiliconppmASTM D5185m>257SodiumppmASTM D5185m00PotassiumppmASTM D5185m>203INFRA-REDmethodlimit/basecurrentSoot %%*ASTM D7844>40.1NitrationAbs/cm*ASTM D7624>204.7SulfationAbs/.1mm*ASTM D7415>3017.3	1009 1189 2718	history2
SodiumppmASTM D5185m0PotassiumppmASTM D5185m>203INFRA-REDmethodlimit/basecurrentSoot %%*ASTM D7844>40.1NitrationAbs/cm*ASTM D7624>204.7SulfationAbs/.1mm*ASTM D7415>3017.3	1009 1189 2718 history1	4
Potassium ppm ASTM D5185m >20 3 INFRA-RED method limit/base current Soot % % *ASTM D7844 >4 0.1 Nitration Abs/cm *ASTM D7624 >20 4.7 Sulfation Abs/.1mm *ASTM D7415 >30 17.3	1002 1009 1189 2718 history1 3	4
INFRA-REDmethodlimit/basecurrentSoot %%*ASTM D7844>40.1NitrationAbs/cm*ASTM D7624>204.7SulfationAbs/.1mm*ASTM D7415>3017.3	1002 1009 1189 2718 history1 3 4	2
Soot % % *ASTM D7844 >4 0.1 Nitration Abs/cm *ASTM D7624 >20 4.7 Sulfation Abs/.1mm *ASTM D7415 >30 17.3	1002 1009 1189 2718 history1 3 4 0	
Nitration Abs/cm *ASTM D7624 >20 4.7 Sulfation Abs/.1mm *ASTM D7415 >30 17.3	1002 1009 1189 2718 history1 3 4 0 history1	history2
Sulfation Abs/.1mm *ASTM D7415 >30 17.3	1002 1009 1189 2718 history1 3 4 0 history1 0.2	history2
	1002 1009 1189 2718 history1 3 4 0 history1 0.2 7.8	history2 0.3 6.2
PLOID DEGRADATION method imit/base current	1002 1009 1189 2718 history1 3 4 0 history1 0.2 7.8 18.6	history2 0.3 6.2 18.2
Oxidation Abs/.1mm *ASTM D7414 >25 13.4	1002 1009 1189 2718 history1 3 4 0 history1 0.2 7.8 18.6 history1	history2 0.3 6.2 18.2 history2
Base Number (BN) mg KOH/g ASTM D2896 10 9.1	1002 1009 1189 2718 history1 3 4 0 history1 0.2 7.8 18.6 history1 15.2	history2 0.3 6.2 18.2 history2 13.7
FLOID DEGRADATION method limit/base current	1002 1009 1189 2718 history1 3 4 0 history1 0.2 7.8 18.6	history2 0.3 6.2



OIL ANALYSIS REPORT





VISUAL		method				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 PROPEI	RTIES	method	limit/base	current	history1	history2
Visc @ 100°C	cSt	ASTM D445	15.5	14.1	13.5	13.8
GRAPHS						



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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)

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