

# **OIL ANALYSIS REPORT**

Sample Rating Trend



Machine Id O1 Component Diesel Engine Fluid AMSOIL ASM 0W20 (--- QTS)

# DIAGNOSIS

### A Recommendation

Oil and filter change at the time of sampling has been noted. 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.

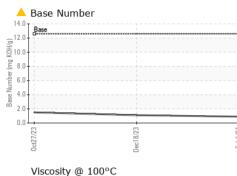
### Fluid Condition

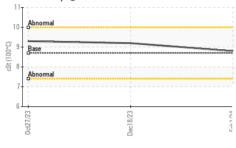
The BN level is low. The condition of the oil is acceptable for the time in service.

SAMPLE INFORM	<b>MATION</b>	method	limit/base	current	history1	history2
Sample Number		Client Info		PCA0071102	PCA0071101	PCA0071109
Sample Date		Client Info		01 Feb 2024	18 Dec 2023	27 Oct 2023
Machine Age	mls	Client Info		65000	60970	55000
Oil Age	mls	Client Info		5000	5100	5300
Oil Changed		Client Info		Changed	Changed	Changed
Sample Status				ABNORMAL	ABNORMAL	ABNORMAL
CONTAMINATI	ON	method	limit/base	current	history1	history2
Fuel		WC Method	>5	<1.0	<1.0	<1.0
Water		WC Method	>0.2	NEG	NEG	NEG
Glycol		WC Method		NEG	NEG	NEG
WEAR METALS	S	method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185m	>100	5	7	6
Chromium	ppm	ASTM D5185m	>20	<1	<1	<1
Nickel	ppm	ASTM D5185m	>4	0	<1	<1
Titanium	ppm	ASTM D5185m		0	<1	<1
Silver	ppm	ASTM D5185m	>3	0	0	0
Aluminum	ppm	ASTM D5185m	>20	3	3	2
Lead	ppm	ASTM D5185m	>40	0	0	<1
Copper	ppm	ASTM D5185m	>330	29	36	33
Tin	ppm	ASTM D5185m	>15	<1	0	0
Vanadium	ppm	ASTM D5185m		0	0	0
Cadmium	ppm	ASTM D5185m		0	0	0
ADDITIVES		method	limit/base	current	history1	history2
ADDITIVES Boron	ppm	method ASTM D5185m	limit/base	current 251	history1 230	history2 157
	ppm ppm		limit/base			
Boron		ASTM D5185m	limit/base	251	230	157
Boron Barium	ppm	ASTM D5185m ASTM D5185m	limit/base	251 0	230 9	157 0
Boron Barium Molybdenum	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	limit/base	251 0 207	230 9 210	157 0 186
Boron Barium Molybdenum Manganese	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base	251 0 207 <1	230 9 210 <1	157 0 186 <1
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base	251 0 207 <1 859	230 9 210 <1 881 1190 738	157 0 186 <1 808 1075 648
Boron Barium Molybdenum Manganese Magnesium Calcium	ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base	251 0 207 <1 859 1085	230 9 210 <1 881 1190	157 0 186 <1 808 1075
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	limit/base	251 0 207 <1 859 1085 693	230 9 210 <1 881 1190 738	157 0 186 <1 808 1075 648
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	limit/base	251 0 207 <1 859 1085 693 785	230 9 210 <1 881 1190 738 783	157 0 186 <1 808 1075 648 724
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		251 0 207 <1 859 1085 693 785 3058	230 9 210 <1 881 1190 738 783 3364	157 0 186 <1 808 1075 648 724 2835
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	limit/base	251 0 207 <1 859 1085 693 785 3058 current	230 9 210 <1 881 1190 738 783 3364 history1	157 0 186 <1 808 1075 648 724 2835 history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon	ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base >25	251 0 207 <1 859 1085 693 785 3058 current 9	230 9 210 <1 881 1190 738 783 3364 history1 9	157 0 186 <1 808 1075 648 724 2835 history2 8
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 <b>method</b> ASTM D5185m ASTM D5185m	limit/base >25	251 0 207 <1 859 1085 693 785 3058 current 9 4	230 9 210 <1 881 1190 738 783 3364 history1 9 1	157 0 186 <1 808 1075 648 724 2835 history2 8 4
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	limit/base >25 >20	251 0 207 <1 859 1085 693 785 3058 current 9 4	230 9 210 <1 881 1190 738 783 3364 history1 9 1 2	157 0 186 <1 808 1075 648 724 2835 history2 8 4 2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium	ppm ppm ppm ppm ppm ppm ppm ppm <b>TS</b> ppm ppm ppm	ASTM D5185m ASTM D5185m	limit/base >25 >20 limit/base >3	251 0 207 <1 859 1085 693 785 3058 current 9 4 0 0	230 9 210 <1 881 1190 738 783 3364 history1 9 1 2 2 history1	157 0 186 <1 808 1075 648 724 2835 history2 8 4 2 2 history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot %	ppm	ASTM D5185m ASTM D5185m	limit/base >25 >20 limit/base >3	251 0 207 <1 859 1085 693 785 3058 current 9 4 0 current 0.1	230 9 210 <1 881 1190 738 783 3364 history1 9 1 2 history1 0.1	157 0 186 <1 808 1075 648 724 2835 history2 8 4 2 2 8 4 2 1 1 5 0.1
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Solicon Sodium Potassium INFRA-RED Soot % Nitration	ppm ppm ppm ppm ppm ppm ppm ppm <b>TS</b> ppm ppm ppm ppm spm ppm spm ppm	ASTM D5185m ASTM D5185m	limit/base >25 >20 limit/base >3 >20	251 0 207 <1 859 1085 693 785 3058 current 9 4 0 current 0.1 9.9	230 9 210 <1 881 1190 738 783 3364 history1 9 1 2 history1 0.1 0.1 11.1	157 0 186 <1 808 1075 648 724 2835 history2 8 4 2 2 history2 0.1 11.0
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 <b>TS</b> ppm ppm ppm ppm spm ppm spm ppm	ASTM D5185m ASTM D5185m	limit/base >25 >20 limit/base >3 >20 >3 >20	251 0 207 <1 859 1085 693 785 3058 current 9 4 0 0 current 0.1 9.9 54.4	230 9 210 <1 881 1190 738 783 3364 history1 9 1 2 <u>history1</u> 0.1 0.1 11.1 61.2	157 0 186 <1 808 1075 648 724 2835 history2 8 4 2 2 history2 0.1 11.0 62.9
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 <b>TS</b> ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D7844 *ASTM D7844 *ASTM D7844	limit/base >25 >20 limit/base >3 >20 >30 limit/base	251 0 207 <1 859 1085 693 785 3058 current 9 4 0 current 0.1 9.9 54.4 current	230 9 210 <1 881 1190 738 783 3364 history1 9 1 2 history1 0.1 11.1 61.2 history1	157 0 186 <1 808 1075 648 724 2835 history2 8 4 2 2 history2 0.1 11.0 62.9 history2

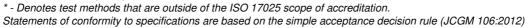


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	VISUAL		method	limit/base	current	history1	history2
	White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
	Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
	Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
	Silt	scalar	*Visual	NONE	NONE	NONE	NONE
	Debris	scalar	*Visual	NONE	NONE	NONE	NONE
	Sand/Dirt	scalar	*Visual	NONE	NONE	NONE	NONE
1/24	Appearance	scalar	*Visual	NORML	NORML	NORML	NORML
Feb	Odor	scalar	*Visual	NORML	NORML	NORML	NORML
	Emulsified Water	scalar	*Visual	>0.2	NEG	NEG	NEG
	Free Water	scalar	*Visual		NEG	NEG	NEG
-	FLUID PROP	ERTIES	method	limit/base	current	history1	history2
	Visc @ 100°C	cSt	ASTM D445	8.7	8.8	9.2	9.3
	GRAPHS						
	Ferrous Alloys						
	<sup>10</sup> T						
V CI L T	s chromium						
ٺ	HICKEI						
	E 6						
	b						
	4						
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	27/23	18/23		b1/24			
	Oct	Dec		-93 			
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	40 copper_1						
	35 - Jead						
	30			_			
	25 -						
	틆 20 -						
	15-						
	10						
	5-						
	7/23	8/23		1/24			
	0ct2	Dec1		Feb			
		C			Base Numbe	r	
	10.5 - Abnormal			14.0	Base		
	1						
	9.5			H0.0	1		
	() 9 Base 8.5 5 8		*****	.0 8.0	+		
	c.st []			(B/H0) 8.0 9.8 Winnber 9.0 8 Base 8 4.0	-		
				N 92 4 0	1		
	7.5 Abnormal			12 H.U			
				2.0			
	7.5 - Abnormal 7 - 6.5	23		2.0		23	
	7.5 - Abnormal 7 - 6.5	)ec18/23		2.0		)ec18/23	
	7.5 - <b>Abnomal</b> 7- 6.5	Dec18/23	on Ave., Carv	0.0	0ct27/23		JRAL SUPPL
Laboratory Sample No.	7.5 - Abnormal 7 - 6.5			0.0	0ct27/23	MERICAN NATI	
Laboratory	7.5 Abnomal 7 6.5 6 2 2 3 4 2 5 6 5 6 5 6 5 6 7 6 5 6 7 6 5 6 7 6 5 6 7 6 7 6 5 6 7 7 6 7 6 7 7 6 7 7 6 7 7 7 7 8 7 7 7 7 7 8 7 7 7 7 7 7 7 7 7 7 7 7 7	01 Madisc	ived : 07	2.0 0.0 +27513	0ct27/23	MERICAN NATI 12475 R	TE 119 HWY
Laboratory Sample No.	7.5 6.5 6.5 6.5 7 6.5 6.5 7 6.5 6.5 7 6.5 6.5 7 6.5 6.5 7 6.5 6.5 7 6.5 6.5 7 6.5 6.5 6.5 7 6.5 6.5 6.5 6.5 6.5 6.5 6.5 6.5	01 Madiso Rece Teste	ived : 07 ed : 08	, NC 27513 7 Feb 2024	0 <sup>ct21/23</sup>	MERICAN NATI 12475 R ROCHEST	JRAL SUPPL TE 119 HWY FER MILLS, F US 1577 COTT KINTE
	C.L. 0.70	Silt Debris Sand/Dirt Appearance Odor Emulsified Water Free Water Free Water Visc @ 100°C GRAPHS Ferrous Alloys Non-ferrous Met 40 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	Silt scalar Debris scalar Sand/Dirt scalar Appearance scalar Odor scalar Emulsified Water scalar Free Water scalar Fluid PROPERTIES Visc @ 100°C cSt GRAPHS Ferrous Alloys Non-ferrous Metals Uscosity @ 100°C Uscosity @ 100°C	Silt scalar "Visual Debris scalar "Visual Sand/Dirt scalar "Visual Appearance scalar "Visual Odor scalar "Visual Emulsified Water scalar "Visual Free Water scalar "Visual Non-ferrous Alloys Non-ferrous Metals Uscosity @ 100°C Uscosity @ 100°C	Silt scalar "Visual NONE Debris scalar "Visual NONE Sand/Dirt scalar "Visual NONE Appearance scalar "Visual NORML Odor scalar "Visual NORML Ddor scalar "Visual NORML Emulsified Water scalar "Visual >0.2 Free Water scalar "Visual S.7 GRAPHS Ferrous Alloys Ono-ferrous Metals Ono-ferrous Metals Uscosity @ 100°C Uscosity @ 100°C	Silt scalar Visual NONE NONE Debris scalar Visual NONE NONE Appearance scalar Visual NORML NORML Odor scalar Visual NORML NORML Emulsified Water scalar Visual NORML NORML Free Water scalar Visual NORM NORML Visc @ 100°C cSt ASTM D445 8.7 8.8 GRAPHS Ferrous Alloys Ferrous Alloys 0 0 0 0 0 0 0 0 0 0 0 0 0	Silt scalar Visual NONE NONE NONE NONE Debris scalar Visual NONE NONE NONE NONE Appearance scalar Visual NORML NORML NORML Odor scalar Visual NORML NORML NORML NORML Emulsified Water scalar Visual >0.2 NEG NEG Free Water scalar Visual >0.2 NEG NEG Free Water scalar Visual >0.2 NEG NEG Free Water Scalar Visual NORML NORML NORML Visc @ 100°C cSt ASTM D445 8.7 8.8 9.2 GRAPHS Ferrous Alloys Totometer Scalar Visual NORMS NORML NORML Viscosity @ 100°C Viscosity @ 100°C



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