

OIL ANALYSIS REPORT

Sample Rating Trend



BLUE STAR NHC LAURENS - BLUE STAR

Diesel Engine

NAPA Motor Oil 15W40 (--- GAL)

DIAGNOSIS

Recommendation

Resample at the next service interval to monitor.

Wear

Metal levels are typical for a new component breaking in.

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.

	IATION	method	limit/base	current	history1	history2
Sample Number		Client Info		WC0901696		
Sample Date		Client Info		26 Mar 2024		
Machine Age	hrs	Client Info		137		
Oil Age	hrs	Client Info		50		
Oil Changed		Client Info		Changed		
Sample Status				NORMAL		
CONTAMINATION	N	method	limit/base	current	history1	history2
Fuel		WC Method	>5	<1.0		
Water		WC Method	>0.2	NEG		
Glycol		WC Method		NEG		
WEAR METALS		method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185m	>100	5		
Chromium	ppm	ASTM D5185m	>20	<1		
Nickel	ppm	ASTM D5185m	>4	<1		
Titanium	ppm	ASTM D5185m		<1		
Silver	ppm	ASTM D5185m	>3	0		
Aluminum	ppm	ASTM D5185m	>20	4		
Lead	ppm	ASTM D5185m	>40	<1		
Copper	ppm	ASTM D5185m	>330	3		
Tin	ppm	ASTM D5185m	>15	1		
Vanadium	ppm	ASTM D5185m		<1		
Codmium						
Cadmium	ppm	ASTM D5185m		<1		
ADDITIVES	ppm	ASTM D5185m method	limit/base	<1 current	history1	history2
	ppm		limit/base			
ADDITIVES		method	limit/base	current	history1	history2
ADDITIVES Boron	ppm	method ASTM D5185m	limit/base	current 83	history1	history2
ADDITIVES Boron Barium	ppm ppm	method ASTM D5185m ASTM D5185m	limit/base	current 83 1	history1 	history2
ADDITIVES Boron Barium Molybdenum	ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m	limit/base	current 83 1 77	history1 	history2
ADDITIVES Boron Barium Molybdenum Manganese	ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base	current 83 1 77 2	history1 	history2
ADDITIVES Boron Barium Molybdenum Manganese Magnesium	ppm ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base	current 83 1 77 2 32	history1 	history2
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium	ppm ppm ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base	current 83 1 77 2 32 2084	history1	history2
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus	ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base	Current 83 1 77 2 32 2084 1030	history1	history2
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc	ppm ppm ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base	current 83 1 77 2 32 2084 1030 1167	history1	history2
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur	ppm ppm ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m		Current 83 1 77 2 32 2084 1030 1167 4060	history1	history2
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS	ppm ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base	current 83 1 77 2 32 2084 1030 1167 4060 current	history1 history1	history2 history2
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon	ppm ppm ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185m	limit/base	current 83 1 77 2 32 2084 1030 1167 4060 current 8	history1 history1	history2 history2
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium	ppm ppm ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185m	limit/base	current 83 1 77 2 32 2084 1030 1167 4060 current 8 3	history1 history1	history2
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium	ppm ppm ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185m	limit/base >25 >20	current 83 1 77 2 32 2084 1030 1167 4060 current 8 3 3	history1 history1	history2 history2 history2
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED	ppm ppm ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185m	limit/base >25 >20 limit/base	current 83 1 77 2 32 2084 1030 1167 4060 current 8 3 3 3 3 current	history1 history1 history1 history1	history2 history2 history2 history2
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED Soot %	ppm	method ASTM D5185m	limit/base >25 >20 limit/base >3	current 83 1 77 2 32 2084 1030 1167 4060 current 8 3 3 current 0.1	history1 history1 history1 history1 history1 history1	history2 history2 history2 history2 history2
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED Soot % Nitration	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185m	limit/base >25 >20 limit/base >3 >20	current 83 1 77 2 32 2084 1030 1167 4060 current 8 3 current 0.1 5.8	history1 history1 history1 history1 history1	history2 history2
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m	Imit/base >25 >20 Imit/base >3 >20 >30	current 83 1 77 2 32 2084 1030 1167 4060 current 8 3 3 current 0.1 5.8 15.4	history1 history1 history1	history2 history2 history2



OIL ANALYSIS REPORT

FT-IR (Direct Trend)		VISUAL		method	limit/base	curre	nt history1	history2
0 - Oxidation Nitration		White Metal	scalar	*Visual	NONE	LIGHT		
5 - Sulfation		Yellow Metal	scalar	*Visual	NONE	NONE		
0-		Precipitate	scalar	*Visual	NONE	NONE		
5+		Silt	scalar	*Visual	NONE	NONE		
0+		Debris	scalar	*Visual	NONE	NONE		
5		Sand/Dirt	scalar	*Visual	NONE	NONE		
Mar26/24	Mar26/24	Appearance	scalar	*Visual	NORML	NORM		
Mar	Mari	Odor	scalar	*Visual	NORML	NORM		
Base Number		Emulsified Water	scalar	*Visual	>0.2	NEG		
		Free Water	scalar	*Visual		NEG		
0-		FLUID PROPER	TIES	method	limit/base	curre	nt history1	history2
0		Visc @ 100°C	cSt	ASTM D445		14.0		
0		GRAPHS						
0-		Ferrous Alloys						
Mar26/24	VUJC	10 8 8						
—	8 W	6-						
Viscosity @ 100°C		E C						
7		4-						
Abnormal		2-						
5- 4		0						
2		6/24			6/24 -			
2 +		Mar26/24			Mar26/24			
		Non-ferrous Meta	ls					
Mar26/24	V G G C	10 copper						
Mar	h li se	8 - Bessesses lead						
		6						
		4						
		2						
			*****	*****				
		r/26/24			ır26/24			
		Ma	_		Ma			
		Viscosity @ 100°C	2			Base Nu	mber	
		17-			6.0			
		Abnormal			5.0	-		
		16			(B)HOX 84.0 What 4.0 What 4.0			
		()-01 15- 14-			Ĕ.			
		ਰੱ ¹⁴			- qun			
		13 - Abnormal			2.0 ase	-		
		12-			1.0			
		11			0.0	L		
		Mar26/24			Mar26/24	Mar26/24		£030≂M
		Mar			Mar	Mar		- M
	e No.	: WearCheck USA - 50 : WC0901696 : 06142850	1 Madiso Recei Teste	i ved : 09	7, NC 27513 9 Apr 2024 0 Apr 2024		CAROLINA POW 445	W GROVER S SHELBY, NO
Lab Nu	Number :	: 10967658	Diagr	nosed : 10) Apr 2024 - W	es Davis		
Certificate L2367 Test Pa	Number : Ickage :	: FLEET	-			es Davis		Contact: PAIG
Lab Nu	Number	: FLEET contact Customer Serv	rice at 1-8	800-237-136	9.	es Davis	paige@carolinapow	US 2815 Contact: PAIG rersolutions.cor : (704)481-078

Contact/Location: PAIGE ? - CARSHE Page 2 of 2