

Sample Rating Trend

NORMAL

Machine Id

HYUNDAI L-4 - HYUNDAI

Component Diesel Engine Fluid

FLEETLINE SUPERFLEET XHD 15W40 (12 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.

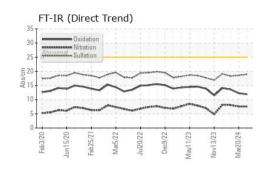
Fluid Condition

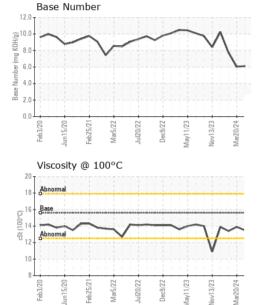
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

SAMPLE INFORI	MATION	method	limit/base	current	history1	history2					
Sample Number		Client Info		PCA0109963	LP0001597	LP0001349					
Sample Date		Client Info		20 May 2024	20 Mar 2024	12 Jan 2024					
Machine Age	hrs	Client Info		11406	10978	10550					
Oil Age	hrs	Client Info		428	428	467					
Oil Changed		Client Info		Changed	Changed	Changed					
Sample Status				NORMAL	NORMAL	NORMAL					
CONTAMINAT	ION	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 method limit/base current history1 history2											
Iron	ppm	ASTM D5185m	>100	6	4	4					
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	<1	3	1					
Lead	ppm	ASTM D5185m	>40	6	4	2					
Copper	ppm	ASTM D5185m	>330	<1	2	<1					
Tin	ppm	ASTM D5185m	>15	0	1	<1					
Vanadium	ppm	ASTM D5185m		<1	<1	0					
Cadmium	ppm	ASTM D5185m		0	<1	0					
ADDITIVES		method	limit/base	current	history1	history2					
ADDITIVES Boron	ppm	method ASTM D5185m	limit/base	current 4	history1 12	history2 20					
	ppm ppm		limit/base								
Boron		ASTM D5185m	limit/base	4	12	20					
Boron Barium	ppm	ASTM D5185m ASTM D5185m	limit/base	4 0	12 1	20 0					
Boron Barium Molybdenum	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	limit/base	4 0 10	12 1 23	20 0 54					
Boron Barium Molybdenum Manganese	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base	4 0 10 0	12 1 23 <1	20 0 54 0					
Boron Barium Molybdenum Manganese Magnesium	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base	4 0 10 0 79	12 1 23 <1 130	20 0 54 0 356					
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	4 0 10 0 79 2147	12 1 23 <1 130 2107	20 0 54 0 356 1566					
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	4 0 10 0 79 2147 849	12 1 23 <1 130 2107 878	20 0 54 0 356 1566 910					
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	4 0 10 0 79 2147 849 1050	12 1 23 <1 130 2107 878 1042	20 0 54 0 356 1566 910 1087					
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	limit/base	4 0 10 0 79 2147 849 1050 4489	12 1 23 <1 130 2107 878 1042 3866	20 0 54 0 356 1566 910 1087 3516					
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 ASTM D5185m	limit/base	4 0 10 0 79 2147 849 1050 4489 current	12 1 23 <1 130 2107 878 1042 3866 history1	20 0 54 0 356 1566 910 1087 3516 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 method ASTM D5185m	limit/base >25	4 0 10 0 79 2147 849 1050 4489 current 4	12 1 23 <1 130 2107 878 1042 3866 history1 5	20 0 54 0 356 1566 910 1087 3516 history2 5					
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 method ASTM D5185m	limit/base >25	4 0 10 79 2147 849 1050 4489 <u>current</u> 4	12 1 23 <1 130 2107 878 1042 3866 history1 5 0	20 0 54 0 356 1566 910 1087 3516 history2 5 0					
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	4 0 10 0 79 2147 849 1050 4489 current 4 0 <1	12 1 23 <1 130 2107 878 1042 3866 history1 5 0 3	20 0 54 0 356 1566 910 1087 3516 history2 5 0 14					
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED	ppm ppm ppm ppm ppm ppm ppm ppm TS	ASTM D5185m ASTM D5185m	limit/base >25 >20 limit/base >3	4 0 10 0 79 2147 849 1050 4489 current 4 0 <1 current	12 1 23 <1 130 2107 878 1042 3866 history1 5 0 3 history1	20 0 54 0 356 1566 910 1087 3516 history2 5 0 14 history2					
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	limit/base >25 >20 limit/base >3	4 0 10 0 79 2147 849 1050 4489 <i>current</i> 4 0 <1 <i>current</i> 0.2	12 1 23 <1 130 2107 878 1042 3866 history1 5 0 3 history1 0.1	20 0 54 0 356 1566 910 1087 3516 history2 5 0 14 history2 0.1					
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	limit/base >25 >20 limit/base >3 >20	4 0 10 0 79 2147 849 1050 4489 <i>current</i> 4 0 <1 <i>current</i> 0.2 7.6	12 1 23 <1 130 2107 878 1042 3866 history1 5 0 3 history1 0.1 7.6	20 0 54 0 356 1566 910 1087 3516 history2 5 0 14 history2 0.1 8.1					
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	limit/base >25 >20 limit/base >3 >20 >3 >30	4 0 10 0 79 2147 849 1050 4489 <u>current</u> 4 0 <1 <u>current</u> 0.2 7.6 18.9	12 1 23 <1 130 2107 878 1042 3866 history1 5 0 3 history1 0.1 7.6 18.6	20 0 54 0 356 1566 910 1087 3516 history2 5 0 14 history2 0.1 8.1 18.3					
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	limit/base >25 >20 limit/base >3 >20 >30 >30	4 0 10 0 79 2147 849 1050 4489 <i>current</i> 4 0 <1 <i>current</i> 0.2 7.6 18.9	12 1 23 <1 130 2107 878 1042 3866 history1 5 0 3 history1 0.1 7.6 18.6 history1	20 0 54 0 356 1566 910 1087 3516 history2 5 0 14 history2 0.1 8.1 18.3 history2					



OIL ANALYSIS REPORT





	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
3/23	Appearance	scalar	*Visual	NORML	NORML	NORML	NORML
Nov13/23 Mar20/24	Odor	scalar	*Visual	NORML	NORML	NORML	NORML
	Emulsified Water	scalar	*Visual	>0.2	NEG	NEG	NEG
	Free Water	scalar	*Visual		NEG	NEG	NEG
\sim	FLUID PROPE	RTIES	method	limit/base	current	history1	history2
	Visc @ 100°C	cSt	ASTM D445	15.6	13.5	13.9	13.4
	GRAPHS						
	Iron (ppm)				Lead (ppm)		
	250 Severe			10	Severe		
Nov13/23 - Mar20/24 -	200 - Severe			8			
Mai	E 150 100 - Abnormal			E G	Abnormal		
				4			
	50-			2			
	20 21 22 22	22	723		/20 /20	722	24
	Feb3/20 Jun15/20 Feb25/21 Mar5/22	Jul20/22 Dec9/22	May11/23 Nov13/23	Mar20/24	Feb3/20 Jun15/20 Feb25/21	Mar5/22 - Jul20/22 - Dec9/22 -	May11/23 Nov13/23 Mar20/24
\sim	Aluminum (ppm)	-	≥ z	2	Chromium (p	-	2 2 2
	⁵⁰ Tarran			5			
V	40 - Severe			4	0 Severe		
	_ 30 -						
3/23	a 20 - Abnormal			en al construction de la constru	Abnormal		
Nov13/23 Mar20/24	10-			1			
	0			1	0		
	Feb3/20 Jun15/20 Feb25/21 Mar5/22	Jul20/22 Dec9/22	May11/23 Nov13/23	Mar20/24	Feb3/20 Jun15/20 Feb25/21	Mar5/22 Jul20/22 Dec9/22	May11/23 Nov13/23 Mar20/24
	Feb Feb	Julž	May1 Nov1	Mar2	Feb Jun1 Feb	Ma Jul2 Dec	May ¹ Nov1 Mar2
	Copper (ppm)				Silicon (ppm)		
	400 Severe			8	⁰ Severe		
	300 -			6	.0		
	퉡 200 -			<u></u> 4	0		
	100 -				Abnormal		
						~	
	/20 /20	122	/23		/20	22	/23+
	Feb3/20 Jun15/20 Feb25/21 Mar5/22	Jul20/22 Dec9/22	May11/23 Nov13/23	Mar20/24	Feb3/20 Jun15/20 Feb25/21	Mar5/22 Jul20/22 Dec9/22	May11/23 Nov13/23 Mar20/24
	Viscosity @ 100°C	-	2 2	~	Base Number		2 4 2
	20 T			12.	0-		
	18 - Abnormal			(B/HO) Bayes end for the set of t			\sim
	0 16 Base 14 Abnormal			Bu 8.	0	\sim	1
	Abnormal		\sim		0		
	10-		V	N Se 2	.0		
	8	2		0.	0	2	
	Feb3/20 Jun15/20 Feb25/21 Mar5/22	Jul20/22 Dec9/22	May11/23 Nov13/23	Mar20/24	Feb3/20 Jun15/20 Feb25/21	Mar5/22 Jul20/22 Dec9/22	May11/23 Nov13/23 Mar20/24
	Jur Fet	nr ag	May	Ma	Jun Feb	M uu ga	May Nov Mar
oratory	· WearCheck LISA ED	1 Madica		NC 27512		SMIO	USSO & SON
nple No.	: PCA0109963	Rece		n Ave., Cary, NC 27513 red : 30 May 2024			NORFOLK S
Number	: 06196024	Teste		221	WALPOLE, N		
	r : 06196024 Tested : 02 Jun 2024 W/ er : 11058147 Diagnosed : 02 Jun 2024 - Don Baldridge W/						
	: 11058147	Diagr	10sed : 02	Jun 2024 - Dor	n Baldridge		US 0208

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)

Report Id: SMLWALNC [WUSCAR] 06196024 (Generated: 06/06/2024 03:23:33) Rev: 1

Certificate 12367

Contact/Location: PAUL BECKMAN - SMLWALNC

T: (508)668-2603

F: (508)660-0232

pbeckman@smlorusso.com