

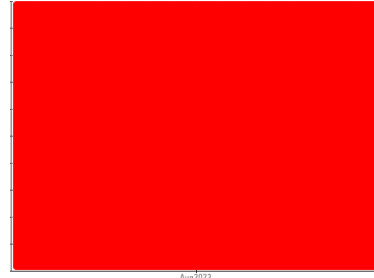


PROBLEM SUMMARY

Sample Rating Trend

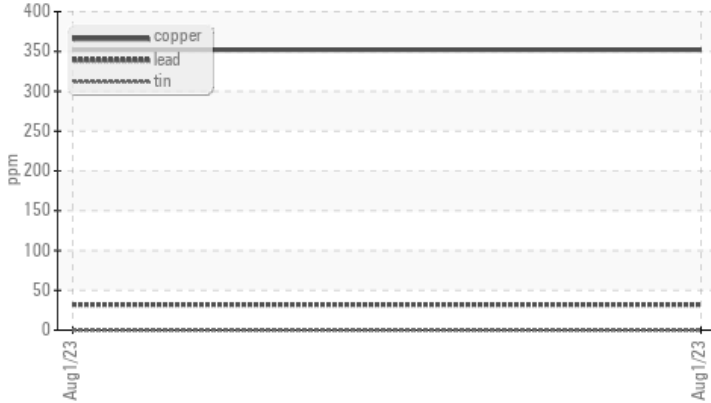
WEAR PARTICLES

Machine Id
HARLEY-DAVIDSON 2021 HARLEY-DAVIDSON
Component
Filter
Fluid
GASOLINE ENGINE OIL SAE 20W50 (--- GAL)



COMPONENT CONDITION SUMMARY

▲ Non-ferrous Metals



RECOMMENDATION

We understand that this sample is for warranty/insurance purposes. We understand that corrective action has already been taken. Diagnostician's Note: Oil from the filter was used to assess the contamination and oil condition. There was no water present in the oil, and no indication from the filter of a previous water contamination (i.e. no rust or scale present). The filter contained a very high concentration of wear particles indicative of a rapid catastrophic engine failure.

PROBLEMATIC TEST RESULTS

Sample Status			SEVERE	---	---
Lead	ppm	ASTM D5185(m)	▲ 32	---	---
Copper	ppm	ASTM D5185(m)	▲ 352	---	---
Ferrous Rubbing	Scale 0-10	ASTM D7684*	● 8		
Ferrous Sliding	Scale 0-10	ASTM D7684*	● 8		
Ferrous Rolling	Scale 0-10	ASTM D7684*	● 7		
Nonferrous Rolling	Scale 0-10	ASTM D7684*	● 4		
Patch Weight	mg	ASTM D7684*	● 1528	---	---

Customer Id: ACTFON
Sample No.: WC486637
Lab Number: 02575028
Test Package: INS-F



To manage this report scan the QR code

To discuss the diagnosis or test data:
Bill Quesnel CLS,OMA II,MLA-III,LLA-I +1
(289)291-4641 x4641
Bill.Quesnel@wearcheck.com

To change component or sample information:
Gloria Gonzalez +1 (289)291-4643 x4643
gloria.gonzalez@wearcheck.com

RECOMMENDED ACTIONS

There are no recommended actions for this sample.

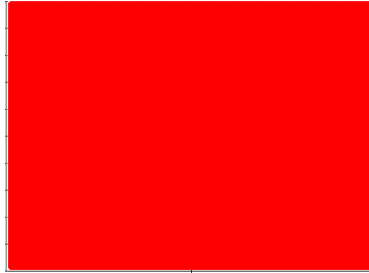
HISTORICAL DIAGNOSIS



OIL ANALYSIS REPORT

Sample Rating Trend

WEAR PARTICLES



Machine Id
HARLEY-DAVIDSON 2021 HARLEY-DAVIDSON
Component
Filter
Fluid
GASOLINE ENGINE OIL SAE 20W50 (--- GAL)

DIAGNOSIS

Recommendation

We understand that this sample is for warranty/insurance purposes. We understand that corrective action has already been taken. Diagnostician's Note: Oil from the filter was used to assess the contamination and oil condition. There was no water present in the oil, and no indication from the filter of a previous water contamination (i.e. no rust or scale present). The filter contained a very high concentration of wear particles indicative of a rapid catastrophic engine failure.

Wear Particles

Wear particle analysis indicates that the ferrous rolling, patch weight and ferrous sliding, nonferrous rolling and ferrous rubbing particles are severe. Copper, lead ppm levels are abnormal.

Contaminants

The water content is negligible. The filter contained only normal levels of contaminants, and debris. All filter contaminant levels are normal.

SAMPLE INFORMATION

	method	limit/base	current	history1	history2
Sample Number	Client Info		WC486637	---	---
Sample Date	Client Info		01 Aug 2023	---	---
Machine Age	hrs	Client Info	0	---	---
Oil Age	hrs	Client Info	0	---	---
Oil Changed	Client Info		N/A	---	---
Sample Status			SEVERE	---	---

WEAR METALS

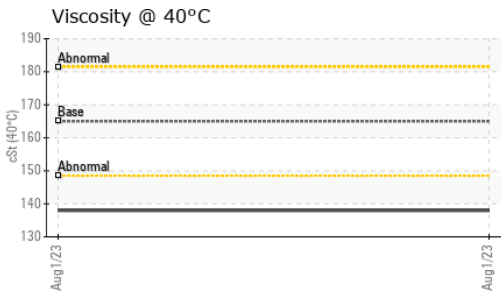
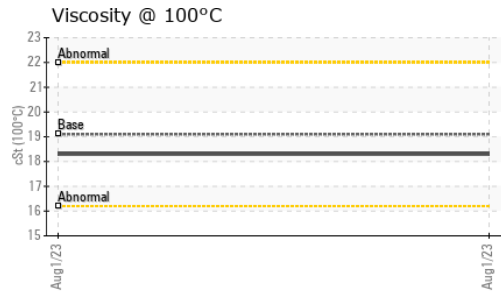
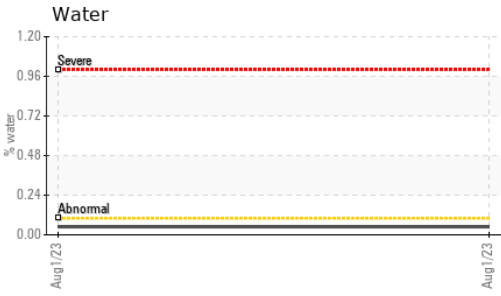
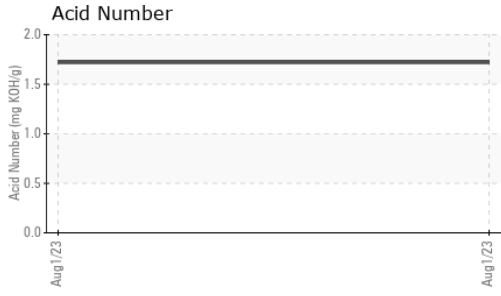
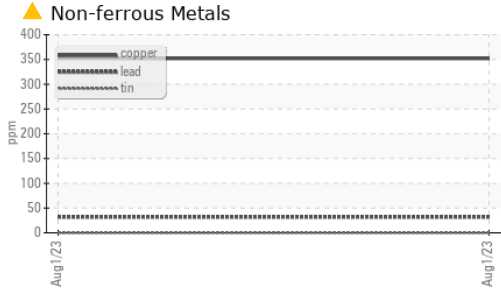
	method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185(m)	17	---	---
Chromium	ppm	ASTM D5185(m)	<1	---	---
Nickel	ppm	ASTM D5185(m)	0	---	---
Titanium	ppm	ASTM D5185(m)	0	---	---
Silver	ppm	ASTM D5185(m)	<1	---	---
Aluminum	ppm	ASTM D5185(m)	8	---	---
Lead	ppm	ASTM D5185(m)	▲ 32	---	---
Copper	ppm	ASTM D5185(m)	▲ 352	---	---
Tin	ppm	ASTM D5185(m)	0	---	---
Antimony	ppm	ASTM D5185(m)	0	---	---
Vanadium	ppm	ASTM D5185(m)	0	---	---
Beryllium	ppm	ASTM D5185(m)	0	---	---
Cadmium	ppm	ASTM D5185(m)	0	---	---

FERROGRAPHY

	method	limit/base	current	history1	history2
Ferrous Rubbing	Scale 0-10	ASTM D7684*	8		
Ferrous Sliding	Scale 0-10	ASTM D7684*	8		
Ferrous Cutting	Scale 0-10	ASTM D7684*			
Ferrous Rolling	Scale 0-10	ASTM D7684*	7		
Ferrous Break-in	Scale 0-10	ASTM D7684*			
Ferrous Spheres	Scale 0-10	ASTM D7684*			
Ferrous Black Oxides	Scale 0-10	ASTM D7684*			
Ferrous Red Oxides	Scale 0-10	ASTM D7684*			
Ferrous Corrosive	Scale 0-10	ASTM D7684*			
Ferrous Other	Scale 0-10	ASTM D7684*			
Nonferrous Rubbing	Scale 0-10	ASTM D7684*	5		
Nonferrous Sliding	Scale 0-10	ASTM D7684*			
Nonferrous Cutting	Scale 0-10	ASTM D7684*			
Nonferrous Rolling	Scale 0-10	ASTM D7684*	4		
Nonferrous Other	Scale 0-10	ASTM D7684*			
Sand/Dirt	Scale 0-10	ASTM D7684*	1		
Fibres	Scale 0-10	ASTM D7684*			
Spheres	Scale 0-10	ASTM D7684*			
Other	Scale 0-10	ASTM D7684*			
Patch Weight	mg	ASTM D7684*	1528	---	---



OIL ANALYSIS REPORT



ADDITIVES	method	limit/base	current	history1	history2
Boron	ppm	ASTM D5185(m) 75	19	---	---
Barium	ppm	ASTM D5185(m) 5	<1	---	---
Molybdenum	ppm	ASTM D5185(m) 100	31	---	---
Manganese	ppm	ASTM D5185(m)	<1	---	---
Magnesium	ppm	ASTM D5185(m) 12	51	---	---
Calcium	ppm	ASTM D5185(m) 2100	2051	---	---
Phosphorus	ppm	ASTM D5185(m) 650	886	---	---
Zinc	ppm	ASTM D5185(m) 850	951	---	---
Sulfur	ppm	ASTM D5185(m) 2500	2610	---	---
Lithium	ppm	ASTM D5185(m)	<1	---	---

CONTAMINANTS	method	limit/base	current	history1	history2
Silicon	ppm	ASTM D5185(m)	13	---	---
Sodium	ppm	ASTM D5185(m)	4	---	---
Potassium	ppm	ASTM D5185(m) >20	2	---	---
Water	%	ASTM D6304*	0.049	---	---
ppm Water	ppm	ASTM D6304*	494.7	---	---

FLUID DEGRADATION	method	limit/base	current	history1	history2
Acid Number (AN)	mg KOH/g	ASTM D974*	1.72	---	---

FLUID PROPERTIES	method	limit/base	current	history1	history2
Visc @ 40°C	cSt	ASTM D7279(m) 165	138	---	---
Visc @ 100°C	cSt	ASTM D7279(m) 19.1	18.3	---	---
Viscosity Index (VI)	Scale	ASTM D2270* 131	148	---	---

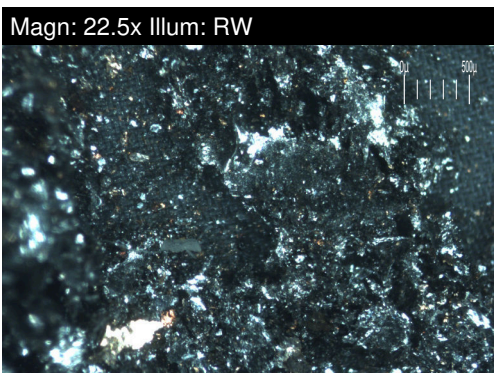
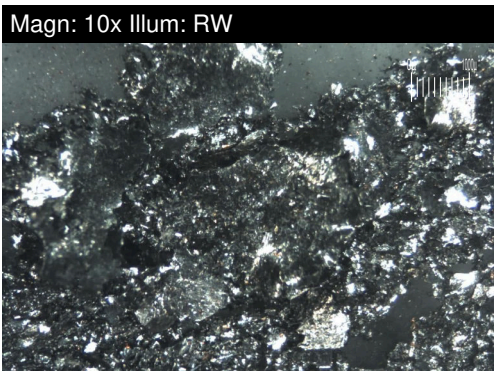
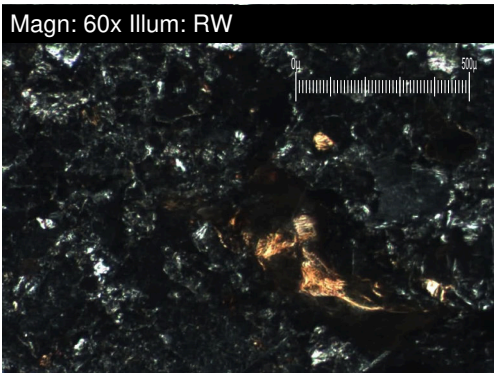
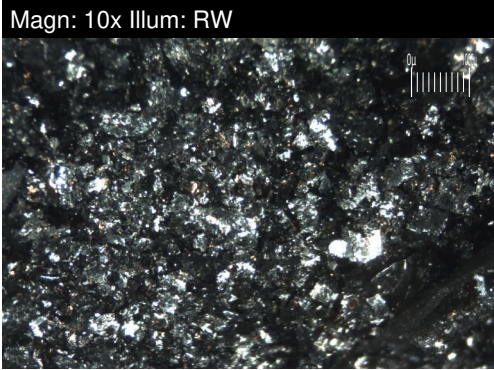
SAMPLE IMAGES	method	limit/base	current	history1	history2	
Color				no image	no image	no image
Bottom				no image	no image	no image



Laboratory : WearCheck - C8-1175 Appleby Line, Burlington, ON L7L 5H9 **Action Appraisal and Consultants Inc.**
Sample No. : WC486637 **Received** : 09 Aug 2023 546 Niagara Street
Lab Number : 02575028 **Diagnosed** : 30 Aug 2023 Welland, ON
Unique Number : 5620079 **Diagnostician** : Bill Quesnel CA L3C 1L8
Test Package : INS-F (Additional Tests: ICP, KF, KV100, KV40, PQ, TAN AUTO, TAN Man, VI) Contact: Blake Priestly
blake@aprz.ca
 To discuss this sample report, contact Customer Service at 1-800-268-2131. T: (905)892-5753
 Test denoted (*) outside scope of accreditation, (m) method modified, (e) tested at external lab. F: (905)892-0920
 Validity of results and interpretation are based on the sample and information as supplied.

FILTER REPORT

Machine Id
HARLEY-DAVIDSON 2021 HARLEY-DAVIDSON
 Component
Filter
 Fluid
GASOLINE ENGINE OIL SAE 20W50 (--- GAL)



FERROGRAPHY		method	limit/base	current	history1	history2
Ferrous Rubbing	Scale 0-10	ASTM D7684*		■ 8		
Ferrous Sliding	Scale 0-10	ASTM D7684*		■ 8		
Ferrous Cutting	Scale 0-10	ASTM D7684*				
Ferrous Rolling	Scale 0-10	ASTM D7684*		■ 7		
Ferrous Break-in	Scale 0-10	ASTM D7684*				
Ferrous Spheres	Scale 0-10	ASTM D7684*				
Ferrous Black Oxides	Scale 0-10	ASTM D7684*				
Ferrous Red Oxides	Scale 0-10	ASTM D7684*				
Ferrous Corrosive	Scale 0-10	ASTM D7684*				
Ferrous Other	Scale 0-10	ASTM D7684*				
Nonferrous Rubbing	Scale 0-10	ASTM D7684*		■ 5		
Nonferrous Sliding	Scale 0-10	ASTM D7684*				
Nonferrous Cutting	Scale 0-10	ASTM D7684*				
Nonferrous Rolling	Scale 0-10	ASTM D7684*		■ 4		
Nonferrous Other	Scale 0-10	ASTM D7684*				
Sand/Dirt	Scale 0-10	ASTM D7684*		■ 1		
Fibres	Scale 0-10	ASTM D7684*				
Spheres	Scale 0-10	ASTM D7684*				
Other	Scale 0-10	ASTM D7684*				
Patch Weight	mg	ASTM D7684*		■ 1528	---	---

WEAR

Wear particle analysis indicates that the ferrous rolling, patch weight and ferrous sliding, nonferrous rolling and ferrous rubbing particles are severe. Copper, lead ppm levels are abnormal.

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