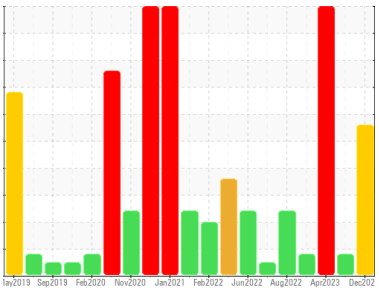
PROBLEM SUMMARY

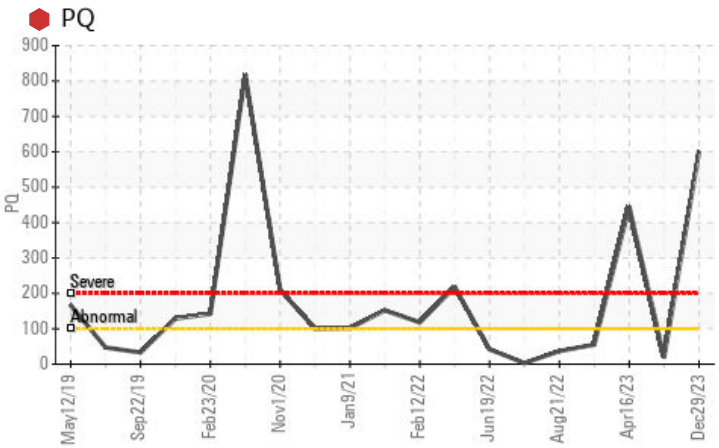
Sample Rating Trend

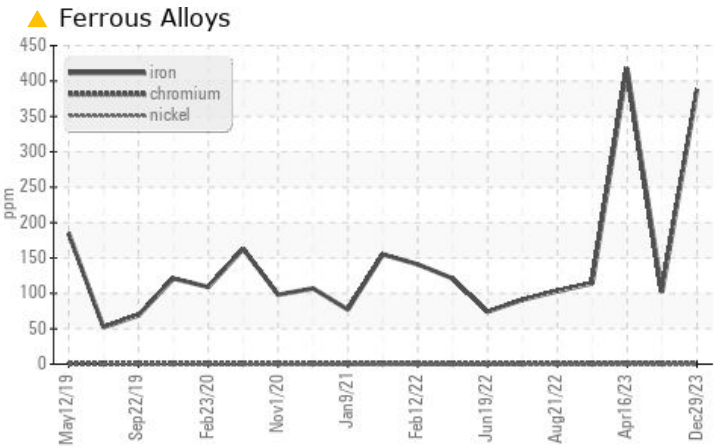


WEAR

Machine Id
Timm Plunger 6
Component
Gearbox
Fluid
SHELL OMALA 68 (1 LTR)

COMPONENT CONDITION SUMMARY





RECOMMENDATION

We recommend that you drain the oil from the component if this has not already been done. We recommend an early resample to monitor this condition.

PROBLEMATIC TEST RESULTS

Sample Status				SEVERE	ABNORMAL	SEVERE
PQ		ASTM D8184*		601	19	445
Iron	ppm	ASTM D5185(m)	>200	388	102	418
Ferrous Rubbing	Scale 0-10	ASTM D7684*			10	

Customer Id: TMMCPLAS
Sample No.: CB0031411
Lab Number: 02607990
Test Package: IND 3

To manage this report scan the QR code

To discuss the diagnosis or test data:
Kevin Marson +1 (289)291-4644 x4644
Kevin.Marson@wearcheck.com

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

RECOMMENDED ACTIONS

Action	Status	Date	Done By	Description
Change Fluid	---	---	?	We recommend that you drain the oil from the component if this has not already been done.
Resample	---	---	?	We recommend an early resample to monitor this condition.

HISTORICAL DIAGNOSIS

11 Sep 2023 Diag: Kevin Marson

WEAR PARTICLES

We recommend that you drain the oil from the component if this has not already been done. We recommend an early resample to monitor this condition.Wear particle analysis indicates that the ferrous rubbing particles are abnormal. There is no indication of any contamination in the oil. The AN level is acceptable for this fluid. The oil is no longer serviceable as a result of the abnormal and/or severe wear.

view report

16 Apr 2023 Diag: Kevin Marson

WEAR

We recommend that you drain the oil from the component if this has not already been done. We recommend an early resample to monitor this condition.Iron ppm levels are severe. PQ levels are severe. Wear particle analysis indicates that the ferrous rubbing particles are abnormal. A sharp increase in the iron level is noted. Gear wear is indicated. The very high ferrous density (PQ) index indicates that severe wear is occurring. There is no indication of any contamination in the oil. The AN level is acceptable for this fluid. The oil is no longer serviceable as a result of the abnormal and/or severe wear.

view report

17 Nov 2022 Diag: Kevin Marson

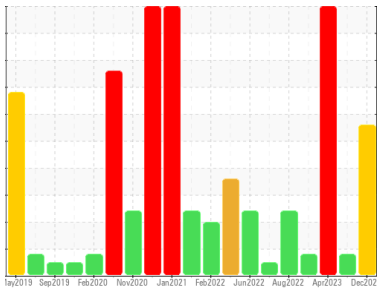
WEAR PARTICLES

No corrective action is recommended at this time. We recommend an early resample to monitor this condition.Wear particle analysis indicates that the ferrous rubbing particles are marginal. All other component wear rates are normal. There is no indication of any contamination in the oil. The AN level is acceptable for this fluid. The condition of the oil is suitable for further service.

view report

OIL ANALYSIS REPORT

Sample Rating Trend



WEAR

Machine Id
Timm Plunger 6
Component
Gearbox
Fluid
SHELL OMALA 68 (1 LTR)

DIAGNOSIS

Recommendation

We recommend that you drain the oil from the component if this has not already been done. We recommend an early resample to monitor this condition.

Wear

PQ levels are severe. Iron ppm levels are abnormal. Wear particle analysis indicates that the ferrous rubbing particles are abnormal. Gear wear is indicated. The very high ferrous density (PQ) index indicates that severe wear is occurring.

Contaminants

There is no indication of any contamination in the oil.

Oil Condition

The AN level is acceptable for this fluid. The oil is no longer serviceable as a result of the abnormal and/or severe wear.

SAMPLE INFORMATION		method	limit/base	current	history1	history2
Sample Number		Client Info		**CB0031411**	CB0031374	CB0030739
Sample Date		Client Info		**29 Dec 2023**	11 Sep 2023	16 Apr 2023
Machine Age	mths	Client Info		**0**	0	0
Oil Age	mths	Client Info		**0**	0	0
Oil Changed		Client Info		**N/A**	N/A	N/A
Sample Status				**SEVERE**	ABNORMAL	SEVERE

CONTAMINATION		method	limit/base	current	history1	history2
Water		WC Method	>0.2	**NEG**	NEG	NEG

WEAR METALS		method	limit/base	current	history1	history2
PQ		ASTM D8184*		**601**	19	445
Iron	ppm	ASTM D5185(m)	>200	**388**	102	418
Chromium	ppm	ASTM D5185(m)	>15	**<1**	<1	<1
Nickel	ppm	ASTM D5185(m)	>15	**0**	0	0
Titanium	ppm	ASTM D5185(m)		**0**	0	0
Silver	ppm	ASTM D5185(m)		**0**	0	0
Aluminum	ppm	ASTM D5185(m)	>25	**<1**	0	<1
Lead	ppm	ASTM D5185(m)	>100	**0**	0	0
Copper	ppm	ASTM D5185(m)	>200	**1**	1	<1
Tin	ppm	ASTM D5185(m)	>25	**0**	0	0
Antimony	ppm	ASTM D5185(m)	>5	**0**	0	0
Vanadium	ppm	ASTM D5185(m)		**0**	0	0
Beryllium	ppm	ASTM D5185(m)		**0**	0	0
Cadmium	ppm	ASTM D5185(m)		**0**	0	0

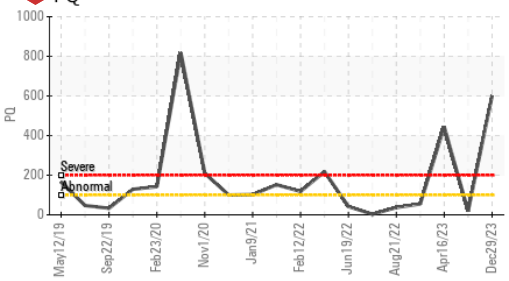
ADDITIVES		method	limit/base	current	history1	history2
Boron	ppm	ASTM D5185(m)		**<1**	<1	<1
Barium	ppm	ASTM D5185(m)		**0**	0	0
Molybdenum	ppm	ASTM D5185(m)		**6**	0	0
Manganese	ppm	ASTM D5185(m)		**1**	<1	2
Magnesium	ppm	ASTM D5185(m)		**<1**	<1	0
Calcium	ppm	ASTM D5185(m)		**1**	<1	0
Phosphorus	ppm	ASTM D5185(m)		**300**	320	327
Zinc	ppm	ASTM D5185(m)		**14**	8	10
Sulfur	ppm	ASTM D5185(m)		**8048**	7992	8223
Lithium	ppm	ASTM D5185(m)		**<1**	<1	<1

CONTAMINANTS		method	limit/base	current	history1	history2
Silicon	ppm	ASTM D5185(m)	>50	**2**	3	2
Sodium	ppm	ASTM D5185(m)		**0**	<1	<1
Potassium	ppm	ASTM D5185(m)	>20	**<1**	0	<1

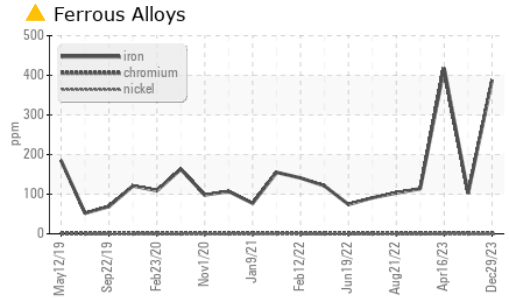
FLUID DEGRADATION		method	limit/base	current	history1	history2
Acid Number (AN)	mg KOH/g	ASTM D974*		**0.24**	0.32	0.44

OIL ANALYSIS REPORT

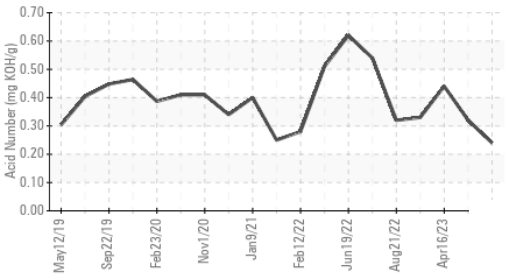
PQ



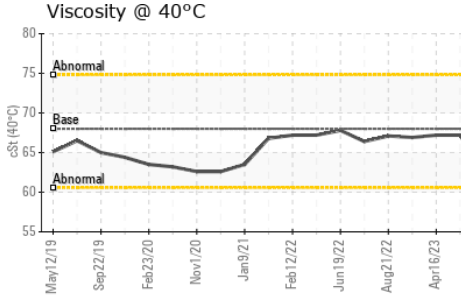
Ferrous Alloys



Acid Number

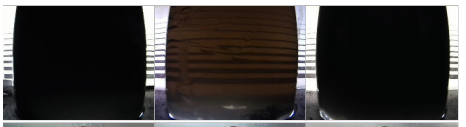


Viscosity @ 40°C



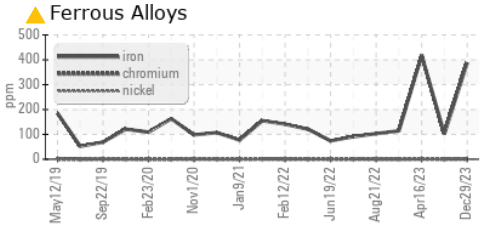
VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	Visual*	NONE	**NONE**	LIGHT	VLITE
Yellow Metal	scalar	Visual*	NONE	**NONE**	NONE	NONE
Precipitate	scalar	Visual*	NONE	**NONE**	NONE	NONE
Silt	scalar	Visual*	NONE	**LIGHT**	LIGHT	LIGHT
Debris	scalar	Visual*	NONE	**NONE**	NONE	NONE
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 PROPERTIES		method	limit/base	current	history1	history2
Visc @ 40°C	cSt	ASTM D7279(m)	68.0	**62.7**	67.2	67.2

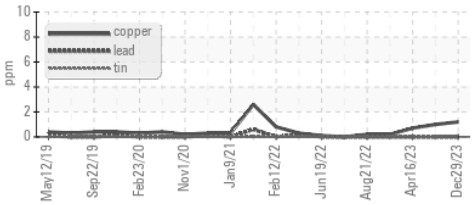
SAMPLE IMAGES	method	limit/base	current	history1	history2
Color					
Bottom					

GRAPHS

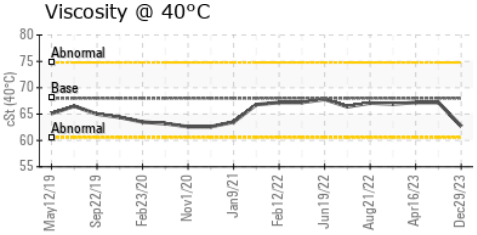
Ferrous Alloys



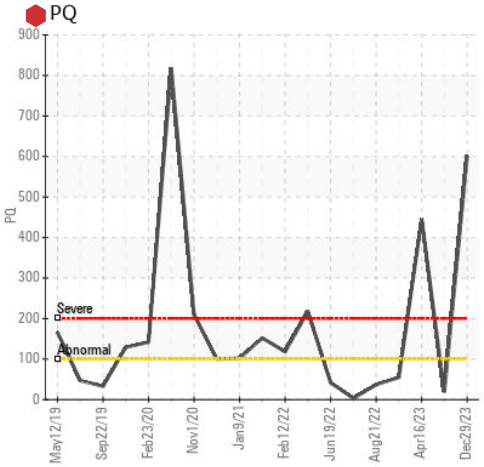
Non-ferrous Metals



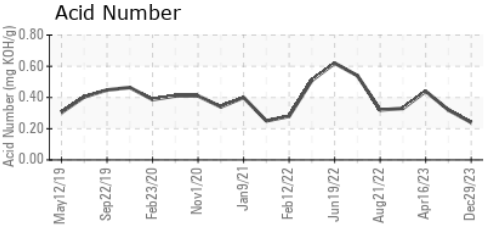
Viscosity @ 40°C



PQ



Acid Number



ISO 17025:2017 Accredited Laboratory

Laboratory : WearCheck - C8-1175 Appleby Line, Burlington, ON L7L 5H9 **TOYOTA MOTOR MANUFACTURING CANADA**
Sample No. : CB0031411 **Recieved** : 10 Jan 2024 PLASTICS DEPARTMENT, 1717 DUNDAS ST
Lab Number : 02607990 **Diagnosed** : 16 Jan 2024 WOODSTOCK, ON
Unique Number : 5709076 **Diagnostician** : Kevin Marson CA N4S 0A4
Test Package : IND 3 Contact: Jeff Lafleur

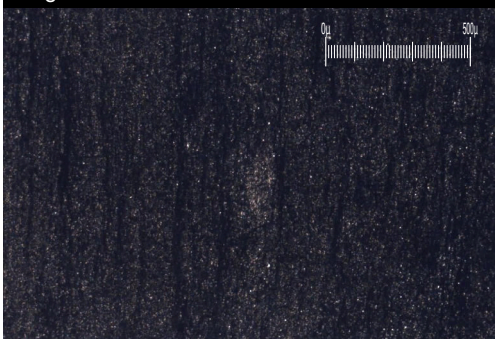
To discuss this sample report, contact Customer Service at 1-800-268-2131. jeff.lafleur@toyota.com
Test denoted (*) outside scope of accreditation, (m) method modified, (e) tested at external lab. T: (519)653-1111
Validity of results and interpretation are based on the sample and information as supplied. F:

FERROGRAPHY REPORT

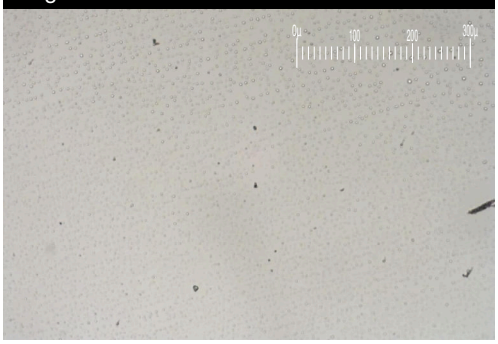
Machine Id
Timm Plunger 6
Component
Gearbox
Fluid
SHELL OMALA 68 (1 LTR)

Magn: 200x Illum: BC

Magn: 50x Illum: RW



Magn: 100x Illum: RW

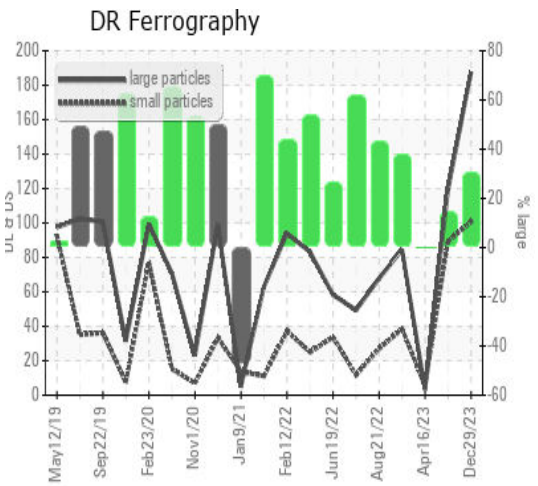


DR-FERROGRAPHY		method	limit/base	current	history1	history2
Large Particles		DR-Ferr*		**187.5**	119.4	3.4
Small Particles		DR-Ferr*		**100.6**	89.4	5.5
Total Particles		DR-Ferr*	>---	**288.1**	208.8	8.9
Large Particles Percentage	%	DR-Ferr*		**30.2**	14.4	0
Severity Index		DR-Ferr*		**16294**	3582	7

FERROGRAPHY		method	limit/base	current	history1	history2
Ferrous Rubbing	Scale 0-10	ASTM D7684*		▲	10	▲
Ferrous Sliding	Scale 0-10	ASTM D7684*				
Ferrous Cutting	Scale 0-10	ASTM D7684*				
Ferrous Rolling	Scale 0-10	ASTM D7684*		**4**	4	4
Ferrous Break-in	Scale 0-10	ASTM D7684*				
Ferrous Spheres	Scale 0-10	ASTM D7684*				
Ferrous Black Oxides	Scale 0-10	ASTM D7684*		**1**		
Ferrous Red Oxides	Scale 0-10	ASTM D7684*				
Ferrous Corrosive	Scale 0-10	ASTM D7684*				2
Ferrous Other	Scale 0-10	ASTM D7684*				
Nonferrous Rubbing	Scale 0-10	ASTM D7684*				
Nonferrous Sliding	Scale 0-10	ASTM D7684*				
Nonferrous Cutting	Scale 0-10	ASTM D7684*				
Nonferrous Rolling	Scale 0-10	ASTM D7684*				
Nonferrous Other	Scale 0-10	ASTM D7684*				1
Carbonaceous Material	Scale 0-10	ASTM D7684*				
Lubricant Degradation	Scale 0-10	ASTM D7684*				
Sand/Dirt	Scale 0-10	ASTM D7684*		**1**	1	1
Fibres	Scale 0-10	ASTM D7684*				
Spheres	Scale 0-10	ASTM D7684*				
Other	Scale 0-10	ASTM D7684*		**1**	1	2

WEAR

PQ levels are severe. Iron ppm levels are abnormal. Wear particle analysis indicates that the ferrous rubbing particles are abnormal. Gear wear is indicated. The very high ferrous density (PQ) index indicates that severe wear is occurring.



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