



UIN 03BE0FE

Gasoline Engine

Unit No. Outback

Unit:
Make Subaru
Model Outback
Serial No.

Site

Compartment:

Name Gasoline Engine
Make
Model
Serial No.
Capacity: 4.5 qt

Customer:
 BRUCE BLACK
 4393 Darrow Rd
 Stow OH 44224
 USA

DIAGNOSIS

Engine wear levels appear satisfactory for first sample. Potassium level (possible coolant chemical) abnormal. Moderate concentration of water present. Silicon level (dirt/sealant material) satisfactory. Unable to obtain accurate viscosity result at 100C due to presence of water in sample.

Action: Check for source of water entry. Check for source of possible coolant leak. Change oil and filter(s) if not already done. Resample at next recommended interval to monitor and establish wear trend.

ANALYST: Eric.Dunlap

LEGEND				
Abnormal	Severe	Abnormal	Caution	Normal

DATE SAMPLED	28-Apr-14
DATE RECEIVED	30-Apr-14
DATE REPORTED	05-May-14

LAB NO.		41020944193
SIF NO.		15391095
TIME ON UNIT	Mi	99800
TIME ON OIL	Mi	10000
OIL BRAND		Amsoil
OIL TYPE		Unidentified
OIL GRADE		SAE 5W30
OIL ADDED	qt	
FILTER	Mi	
OIL CHANGED		
WO NUMBER		

Metals (ppm)

Iron (Fe)	29
Chromium (Cr)	<1
Lead (Pb)	<1
Copper (Cu)	1
Tin (Sn)	<1
Aluminium (Al)	10
Nickel (Ni)	<1
Silver (Ag)	<1
Titanium (Ti)	<1
Vanadium (V)	<1

Contaminants (ppm)

Silicon (Si)	26
Sodium (Na)	150
Potassium (K)	83

Additives (ppm)

Magnesium (Mg)	7
Calcium (Ca)	3416
Barium (Ba)	<1
Phosphorus (P)	752
Zinc (Zn)	798
Molybdenum (Mo)	101
Boron (B)	37

Contaminants

Water (%)	0.71
Coolant	Yes

Physical Tests

PQ Index	<10
Viscosity (cSt 100C)	N/A

Physical / Chemical

Base Number (mgKOH/g)	2.5
Oxidation (Abs) E2412/D7414	N/A



UIN 03BE0FE

U.S. Laboratories

- | | |
|--|---|
| Atlanta, Georgia - 420
3121 Presidential Drive
Atlanta, GA 30340
800.394.3669 | Valley View, Ohio - 410
6180 Halle Dr. Suite D
Valley View, OH 44125
800.726.5400 |
| Kansas City, Kansas - 430
935 Sunshine Road
Kansas City, KS 66115
800.332.8055 | Phoenix, Arizona - 440
3319 West Earll Drive
Phoenix, AZ 85017
800.445.7930 |
| Portland, Oregon - 401
4943 NW Front Avenue
Portland, OR 97210
800.770.4128 | Sparks, Nevada - 400
1375 Greg Street, Suite 104
Sparks, NV 89431
800.524.7848 |

Canadian Laboratories

- Burlington, Ontario - 450**
1240 Burloak Drive, Unit 6
Burlington, ON L7L 6B3
877.732.9559
- Edmonton, Alberta - 402**
10717-176 Street
Edmonton, AB T5S 1K1
888.489.0057

Sales & Marketing

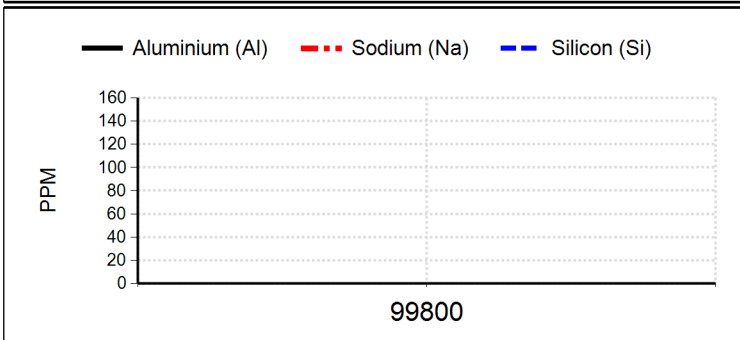
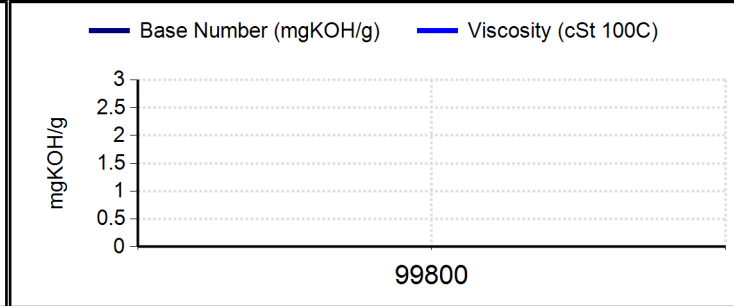
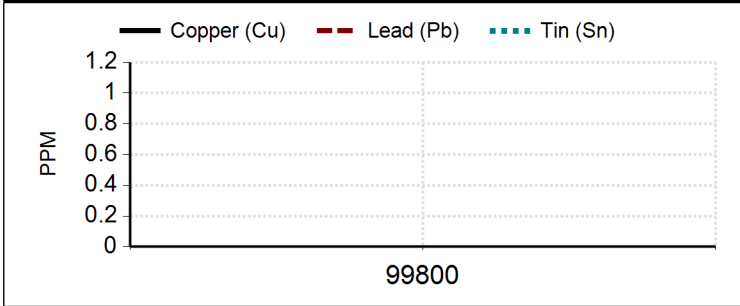
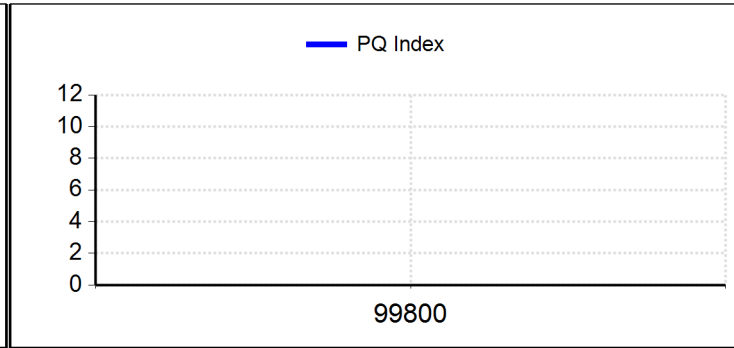
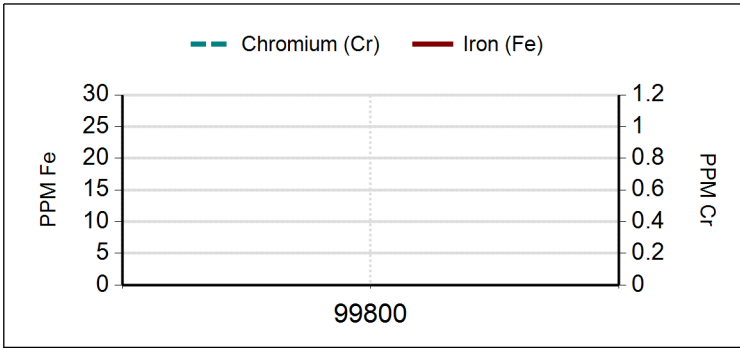
- Houston, Texas**
10450 Stancliff Road, Suite 210
Houston, TX 77099
877.835.8437

International Locations

- | | | |
|---|--|-------------------------|
| Australia
Brisbane, Perth, Sydney, Muswellbrook | South America
Santiago de Chile | |
| New Zealand
Wellington | Southeast Asia
Kuala Lumpur, Singapore | Europe
Prague |

TEST METHODS:

Acid Number:	ASTM D974/D664
Base Number:	ASTM D4739
Base Number (Perchloric):	ASTM D2896
Fuel Dilution by GC:	ASTM D3524
Fuel Dilution Visc/Setaflash	ASTM D445/D7279/D3828
Fuel Soot ATR/IR:	ASTM D7686
Glycol:	ASTM D2982
Metals by Rotrode AES:	ASTM D6595
Metals by ICP AES:	ASTM D5185
Ox, NOx, SOx, FTIR:	ASTM D7418/D7414/D7415 D7624
Particle Count:	ASTM D7647 / ISO 11500, 4406
Viscosity:	ASTM D445 / D7279
Water KF:	ASTM E203 Mod / D6304C
Water Crackle:	In House



Filter Image

Filter patch test is not performed Contact laboratory for more information

Since services are based on samples and information supplied by others, and since corrective actions, if any, are necessarily taken by others, these services are rendered without any warranty or liability of any kind beyond the actual amount paid to ALS Tribology for the services. Reported recommendations are based on interpretations of the generated test results and historical data. Certain test results appearing in this report may have been tested at other ALS laboratories within the Tribology divisional network.

Bruce Black
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