

ANA LABORATORIES, INC.

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MONTREAL, MAINE & ATLANTIC RW
 18 B & A AVE
 DERBY, ME 04463
 ATTN: STEVE JONSTON

Attn: STEVE JONSTON
 Phone: 207/943-7327

YOUR COMPUTER NAME
 YOUR COMPUTER UNIT I.D.

U Type
 I Make
 T Model
 N Sump capacity
 F Type of operation
 O Oil Type

JGMMADME
 5026
 RAIL

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O

LAB NO. R07J009588
 CUSTOMER SAMPLE PROCESSING DATE 09/01/07 09/17/07
 HOURS/MILES 500000 M 10000 M 20 G N Y ?
 OIL ADDED OIL DRAINED FILTER CHANGED
 TEST TYPE BI

K V
 4 <1 112 23 6523 <1 6
 Oil Additives: Molybdenum Magnesium Calcium Barium Phosphorus Zinc

ELEMENTAL ANALYSIS VALUES IN PPM BY WEIGHT

Severity Code	1	2	3	4	5
Titanium	<1	<1	<1	<1	<1
Silver	<1	<1	<1	<1	<1
Copper	1	2	<1	<1	<1
Lead	2	<1	<1	<1	<1
Th	<1	<1	<1	<1	<1
Aluminum	4	<1	<1	<1	<1
Nickel	<1	<1	<1	<1	<1
Iron	11	<1	<1	<1	<1
Chromium	<1	<1	<1	<1	<1
Cp	<1	4	2	2	2
Sodium (ppm)	<1	4	2	2	2
Boron (ppm)	<1	4	2	2	2
Silicon (ppm)	<1	4	2	2	2
Water % by Vol.	<1	4	2	2	2
% Soot	0.70	<0.5	<0.5	<0.5	<0.5
Glycol	N	<0.5	<0.5	<0.5	<0.5
SAE/ISO Fuel Grade	13.40	<0.5	<0.5	<0.5	<0.5
TBN mg/g	13.40	<0.5	<0.5	<0.5	<0.5
Vis. @ 100 C. Cst.	15.24	<0.5	<0.5	<0.5	<0.5

1. NO CORRECTIVE ACTION NEEDED!
 2. REMARKS
 3. REMARKS
 4. REMARKS
 5. REMARKS

NE = Value not found in ANA LABS database

Since services are based on samples and information supplied by others, and since corrective action, if any, is necessarily taken by others, these services are rendered without any warranty or liability.

SEE REVERSE SIDE FOR ADDITIONAL RECOMMENDATIONS AND COMMENTS

THE FOLLOWING INFORMATION HAS BEEN PROVIDED TO ASSIST IN THE INTERPRETATION OF YOUR OIL ANALYSIS.

WEAR METALS

These metals indicate wear on particular components of an individual unit. The particles of these metals will indicate a wear problem on the microscopic level before the problem can be detected by conventional means. The existence of a wear problem is determined not only by absolute values of metals, but more importantly by a relative increase or trend in one or more of these metals.

WEAR METAL SOURCES

- IronCylinders, Gears, Rings, Crankshafts, Liners, Bearings, Housings, Rust.
- ChromiumRings, Roller/Taper Bearing, Rods, Platings.
- LeadBearing Overlays, additive in gear oil and gasoline.
- CopperBushings, Bearings, Thrust-Washers, Friction Plates, oil Cooler, additive in oil.
- TinBearings, Bushings, Pistons' Platings.
- AluminumPistons, Bearings, Pumps, Blowers, Rotors, Thrust-Washers.
- Nickel.....Valves.
- Silver.....Bearings, Bushings, Platings.
- ManganeseTrace elements in liners and rings, additive in gasoline.
- Titanium.....Trace element.
- VanadiumTrace element.

CONTAMINANTS

These elements can be an indicator of both internal and external contamination. The source and amount of contamination can be determined by comparison to a previously normal sample or to a new oil reference. Specific tests for some contaminants can supplement the analysis.

CONTAMINANT SOURCES

- SiliconElement used to determine the level of airborne dirt and abrasives in the oil (sometimes used as an anti-foam agent).
- BoronPresent in most permanent anti-freeze systems and cooling system inhibitors (sometimes used as an additive).
- SodiumPresent in most permanent anti-freeze systems and cooling system inhibitors (sometimes used as an additive).
- PotassiumPresent in most permanent anti-freeze systems and cooling system inhibitors (sometimes used as an additive in gear oil).

WATER

Reports percent water and percent insolubles (ASTM D-91).

GLYCOL

A specific test for the presence of Glycol (Antifreeze) in an oil (ASTM D-2982).

ADDITIVES

These elements are blended into the oil in different forms and quantities by the manufacturer. The additive package in an oil will vary depending on the type of oil.

ADDITIVE FUNCTIONS

- MagnesiumDispersant/Detergent additive.
- CalciumDispersant/Detergent additive.
- BariumDispersant/Detergent additive.
- PhosphorusAnti-Wear additive.
- ZincAnti-Wear additive.
- MolybdenumAnti-Wear additive.

FUEL DILUTION

Unburned fuel in the oil may signal fuel system leaks or incomplete combustion.

FUEL SOOT

A result of incomplete combustion, blow-by. High levels may indicate combustion problems or overextended drain intervals.

VISCOSITY

The kinematic viscosity (ASTM D-445) determined at 40° C and/or 100° C is a measure of the flow rate of an oil in relation to time. This data is used to assign an SAE grade to an oil.

ENGINE OIL VISCOSITY CLASSIFICATION CHART

SAE GRADE	MIN-cSt-100° C	MAX-cSt
10W	4.10	
20	5.60	9.29
30	9.30	12.49
40	12.50	16.29
50	16.30	21.89

SEVERITY CODE CONDITIONS

- 5 (C) **EXCESSIVE/UNACCEPTABLE** Must take corrective action before further use. Contact lab to discuss.
- 4 **MODERATELY HIGH** Monitor closely or take corrective action. Send half interval recheck to monitor rate of increase and determine seriousness of abnormality.
- 3 (A) **MILD/ACCEPTABLE** Monitor by sending recheck sample as requested so that the rate of increase may be monitored for its seriousness.
- 2 **MODERATE** Lab will monitor. Follow normal operation and sampling. The sample Normal/Acceptable shows minor trend change since last report.
- 1 (N) **SATISFACTORY** Lab will monitor. Follow normal operation and sampling.

ADDITIONAL TESTS

- CLChlorine
- IRInfrared Spectrophotometric Analysis
- TBNTotal Base Number (ASTM D-4739)
- TANTotal Acid Number (ASTM D-664)
- PCParticle Count
- VIViscosity Index (ASTM D-2270)
- pHpH Range
- POURPTPour Point (ASTM D-97)
- SUGARSugar in Lubricating Oils
- SULFURSulfur Determination (ASTM D-4294 or D-1552)

**COMPLETE COOLANT & FUEL TESTING AVAILABLE
CALL LAB FOR COMPLETE LISTING**