



# OIL ANALYSIS REPORT

|                 |                 |
|-----------------|-----------------|
| WEAR            | <b>ABNORMAL</b> |
| CONTAMINATION   | <b>NORMAL</b>   |
| FLUID CONDITION | <b>NORMAL</b>   |



Machine Id  
**VOLVO 118518**  
Component  
**Front Diesel Engine**  
Fluid  
**CHEVRON DELO 400 MULTIGRADE 15W40 (40 QTS)**

## RECOMMENDATION

No corrective action is recommended at this time. Resample at the next service interval to monitor.

| Test           | UOM | Method      | Limit/Abn | Current            | History1    | History2    |
|----------------|-----|-------------|-----------|--------------------|-------------|-------------|
| Sample Number  |     | Client Info |           | <b>KLMFA23697</b>  | KLMFA23922  | KLMFA07587  |
| Sample Date    |     | Client Info |           | <b>17 Apr 2017</b> | 09 Jan 2017 | 13 Jul 2013 |
| Machine Age    | mls | Client Info |           | <b>0</b>           | 585169      | 509165      |
| Oil Age        | mls | Client Info |           | <b>64864</b>       | 34056       | 121723      |
| Filter Age     | mls | Client Info |           | <b>0</b>           | 34056       | 121723      |
| Oil Changed    |     | Client Info |           | <b>N/A</b>         | Not Changd  | Not Changd  |
| Filter Changed |     | Client Info |           | <b>Not Changd</b>  | Not Changd  | Not Changd  |
| Sample Status  |     |             |           | <b>ABNORMAL</b>    | ABNORMAL    | NORMAL      |

## WEAR

Valve wear is indicated. All other component wear rates are normal.

|              |        |             |      |              |             |      |
|--------------|--------|-------------|------|--------------|-------------|------|
| Iron         | ppm    | ASTM D5185m | >100 | <b>121</b>   | 37          | 247  |
| Chromium     | ppm    | ASTM D5185m | >20  | <b>2</b>     | 1           | 6    |
| Nickel       | ppm    | ASTM D5185m | >2   | <b>▲ 12</b>  | <b>▲ 10</b> | 5    |
| Titanium     | ppm    | ASTM D5185m |      | <b>&lt;1</b> | 0           | <1   |
| Silver       | ppm    | ASTM D5185m | >2   | <b>0</b>     | 0           | 0    |
| Aluminum     | ppm    | ASTM D5185m | >25  | <b>13</b>    | 7           | 22   |
| Lead         | ppm    | ASTM D5185m | >40  | <b>3</b>     | 2           | 43   |
| Copper       | ppm    | ASTM D5185m | >330 | <b>93</b>    | 45          | 94   |
| Tin          | ppm    | ASTM D5185m | >15  | <b>&lt;1</b> | 2           | 4    |
| Vanadium     | ppm    | ASTM D5185m |      | <b>0</b>     | 0           | <1   |
| White Metal  | scalar | *Visual     | NONE | <b>NONE</b>  | NONE        | NONE |
| Yellow Metal | scalar | *Visual     | NONE | <b>NONE</b>  | NONE        | NONE |

## CONTAMINATION

There is no indication of any contamination in the component.

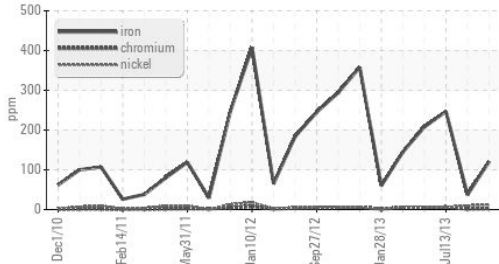
|                  |          |             |       |                |       |       |
|------------------|----------|-------------|-------|----------------|-------|-------|
| Silicon          | ppm      | ASTM D5185m | >25   | <b>10</b>      | 13    | 11    |
| Potassium        | ppm      | ASTM D5185m | >20   | <b>0</b>       | 3     | 7     |
| Fuel             |          | WC Method   | >6.0  | <b>&lt;1.0</b> | <1.0  | <1.0  |
| Water            | %        | ASTM D6304  | >0.2  | <b>NEG</b>     | NEG   | NEG   |
| Glycol           |          | WC Method   |       | <b>NEG</b>     | NEG   | NEG   |
| Soot %           | %        | *ASTM D7844 | >3    | <b>1.5</b>     | 0.5   | 1.1   |
| Nitration        | Abs/cm   | *ASTM D7624 |       | <b>8.</b>      | 11.   | 10.   |
| Sulfation        | Abs/.1mm | *ASTM D7415 |       | <b>21.</b>     | 27.   | 25.   |
| Silt             | scalar   | *Visual     | NONE  | <b>NONE</b>    | NONE  | NONE  |
| Debris           | scalar   | *Visual     | NONE  | <b>NONE</b>    | NONE  | NONE  |
| Sand/Dirt        | scalar   | *Visual     | NONE  | <b>NONE</b>    | NONE  | NONE  |
| Appearance       | scalar   | *Visual     | NORML | <b>NORML</b>   | NORML | NORML |
| Odor             | scalar   | *Visual     | NORML | <b>NORML</b>   | NORML | NORML |
| Emulsified Water | scalar   | *Visual     | >0.2  | <b>NEG</b>     | NEG   | NEG   |

## FLUID CONDITION

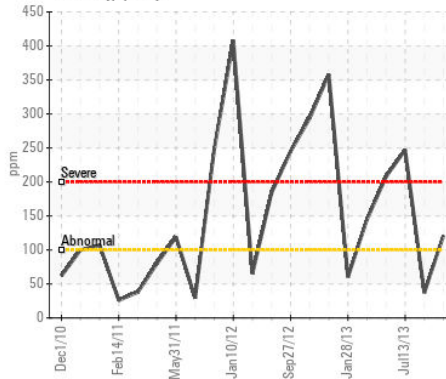
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

|                  |          |             |      |              |       |       |
|------------------|----------|-------------|------|--------------|-------|-------|
| Sodium           | ppm      | ASTM D5185m |      | <b>14</b>    | 6     | 15    |
| Boron            | ppm      | ASTM D5185m | 151  | <b>35</b>    | 91    | 55    |
| Barium           | ppm      | ASTM D5185m | 0.4  | <b>0</b>     | <1    | 0     |
| Molybdenum       | ppm      | ASTM D5185m | 250  | <b>75</b>    | 83    | 76    |
| Manganese        | ppm      | ASTM D5185m |      | <b>2</b>     | 1     | 5     |
| Magnesium        | ppm      | ASTM D5185m | 0    | <b>354</b>   | 397   | 287   |
| Calcium          | ppm      | ASTM D5185m | 2046 | <b>1468</b>  | 1604  | 1698  |
| Phosphorus       | ppm      | ASTM D5185m | 1043 | <b>879</b>   | 1004  | 993   |
| Zinc             | ppm      | ASTM D5185m | 943  | <b>1056</b>  | 1108  | 1219  |
| Sulfur           | ppm      | ASTM D5185m | 5012 | <b>2637</b>  | 2205  | 3333  |
| Oxidation        | Abs/.1mm | *ASTM D7414 |      | <b>18.</b>   | 26.   | 25.   |
| Base Number (BN) | mg KOH/g | ASTM D2896  | 12.5 | <b>6.60</b>  | 5.70  | 7.2   |
| Visc @ 100°C     | cSt      | ASTM D445   | 14.4 | <b>14.41</b> | 13.28 | 15.55 |

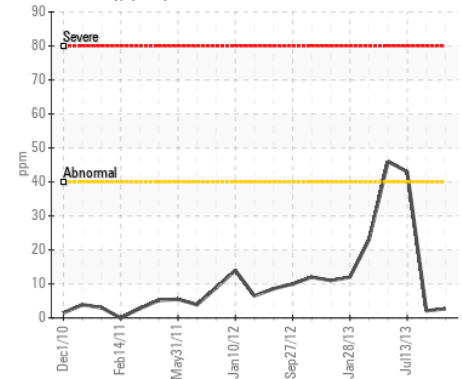
▲ Ferrous Alloys



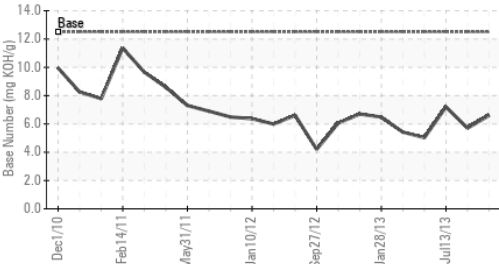
Iron (ppm)



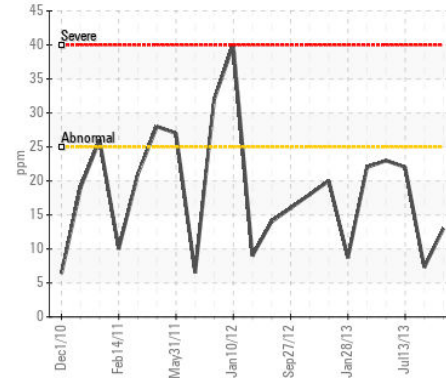
Lead (ppm)



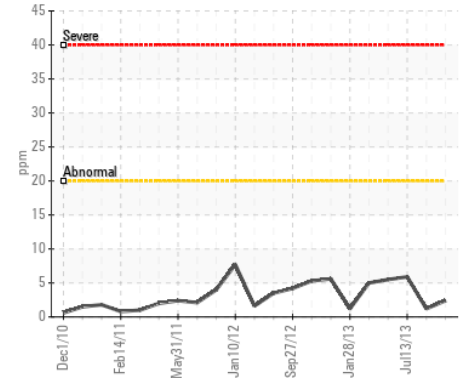
Base Number



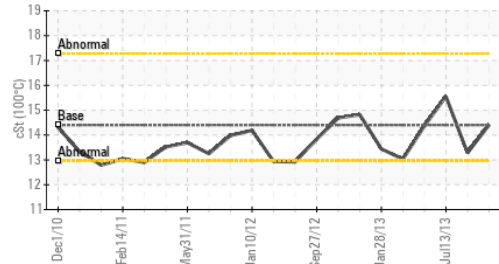
Aluminum (ppm)



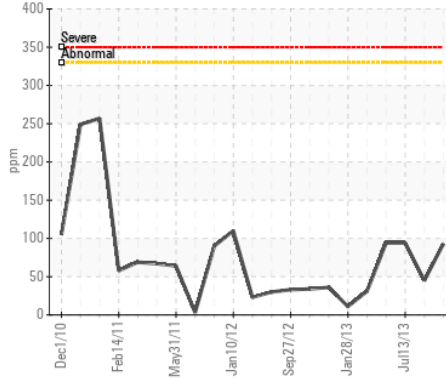
Chromium (ppm)



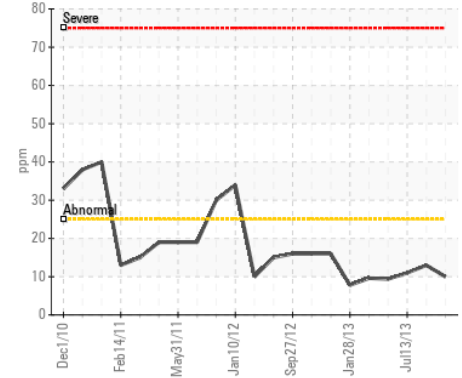
Viscosity @ 100°C



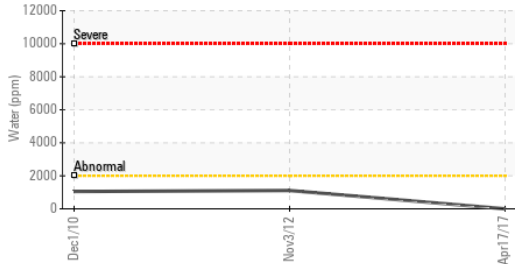
Copper (ppm)



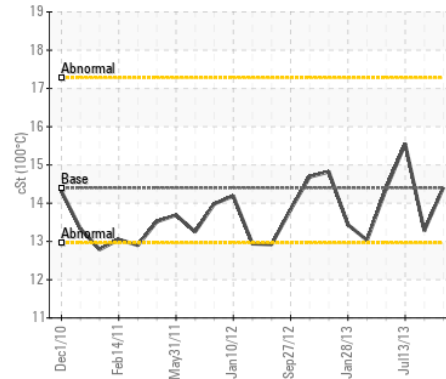
Silicon (ppm)



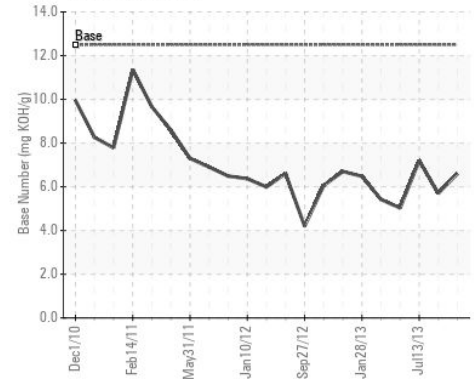
Water (KF)



Viscosity @ 100°C



Base Number



Certificate L2367

**Laboratory** : WearCheck USA - 501 Madison Ave., Cary, NC 27513  
**Sample No.** : KLMFA23697 **Received** : 09 May 2017  
**Lab Number** : 04218590 **Diagnosed** : 11 May 2017  
**Unique Number** : 7792018 **Diagnostician** : Don Baldrige  
**Test Package** : MOB 2 ( Additional Tests: KF, PQ )

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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)