

OIL ANALYSIS REPORT

Sample Rating Trend

NORMAL

INTERNATIONAL 5919028 Component

Diesel Engine

VALVOLINE 15W40 (--- GAL)

Recommendation

Resample at the next service interval to monitor.

Wear

All component wear rates are normal.

Contamination

There is no indication of any contamination in the oil.

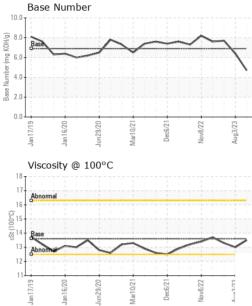
Fluid Condition

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

| mt2019 Jant2020 Jant2020 Mar2021 Dec2021 New2002 Aug2023 | | | | | | | | | |
|---|---|---|---|---|---|---|--|--|--|
| SAMPLE INFORM | IATION | method | limit/base | current | history1 | history2 | | | |
| Sample Number | | Client Info | | IL0033226 | IL05934658 | IL05853004 | | | |
| Sample Date | | Client Info | | 31 Oct 2023 | 03 Aug 2023 | 08 May 2023 | | | |
| Machine Age | mls | Client Info | | 0 | 294816 | 283352 | | | |
| Oil Age | mls | Client Info | | 308371 | 0 | 0 | | | |
| Oil Changed | | Client Info | | Changed | N/A | N/A | | | |
| Sample Status | | | | NORMAL | ABNORMAL | ABNORMAL | | | |
| CONTAMINATION | I | method | limit/base | current | history1 | history2 | | | |
| Fuel | | WC Method | >5 | <1.0 | <1.0 | <1.0 | | | |
| Water | | WC Method | >0.2 | NEG | NEG | NEG | | | |
| Glycol | | WC Method | | NEG | NEG | NEG | | | |
| WEAR METALS | | method | limit/base | current | history1 | history2 | | | |
| Iron | ppm | ASTM D5185m | >100 | 4 | 15 | 12 | | | |
| Chromium | ppm | ASTM D5185m | >20 | <1 | 0 | <1 | | | |
| Nickel | ppm | ASTM D5185m | >4 | 0 | 0 | <1 | | | |
| Titanium | ppm | ASTM D5185m | | <1 | <1 | <1 | | | |
| Silver | ppm | ASTM D5185m | >3 | 0 | 0 | 0 | | | |
| Aluminum | ppm | ASTM D5185m | >20 | 2 | 2 | 3 | | | |
| Lead | ppm | ASTM D5185m | >40 | 0 | 0 | 0 | | | |
| Copper | ppm | ASTM D5185m | >330 | <1 | <1 | 0 | | | |
| Tin | ppm | ASTM D5185m | >15 | <1 | 0 | <1 | | | |
| Vanadium | ppm | ASTM D5185m | | <1 | <1 | <1 | | | |
| Cadmium | ppm | ASTM D5185m | | 0 | 0 | 0 | | | |
| ADDITIVES | | method | limit/base | current | history1 | history2 | | | |
| Boron | ppm | ASTM D5185m | 39 | 6 | 175 | 74 | | | |
| Barium | ppm | ASTM D5185m | 1 | 0 | 0 | 0 | | | |
| Molybdenum | ppm | ASTM D5185m | 49 | 59 | 88 | 67 | | | |
| Manganese | ppm | ASTM D5185m | 1 | <1 | <1 | <1 | | | |
| Magnesium | ppm | ASTM D5185m | 616 | 904 | 559 | 792 | | | |
| Calcium | ppm | ASTM D5185m | 1554 | 1010 | | | | | |
| | | | 1004 | 1049 | 1491 | 1322 | | | |
| Phosphorus | ppm | ASTM D5185m | 899 | 1049 1017 | 1491 990 | 1322 850 | | | |
| | ppm ppm | | | | | | | | |
| Zinc | | ASTM D5185m | 899 | 1017 | 990 | 850 | | | |
| Zinc | ppm | ASTM D5185m ASTM D5185m | 899 1069 | 1017 1215 | 990 1241 | 850 1075 | | | |
| Zinc Sulfur CONTAMINANTS | ppm | ASTM D5185m ASTM D5185m ASTM D5185m | 899 1069 2624 | 1017 1215 3040 | 990 1241 3625 | 850 1075 3224 | | | |
| Zinc Sulfur CONTAMINANTS Silicon | ppm ppm | ASTM D5185m ASTM D5185m ASTM D5185m method | 899 1069 2624 limit/base | 1017 1215 3040 current | 990 1241 3625 history1 | 850 1075 3224 history2 | | | |
| CONTAMINANTS Silicon | ppm ppm | ASTM D5185m ASTM D5185m ASTM D5185m method ASTM D5185m | 899 1069 2624 limit/base | 1017 1215 3040 current 3 | 990 1241 3625 history1 5 | 850 1075 3224 history2 6 | | | |
| Zinc Sulfur CONTAMINANTS Silicon Sodium | ppm ppm ppm ppm | ASTM D5185m ASTM D5185m ASTM D5185m Method ASTM D5185m ASTM D5185m | 899 1069 2624 limit/base >25 | 1017 1215 3040 current 3 2 | 990 1241 3625 history1 5 23 | 850 1075 3224 history2 6 23 | | | |
| Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED | ppm ppm ppm ppm | ASTM D5185m ASTM D5185m ASTM D5185m method ASTM D5185m ASTM D5185m ASTM D5185m | 899 1069 2624 limit/base >25 >20 | 1017 1215 3040 current 3 2 2 | 990 1241 3625 history1 5 23 ▲ 96 | 850 1075 3224 history2 6 23 ▲ 81 | | | |
| Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED Soot % | ppm ppm ppm ppm ppm | ASTM D5185m ASTM D5185m ASTM D5185m Method ASTM D5185m ASTM D5185m ASTM D5185m | 899 1069 2624 limit/base >25 >20 limit/base | 1017 1215 3040 current 3 2 2 2 2 current | 990 1241 3625 history1 5 23 ▲ 96 history1 | 850 1075 3224 history2 6 23 ▲ 81 history2 | | | |
| Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED | ppm | ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m method *ASTM D7844 | 899 1069 2624 <i>limit/base</i> >25 >20 <i>limit/base</i> >3 | 1017 1215 3040 current 3 2 2 2 current 0.6 | 990 1241 3625 history1 5 23 ▲ 96 history1 0.2 | 850 1075 3224 history2 6 23 ▲ 81 history2 0.2 | | | |
| Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED Soot % Nitration | ppm ppm ppm ppm ppm ppm v v v Abs/.1mm | ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m method *ASTM D7844 *ASTM D7624 | 899 1069 2624 imit/base >25 >20 imit/base >3 >20 | 1017 1215 3040 current 3 2 2 2 current 0.6 12.5 | 990 1241 3625 history1 5 23 ▲ 96 history1 0.2 9.3 | 850 1075 3224 history2 6 23 ▲ 81 history2 0.2 10.1 | | | |
| Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation | ppm ppm ppm ppm ppm ppm v v v Abs/.1mm | ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m *ASTM D7844 *ASTM D7844 *ASTM D7415 | 899 1069 2624 imit/base >25 >20 imit/base >3 >20 >3 >20 | 1017 1215 3040 current 3 2 2 2 current 0.6 12.5 26.1 | 990 1241 3625 history1 5 23 23 96 <u>history1</u> 0.2 9.3 22.0 | 850 1075 3224 history2 6 23 ▲ 81 history2 0.2 10.1 21.7 | | | |



OIL ANALYSIS REPORT



| VISUAL White Metal Yellow Metal Precipitate Silt Debris Sand/Dirt Appearance Odor Emulsified Water Free Water Free Water Visc @ 100°C GRAPHS | scalar scalar scalar scalar scalar scalar scalar scalar scalar | method *Visual | limit/base NONE NONE NONE NONE NONE NONE NORML | Current NONE NONE NONE NONE NONE NONE NORE | history1 NONE NONE NONE NONE NONE NONE NORML | history2 NONE NONE NONE NONE NONE |
|---|--|--|--|---|---|--|
| Yellow Metal Precipitate Silt Debris Sand/Dirt Appearance Odor Emulsified Water Free Water Free Water Visc @ 100°C | scalar scalar scalar scalar scalar scalar scalar scalar scalar | *Visual *Visual *Visual *Visual *Visual *Visual *Visual | NONE NONE NONE NONE NORML | NONE NONE NONE NONE | NONE NONE NONE NONE | NONE NONE NONE NONE |
| Precipitate Silt Debris Sand/Dirt Appearance Odor Emulsified Water Free Water Free Water FLUID PROPERT Visc @ 100°C | scalar scalar scalar scalar scalar scalar scalar scalar | *Visual *Visual *Visual *Visual *Visual *Visual | NONE NONE NONE NORML NORML | NONE NONE NONE NONE | NONE NONE NONE | NONE NONE NONE |
| Silt Debris Sand/Dirt Appearance Odor Emulsified Water Free Water FLUID PROPERT Visc @ 100°C | scalar scalar scalar scalar scalar scalar scalar | *Visual *Visual *Visual *Visual *Visual | NONE NONE NORML NORML | NONE NONE NONE | NONE NONE NONE | NONE NONE NONE |
| Debris Sand/Dirt Appearance Odor Emulsified Water Free Water FLUID PROPERT Visc @ 100°C | scalar scalar scalar scalar scalar scalar | *Visual *Visual *Visual *Visual *Visual | NONE NONE NORML NORML | NONE NONE | NONE NONE | NONE NONE |
| Sand/Dirt Appearance Odor Emulsified Water Free Water FLUID PROPERT Visc @ 100°C | scalar scalar scalar scalar scalar | *Visual *Visual *Visual *Visual | NONE NORML NORML | NONE | NONE | NONE |
| Appearance Odor Emulsified Water Free Water FLUID PROPERT Visc @ 100°C | scalar scalar scalar scalar | *Visual *Visual *Visual | NORML NORML | | | |
| Odor Emulsified Water Free Water FLUID PROPERT Visc @ 100°C | scalar scalar scalar | *Visual *Visual | NORML | NORML | NORML | |
| Emulsified Water Free Water FLUID PROPERT Visc @ 100°C | scalar scalar | *Visual | | | | NORML |
| Free Water FLUID PROPERT Visc @ 100°C | scalar | | | NORML | NORML | NORML |
| FLUID PROPERT Visc @ 100°C | | *Visual | >0.2 | NEG | NEG | NEG |
| Visc @ 100°C | IES | Visual | | NEG | NEG | NEG |
| | | method | limit/base | current | history1 | history |
| GRAPHS | cSt | ASTM D445 | 13.6 | 13.5 | 13.0 | 13.3 |
| | | | | | | |
| Ferrous Alloys | | | | | | |
| 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 | Mar10/21 | Dec6/21 | Aug3/23 | | | |
| Non-ferrous Metals | 5 | | | | | |
| 50 copper | | | | | | |
| - 00 | | | | | | |
| 50 - | | | | | | |
| DO <mark>-</mark> - 1 | | | | | | |
| 50 | | | | | | |
| DO | | | | | | |
| 50 | | | | | | |
| | 21 | 22 | 23 | | | |
| Jan 1 7/19 Jan 1 6/20 | Mar10/21 | Dec6/21 Nov8/22 | Aug3/23 | | | |
| Viscosity @ 100°C | _ | | | Base Number | | |
| ¹⁸ T : | | | 9.0 | base Number | | |
| | | | | | | |
| Abnormal | | | 8.0- (p7.0-)))))))))))))))))))))))))))))))))))) | | \sim | ~ |

4.0 3.0

ase 2.0

1.0

Jan 17/19

Jan 16/20



 Certificate L2367
 Test Package
 : FLEET

 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)

un29/20

Dec6/21.

: WearCheck USA - 501 Madison Ave., Cary, NC 27513

Received

Diagnosed

Mar10/21

Nov8/22 -

Diagnostician : Sean Felton

Aug3/23 -

: 20 Nov 2023

: 21 Nov 2023

cSt (

Unique Number : 10751050

Laboratory

Sample No.

Lab Number

13

12

Jan 17/19

: IL0033226

: 06011906

Jan 16/20

Nov8/22

Vug3/23

Mar10/21.

Dec6/21