



# OIL REPORT

LAB NUMBER:  
REPORT DATE: 3/14/2019  
CODE: 20/1,199

UNIT ID:  
PAYMENT: Bulk CC

|             |   |  |
|-------------|---|--|
| <b>UNIT</b> | MAKE/MODEL: Detroit DD15                    | OIL TYPE & GRADE: Shell Rotella T6 5W/40 |
|             | FUEL TYPE: Diesel                           | OIL USE INTERVAL: 25,863 Miles           |
|             | ADDITIONAL INFO: 2011 Freightliner Cascadia |  |

|               |  |
|---------------|--|
| <b>CLIENT</b> |  |
|---------------|--|

**COMMENTS** We filled in miles on the oil based on engine mileage, but let us know if that's wrong. Wear metals are impressively low once again for unit 1270. Of course, this engine is no stranger to excellent oil analysis results, but we're always happy to issue a perfect report. Soot read at just 0.5% this time (down from 0.9% in previous samples). No fuel or coolant showed up and the viscosity is in the 5W/40 range. Low insolubles and silicon indicate excellent oil and air filtration. You clearly have a good handle on this engine. Just keep doing what you're doing.

| ELEMENTS IN PARTS PER MILLION | MI/HR on Oil      | 25,863    | UNIT / LOCATION AVERAGES | 18,458     | 26,425    | 38,662    | 25,089     | 17,209   | UNIVERSAL AVERAGES |
|-------------------------------|-------------------|-----------|--------------------------|------------|-----------|-----------|------------|----------|--------------------|
|                               | MI/HR on Unit     | 707,936   |                          | 682,073    | 663,675   | 637,210   | 598,548    | 573,459  |                    |
|                               | Sample Date       | 3/13/2019 |                          | 10/30/2018 | 8/13/2018 | 4/24/2018 | 10/21/2017 | 6/7/2017 |                    |
|                               | Make Up Oil Added | 1 gal     |                          | 0 qts      | 0 qts     | 0 qts     | 4 qts      | 0 qts    |                    |
|                               | ALUMINUM          | 4         | 5                        | 3          | 5         | 6         | 5          | 5        | 8                  |
|                               | CHROMIUM          | 1         | 1                        | 1          | 1         | 1         | 1          | 1        | 2                  |
|                               | IRON              | 11        | 17                       | 11         | 18        | 17        | 15         | 11       | 23                 |
|                               | COPPER            | 2         | 35                       | 1          | 2         | 3         | 3          | 3        | 13                 |
|                               | LEAD              | 0         | 0                        | 0          | 0         | 0         | 0          | 0        | 0                  |
|                               | TIN               | 0         | 0                        | 0          | 0         | 0         | 0          | 0        | 0                  |
|                               | MOLYBDENUM        | 2         | 18                       | 1          | 1         | 2         | 15         | 66       | 38                 |
|                               | NICKEL            | 0         | 0                        | 0          | 0         | 0         | 0          | 0        | 1                  |
|                               | MANGANESE         | 0         | 0                        | 0          | 0         | 0         | 0          | 0        | 0                  |
|                               | SILVER            | 0         | 0                        | 0          | 0         | 0         | 0          | 0        | 0                  |
|                               | TITANIUM          | 1         | 1                        | 1          | 1         | 1         | 1          | 0        | 2                  |
|                               | POTASSIUM         | 2         | 2                        | 3          | 4         | 4         | 1          | 0        | 8                  |
|                               | BORON             | 88        | 40                       | 95         | 41        | 64        | 38         | 25       | 46                 |
|                               | SILICON           | 3         | 3                        | 3          | 4         | 3         | 3          | 3        | 6                  |
|                               | SODIUM            | 5         | 6                        | 5          | 4         | 6         | 4          | 6        | 7                  |
|                               | CALCIUM           | 2246      | 1823                     | 2001       | 1947      | 2153      | 1658       | 846      | 1699               |
|                               | MAGNESIUM         | 96        | 351                      | 74         | 84        | 88        | 317        | 1158     | 552                |
|                               | PHOSPHORUS        | 1063      | 978                      | 963        | 935       | 1026      | 887        | 1061     | 968                |
|                               | ZINC              | 1244      | 1182                     | 1100       | 1095      | 1210      | 1115       | 1247     | 1161               |
|                               | BARIIUM           | 0         | 0                        | 0          | 0         | 0         | 0          | 0        | 0                  |

Values Should Be\*

| PROPERTIES            | 75.1  | 66-78     | 75.4  | 75.8  | 73.4  | 73.0  | 69.0  |
|-----------------------|-------|-----------|-------|-------|-------|-------|-------|
| SUS Viscosity @ 210°  | 75.1  | 66-78     | 75.4  | 75.8  | 73.4  | 73.0  | 69.0  |
| cSt Viscosity @ 100°C | 14.28 | 11.9-15.3 | 14.37 | 14.47 | 13.85 | 13.75 | 12.70 |
| Flashpoint in °F      | 450   | >410      | 435   | 430   | 435   | 440   | 430   |
| Fuel %                | <0.5  | <2.0      | <0.5  | <0.5  | <0.5  | <0.5  | <0.5  |
| Antifreeze %          | 0.0   | 0.0       | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| Water %               | 0.0   | 0.0       | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| Insolubles %          | 0.2   | <0.6      | 0.2   | 0.3   | 0.3   | 0.2   | 0.2   |
| TBN                   |       |           |       |       |       |       |       |
| TAN                   |       |           |       |       |       |       |       |
| ISO Code              |       |           |       |       |       |       |       |

\* THIS COLUMN APPLIES ONLY TO THE CURRENT SAMPLE

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