



# GAS/DIESEL REPORT

LAB NUMBER: D95618  
 REPORT DATE: 7/25/2018  
 CODE: 22/16

UNIT ID: 05 F250  
 CLIENT ID: 20751  
 PAYMENT: CC: Visa

You'll need your client ID if you want to log on to [www.blackstone-labs.net](http://www.blackstone-labs.net) and view your reports.

This is a good place to identify things like bypass filtration, mods, etc.

|      |                    |  |                   |                        |
|------|--------------------|--|-------------------|------------------------|
| UNIT | EQUIP. MAKE/MODEL: | Navistar 6.0L Power Stroke                                 | OIL TYPE & GRADE: | Shell Rotella T 15W/40 |
|      | FUEL TYPE:         | Diesel   | OIL USE INTERVAL: | 4,907 Miles            |
|      | ADDITIONAL INFO:   | This vehicle is the love of my life. I will never sell it. |                   |                        |

|        |                      |            |                     |
|--------|----------------------|------------|---------------------|
| CLIENT | OSCAR HUFF           | PHONE:     | (828) 123-5897      |
|        | OSCAR'S WORKSHOP     | FAX:       | (828) 123-1547      |
|        | 132 PERIWINKLE RD    | ALT PHONE: | (828) 123-1564      |
|        | STE. 102             | EMAIL:     | oscar@bellsouth.com |
|        | SWANNANOVA, NC 18752 |            |                     |

**COMMENTS**  
 OSCAR: The fuel we spoke of last time improved to 0.5% in this sample. Iron took a big step in the right direction, too. All wear now re your engine is free of any obvi  
**Sample report**  
 d in the proper balance to indicate ity is common to the 6.0L but the fuel may have lowered it as well. NO COALIN or moisture was found. Both silicon and insolubles read normally showing good air and oil filtration. At 47,356 total miles your PSD is wearing well. We think you could run the oil a little longer, if you're interested.

The amount of oil you added between oil changes.

| ELEMENTS IN PARTS PER MILLION | MI/HR on Oil  | 4,907    | UNIT / LOCATION AVERAGES | 5,134    | 5,012    | 4,832    | 3,715    | UNIVERSAL AVERAGES |
|-------------------------------|---------------|----------|--------------------------|----------|----------|----------|----------|--------------------|
|                               | MI/HR on Unit | 47,356   |                          | 42,449   | 37,315   | 32,303   | 27,471   |                    |
|                               | Sample Date   | 12/02/15 |                          | 10/08/15 | 07/12/15 | 05/21/15 | 04/16/15 |                    |
|                               | Make Up Oil   | 0 qts    |                          | 0 qts    | 0 qts    | 2 qts    | 5 qts    |                    |
| ALUMINUM                      | 4             | 4        | 4                        | 3        | 4        | 6        | 3        |                    |
| CHROMIUM                      | 2             | 2        | 1                        | 1        | 1        | 2        | 1        |                    |
| IRON                          | 30            | 31       | 44                       | 24       | 23       | 33       | 23       |                    |
| COPPER                        | 2             | 4        | 3                        | 2        | 2        | 3        | 3        |                    |
| LEAD                          | 2             | 3        | 3                        | 4        | 5        | 5        | 3        |                    |
| TIN                           | 0             | 1        | 0                        | 1        | 2        | 2        | 1        |                    |
| MOLYBDENUM                    | 4             | 4        | 5                        | 5        | 4        | 4        | 29       |                    |
| NICKEL                        | 1             | 1        | 1                        | 1        | 0        | 1        | 0        |                    |
| MANGANESE                     | 0             | 0        | 0                        | 0        | 0        | 1        | 0        |                    |
| SILVER                        | 0             | 0        | 0                        | 0        | 0        | 0        | 0        |                    |
| TITANIUM                      | 0             | 0        | 0                        | 0        | 0        | 0        | 0        |                    |
| POTASSIUM                     | 3             | 3        | 2                        | 1        | 2        | 2        | 4        |                    |
| BORON                         | 0             | 2        | 1                        | 2        | 0        | 1        | 32       |                    |
| SILICON                       | 9             | 14       | 11                       | 8        | 9        | 13       | 11       |                    |
| SODIUM                        | 4             | 3        | 3                        | 3        | 3        | 4        | 3        |                    |
| CALCIUM                       | 3430          | 3437     | 3970                     | 3632     | 3525     | 3015     | 3142     |                    |
| MAGNESIUM                     | 10            | 11       | 11                       | 9        | 10       | 11       | 70       |                    |
| PHOSPHORUS                    | 1204          | 1190     | 1289                     | 1274     | 1212     | 1246     | 1116     |                    |
| ZINC                          | 1345          | 1325     | 1508                     | 1381     | 1392     | 1387     | 1279     |                    |
| BARIUM                        | 0             | 0        | 0                        | 0        | 0        | 1        | 2        |                    |

This column shows average wear for all the samples we've seen from this type of engine.

This is the average wear for this particular type of engine for you or your business.

The additives in this column are a mix of all different types of oil, so you can't compare them to your sample.

Values Should Be\*

From left to right, these are your past samples.

The tests in the Properties box look at the physical condition of the oil.

|            |                       |       |           |       |       |       |       |
|------------|-----------------------|-------|-----------|-------|-------|-------|-------|
| PROPERTIES | SUS Viscosity @ 210°F | 65.5  | 69-80     | 65.9  | 65.7  | 63.4  | 60.3  |
|            | cSt Viscosity @ 100°C | 11.74 | 12.7-15.5 | 11.85 | 11.79 | 11.16 | 10.29 |
|            | Flashpoint in °F      | 405   | >410      | 390   | 430   | 390   | 400   |
|            | Fuel %                | 0.5   | <2.0      | 2.0   | <0.5  | <0.5  | 1.0   |
|            | Antifreeze %          | 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   |
|            | Insolubles %          | 0.3   | <0.6      | 0.3   | 0.2   | 0.3   | 0.3   |
|            | TBN                   | 6.3   |           | 8.4   | 9.5   | 6.6   | 12.5  |
|            | TAN                   |       |           |       |       |       |       |
|            | ISO Code              |       |           |       |       |       |       |

\* THIS COLUMN APPLIES ONLY TO THE CURRENT SAMPLE

416 E. PETTIT AVE. FORT WAYNE, IN 46806 (260) 744-2380 [www.blackstone-labs.com](http://www.blackstone-labs.com)



## Gas/Diesel Engine Report Explanation

**Averages:** Both the universal and unit averages are running averages and change with the number of samples we analyze.

**Elements:** Elements are quantified in the oil at parts per million levels (PPM). This list shows the most common sources of the elements in gasoline or diesel engine oil. Following each element is a description of where it comes from. They are grouped by category.

### Wear Metals

**Aluminum:** Pistons, bearings. Clutch assembly and transmission components in motorcycles

**Chromium:** Rings, a trace element in steel

**Iron:** Cylinders, rotating shafts, the valve train, and any steel part sharing the oil. Transmission shafts/gears and bearings in motorcycles

**Copper:** Brass or bronze parts, copper bushings, bearings, oil coolers

**Lead:** Bearings, leaded gas, fuel additives

**Tin:** Bearings, bronze parts, piston coating (rare)

**Nickel:** Trace element in steel, platings on some cylinder types

**Silver:** Bearings

**Titanium:** Some intake valves and connecting rods, aftermarket parts, oil additive

### Contaminants

**Potassium:** Antifreeze, additive in some oil types

**Sodium:** Antifreeze (ethylene glycol), additive in some gasoline engine oils. Sea water in marine engines

**Silicon:** Airborne dirt escaping air filtration, sealers, gaskets, sand-casted parts, and spray lubricants, antifreeze inhibitor, oil additive

### Additives

**Molybdenum:** Anti-wear additive, some types of rings

**Manganese:** Trace element, additive in some gasoline

**Boron:** Anti-wear/anti-rust additive, antifreeze inhibitor

**Calcium:** Detergent/dispersant additive

**Magnesium:** Detergent/dispersant additive

**Phosphorus:** Anti-wear additive

**Zinc:** Anti-wear additive

**Barium:** Detergent/dispersant additive used in some synthetics

### Physical properties

**Viscosity/Flashpoint:** If fuel is present in the oil, the Viscosity and Flashpoint will often be lower than stated in the "Values Should Be" line. A high viscosity may show oil oxidation or high levels of soot. It can also show an oil additive in use.

**Fuel %:** Indicates the amount of volatile fuel dilution found in the oil.

**Antifreeze %:** Indicates the amount of antifreeze found in the oil. A question mark means we found possible traces of coolant, but not enough to definitively say it's there.

**Water %:** Indicates the amount of water found in the oil.

**Insolubles %:** Insolubles are solid materials present in the oil. They are typically free carbon

from the oxidation of the oil itself, along with blow-by past the rings.

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