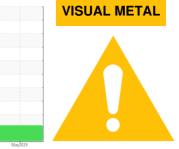


OIL ANALYSIS REPORT

Sample Rating Trend





51 Component Diesel Engine Fluid

PETRO CANADA DURON HP 15W40 (--- GAL)

DIAGNOSIS

A Recommendation

Oil and filter change at the time of sampling has been noted. Resample at the next service interval to monitor.

Machine Id

📥 Wear

Moderate concentration of visible metal present. All component wear rates are normal.

Contamination

There is no indication of any contamination in the oil.

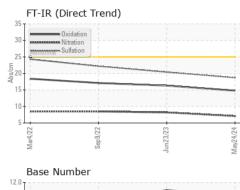
Fluid Condition

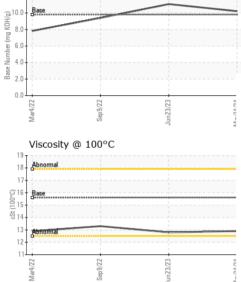
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

| Sample Date Client Info 24 May 2024 23 Jun 2023 09 Sep 2022 Machine Age hrs Client Info 4668 4265 3815 Dil Age hrs Client Info 403 0 0 Dil Changed Client Info Changed Changed Changed NORMAL NORMAL Sample Status Imit/base current history1 history2 Fuel WC Method >5 <1.0 <1.0 <1.0 Water WC Method >0.2 NEG NEG NEG Wethod WC Method >0 24 38 44 Chornium ppm ASTM D5185m >20 <1 <1 <1 Nickel ppm ASTM D5185m >20 0 0 <1 <1 Nickel ppm ASTM D5185m >2 0 0 <1 1 <1 <1 <1 <1 <1 <1 <1 1 <1 <1 | Sample Date Cilent Info 24 May 2024 23 Jun 2023 09 Sep 2022 Machine Age hrs Cilent Info 4668 4265 3815 Oil Age hrs Cilent Info 403 0 0 0 Oil Changed Client Info Changed NEG NEG NEG NEG NEG NEG NEG NEG Changed Changed Changed Changed Changed Changed Changed < | SAMPLE INFORM | IATION | method | limit/base | current | history1 | history2 |
|--|---|---|--|--|--|---|--|---|
| Sample Date Image Client Info 24 May 2024 23 Jun 2023 09 Sep 2022 Machine Age hrs Client Info 4668 4265 3815 Dil Age hrs Client Info 403 0 0 Dil Changed Client Info Changed Changed Changed NORMAL Sample Status Imit/base current history1 history2 Fuel WC Method >5 <1.0 <1.0 <1.0 Water WC Method >0.2 NEG NEG NEG Wethod WC Method >0.2 NEG NEG NEG Wethod word NEG NEG NEG NEG Wethod PD ASTM D5185m >20 <1 <1 <1 Nickel ppm ASTM D5185m >2 0 0 <1 Nickel ppm ASTM D5185m >2 0 0 <1 Nickel ppm ASTM D5185m> | Sample Date Image Client Info 24 May 2024 23 Jun 2023 09 Sep 2022 Machine Age hrs Client Info 4068 4265 3815 Oil Age hrs Client Info 403 0 0 Oil Changed Client Info 4080 NORMAL NORMAL NORMAL CONTAMINATION method Jimit/base current historyl historyl Nistoryl Fuel WC Method >5 <1.0 <1.0 <1.0 Glycol WC Method >0 NEG NEG NEG NEG Glycol WC Method >0 <1 <1 <1 <1 Glycol WC Method >0 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 | Sample Number | | Client Info | | KFS0006083 | KFS0003898 | KFS0001543 |
| Di Age hrs Client Info 403 0 0 Di Changed Client Info Changed Changed Changed Sample Status Image Imaged NORMAL NORMAL CONTAMINATION method Imit/base current history1 history2 Fuel WC Method >5 <1.0 <1.0 <1.0 Water WC Method >0 2 NEG NEG Water WC Method >0 24 38 44 Chromium ppm ASTM D5185m >20 <1 <1 <1 Nickel ppm ASTM D5185m >2 0 0 <1 Nickel ppm ASTM D5185m >2 0 <1 1 Lead ppm ASTM D5185m >2 0 <1 1 Lead ppm ASTM D5185m >2 0 <0 0 Copper ppm ASTM D5185m >30 | Oil Age hrs Client Info 403 0 0 Oil Changed Client Info Changed Changed Changed Sample Status Image Client Info ABNORMAL NORMAL NORMAL CONTAMINATION method limit/base current history1 history2 Fuel WC Method >5 <1.0 <1.0 <1.0 <1.0 Water WC Method >0.2 NEG NEG NEG Wear METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >20 <1 <1 <1 Nickel ppm ASTM D5185m >2 0 0 0 0 Silver ppm ASTM D5185m >2 0 <th></th> <th></th> <th>Client Info</th> <th></th> <th>24 May 2024</th> <th>23 Jun 2023</th> <th>09 Sep 2022</th> | | | Client Info | | 24 May 2024 | 23 Jun 2023 | 09 Sep 2022 |
| Dil ChangedClient InfoChanged ABNORMALChanged NORMALChanged NORMALSample StatusImmethodImit/basecurrenthistory1history2FuelWC Method>5<1.0<1.0<1.0WaterImit/basecurrentNEGNEGNEGGliycolWC Method>5.2NEGNEGNEGWEAR METALSmethodlimit/basecurrenthistory1history2IronppmASTM D5185m>10.0243844ChromiumppmASTM D5185m>200<1NickelppmASTM D5185m>200<1NickelppmASTM D5185m>200<1AluminumppmASTM D5185m>200<1AluminumppmASTM D5185m>330611122IrinppmASTM D5185m>15<123VanadiumppmASTM D5185m15<123VanadiumppmASTM D5185m15<1<11LeadppmASTM D5185m160000ADDITIVESmethodlimit/basecurrenthistory1history2BoronppmASTM D5185m100000ADDITIVESmethodlimit/basecurrenthistory1history2BariumppmASTM D5185m100566 | Oil Changed Sample Status I Client Info Changed ABNORMAL Changed NORMAL Changed NORMAL< | Machine Age | hrs | Client Info | | 4668 | 4265 | |
| Dil ChangedClient InfoChanged ABNORMALChanged NORMALChanged NORMALSample StatusImmethodImit/basecurrenthistory1history2FuelWC Method>5<1.0<1.0<1.0WaterImit/basecurrentNEGNEGNEGGliycolWC Method>5.2NEGNEGNEGWEAR METALSmethodlimit/basecurrenthistory1history2IronppmASTM D5185m>10.0243844ChromiumppmASTM D5185m>200<1NickelppmASTM D5185m>200<1NickelppmASTM D5185m>200<1AluminumppmASTM D5185m>200<1AluminumppmASTM D5185m>330611122IrinppmASTM D5185m>15<123VanadiumppmASTM D5185m15<123VanadiumppmASTM D5185m15<1<11LeadppmASTM D5185m160000ADDITIVESmethodlimit/basecurrenthistory1history2BoronppmASTM D5185m100000ADDITIVESmethodlimit/basecurrenthistory1history2BariumppmASTM D5185m100566 | Oil Changed Image Client Info Kanged Changed Changed NormAL NormAL NormAL Sample Status Image Image Current Normal Normal Normal Fue VC Method >5 <1.0 <1.0 <1.0 <1.0 Water VC Method >5 <1.0 <1.0 <1.0 <1.0 Glycol WC Method >5 <1.0 <1.0 NEG NEG Glycol WC Method >5 <1.0 <1.0 <1.0 <1.0 Method NCM NEG NEG NEG NEG NEG Chromium ppm ASIM 0585 >100 24 38 44 Chromium ppm ASIM 0585 >2 0 0 <1 Silver ppm ASIM 0585 >2 0 0 <1 Glandinum ppm ASIM 0585 >2 0 0 <1 Lead ppm ASIM 0585 >4 3 4 0 Copper ppm ASIM 0585 >15 <1< 2 3 Vinadium ppm ASIM 0585 >16 2 3 <tr< th=""><th>Oil Age</th><th>hrs</th><th>Client Info</th><th></th><th>403</th><th>0</th><th>0</th></tr<> | Oil Age | hrs | Client Info | | 403 | 0 | 0 |
| CONTAMINATION 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 NEG WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >100 24 38 44 Chromium ppm ASTM D5185m >20 <1 <1 <1 Nickel ppm ASTM D5185m >2 0 0 <1 Nickel ppm ASTM D5185m >2 0 0 <1 Aluminum ppm ASTM D5185m >25 <1 <1 1 Lead ppm ASTM D5185m >15 <1 2 3 Vanadium ppm ASTM D5185m <1 2 12 69 | CONTAMINATION 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 >0.2 NEG NEG NEG WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185n >100 24 38 44 Chromium ppm ASTM D5185n >2 0 0 0 Titanium ppm ASTM D5185n >2 0 0 0 Silver ppm ASTM D5185n >2 0 0 0 0 Copper ppm ASTM D5185n >40 3 3 4 0 0 Copper ppm ASTM D5185n >15 <1 2 3 Vanadium ppm ASTM D5185n 30 6 1 | | | Client Info | | Changed | Changed | Changed |
| Fuel WC Method >5 <1.0 | Fuel WC Method >5 <1.0 | Sample Status | | | | ABNORMAL | NORMAL | NORMAL |
| Water WC Method >0.2 NEG NEG NEG NEG NEG Glycol WC Method Imit/base current history1 history2 WEAR METALS method Imit/base current history1 history2 Iron ppm ASTM D5185m >20 <1 <1 <1 Nickel ppm ASTM D5185m >2 0 0 <1 Nickel ppm ASTM D5185m >2 0 0 <1 Aduminum ppm ASTM D5185m >2 0 0 <1 Lead ppm ASTM D5185m >2 0 0 <1 Lead ppm ASTM D5185m >2 0 0 0 Cadmium ppm ASTM D5185m >15 <1 2 3 Vanadium ppm ASTM D5185m 0 0 0 0 ADDITIVES method Imit/base current histor | Water WC Method >0.2 NEG NEG NEG Glycol WC Method Imit/base current history1 history2 Iron ppm ASTM D5165m >20 <1 <1 <1 Nickel ppm ASTM D5165m >20 <1 <1 <1 Nickel ppm ASTM D5165m >2 0 0 <1 Nickel ppm ASTM D5165m >2 0 0 <1 Aluminum ppm ASTM D5165m >2 0 0 <1 <1 Lead ppm ASTM D5165m >15 <1 2 3 <1 <1 Lead ppm ASTM D5165m >15 <1 2 3 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 1 1 <1 | CONTAMINATION | N | method | limit/base | current | history1 | history2 |
| Glycol WC Method NEG NEG NEG NEG WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >20 <1 <1 <1 Nickel ppm ASTM D5185m >20 <1 <1 <1 Nickel ppm ASTM D5185m >2 0 0 <1 Silver ppm ASTM D5185m >2 0 0 <1 Aluminum ppm ASTM D5185m >2 0 0 <1 1 Lead ppm ASTM D5185m >2 1 <1 1 2 1 Lead ppm ASTM D5185m >2 1 <1 0 0 0 Cadmium ppm ASTM D5185m <1 2 3 3 4 3 Baron ppm ASTM D5185m <1 0 0 0 0 0 0 | Glycol WC Method NEG NEG NEG WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >100 24 38 44 Chromium ppm ASTM D5185m >20 <1 <1 1 Nickel ppm ASTM D5185m >2 0 0 <1 Nickel ppm ASTM D5185m >2 0 0 <1 Aluminum ppm ASTM D5185m >2 0 0 <1 Lead ppm ASTM D5185m >25 <1 <1 1 2 3 Vanadium ppm ASTM D5185m >15 <1 2 3 0 | Fuel | | WC Method | >5 | <1.0 | <1.0 | <1.0 |
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| Chromium ppm ASTM D5185m >20 <1 | Chromium ppm ASTM D5185m >20 <1 <1 <1 Nickel ppm ASTM D5185m >2 0 0 <1 | Iron | ppm | ASTM D5185m | >100 | 24 | 38 | 44 |
| Nickel ppm ASTM D5185m >2 0 0 <1 | Nickel ppm ASTM D5185m >2 0 0 <1 Titanium ppm ASTM D5185m >2 0 0 0 0 Silver ppm ASTM D5185m >2 0 0 <1 | Chromium | | ASTM D5185m | >20 | <1 | <1 | <1 |
| Titanium ppm ASTM D5185m >2 0 0 0 Silver ppm ASTM D5185m >2 0 0 <1 Aluminum ppm ASTM D5185m >25 <1 <1 1 Lead ppm ASTM D5185m >40 3 3 4 Copper ppm ASTM D5185m >40 3 3 4 Copper ppm ASTM D5185m >15 <1 2 3 Vanadium ppm ASTM D5185m >15 <1 0 0 0 Cadmium ppm ASTM D5185m 0 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 0 0 0 Magnese ppm ASTM D5185m <1 <1 <1 <1 Magnesium ppm ASTM D5185m 1045 | Titanium ppm ASTM D5185m >2 0 0 0 Sliver ppm ASTM D5185m >2 0 0 <1 Aluminum ppm ASTM D5185m >25 <1 <1 1 Lead ppm ASTM D5185m >330 6 11 22 3 Copper ppm ASTM D5185m >330 6 11 22 3 Vanadium ppm ASTM D5185m >15 <1 2 3 Vanadium ppm ASTM D5185m <1 0 0 0 Cadmium ppm ASTM D5185m <0 0 0 0 Mandum ppm ASTM D5185m 2 12 69 6 Boron ppm ASTM D5185m 60 62 67 67 Manganese ppm ASTM D5185m 966 966 779 1117 Phosphorus ppm ASTM D5185m 1 | Nickel | | | | 0 | 0 | <1 |
| Silver ppm ASTM D5185m >2 0 0 <1 | Silver ppm ASTM D5185m >2 0 0 <1 | Titanium | | ASTM D5185m | >2 | 0 | 0 | 0 |
| Lead ppm ASTM D5185m >40 3 3 4 Copper ppm ASTM D5185m >330 6 11 22 Tin ppm ASTM D5185m >15 <1 2 3 Vanadium ppm ASTM D5185m >15 <1 0 0 Cadmium ppm ASTM D5185m 0 0 0 0 Cadmium ppm ASTM D5185m 0 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 0 0 0 Magnesee ppm ASTM D5185m 60 62 67 Manganese ppm ASTM D5185m 966 966 779 Calcium ppm ASTM D5185m 1045 1065 889 Zinc ppm ASTM D5185m 25 3 4 3 Solfur | Lead ppm ASTM D5185m >40 3 3 4 Copper ppm ASTM D5185m >330 6 111 22 3 Tin ppm ASTM D5185m >15 <1 2 3 Vanadium ppm ASTM D5185m >15 <1 2 3 Vanadium ppm ASTM D5185m 0 0 0 0 Cadmium ppm ASTM D5185m 0 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 0 0 0 Molybdenum ppm ASTM D5185m 60 62 67 Magnesium ppm ASTM D5185m 966 966 779 Calcium ppm ASTM D5185m 1045 1065 889 Zinc ppm ASTM D5185m 25 3 4 3 | Silver | | ASTM D5185m | >2 | 0 | 0 | <1 |
| Copper ppm ASTM D5185m >330 6 11 22 Tin ppm ASTM D5185m >15 <1 | Copper ppm ASTM D5185m >330 6 11 22 Tin ppm ASTM D5185m >15 <1 2 3 Vanadium ppm ASTM D5185m >15 <1 2 3 Vanadium ppm ASTM D5185m 0 0 0 0 Cadmium ppm ASTM D5185m 0 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 2 12 69 Barium ppm ASTM D5185m 60 62 67 Manganese ppm ASTM D5185m 606 62 67 Magnesium ppm ASTM D5185m 1045 1065 889 Zinc ppm ASTM D5185m 1045 1065 889 Zinc ppm ASTM D5185m 25 3 4 3 Sulfur ppm <td< th=""><th>Aluminum</th><th>ppm</th><th>ASTM D5185m</th><th>>25</th><th><1</th><th><1</th><th>1</th></td<> | Aluminum | ppm | ASTM D5185m | >25 | <1 | <1 | 1 |
| Tin ppm ASTM D5185m >15 <1 | Tin ppm ASTM D5185m >15 <1 | Lead | ppm | ASTM D5185m | >40 | 3 | 3 | 4 |
| Vanadium ppm ASTM D5185m <1 | Vanadium ppm ASTM D5185m <1 | Copper | ppm | ASTM D5185m | >330 | 6 | 11 | 22 |
| Cadmium ppm ASTM D5185m 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 2 12 69 Barium ppm ASTM D5185m 0 0 0 Molybdenum ppm ASTM D5185m 600 62 67 Magnesium ppm ASTM D5185m 600 62 67 Magnesium ppm ASTM D5185m 606 966 779 Calcium ppm ASTM D5185m 1203 1279 1117 Phosphorus ppm ASTM D5185m 1045 1065 889 Zinc ppm ASTM D5185m 1316 1335 1172 Sulfur ppm ASTM D5185m >25 3 4 3 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m>20 <1 | Cadmium ppm ASTM D5185m 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 2 12 69 69 Barium ppm ASTM D5185m 0 0 0 0 Molybdenum ppm ASTM D5185m 600 62 67 Manganese ppm ASTM D5185m 660 62 67 Magnesium ppm ASTM D5185m 966 966 779 Calcium ppm ASTM D5185m 1045 1065 889 Zinc ppm ASTM D5185m 1045 1065 889 Zinc ppm ASTM D5185m 1045 1065 889 Zinc ppm ASTM D5185m 25 3 4 3 Sulfur ppm ASTM D5185m >20 21 21 22 Sodium ppm ASTM D5185m | Tin | ppm | ASTM D5185m | >15 | <1 | 2 | 3 |
| ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 2 12 69 Barium ppm ASTM D5185m 0 0 0 Molybdenum ppm ASTM D5185m 60 62 67 Manganese ppm ASTM D5185m 60 62 67 Magnesium ppm ASTM D5185m 966 966 779 Calcium ppm ASTM D5185m 1045 1065 889 Zinc ppm ASTM D5185m 1045 1065 889 Zinc ppm ASTM D5185m 1316 1335 1172 Sulfur ppm ASTM D5185m 2698 2698 2698 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >20 <1 2 2 Potassium ppm ASTM D5185m >20 | ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 2 12 69 Barium ppm ASTM D5185m 2 12 69 Barium ppm ASTM D5185m 60 62 67 Manganese ppm ASTM D5185m 600 62 67 Magnesium ppm ASTM D5185m 966 966 779 Calcium ppm ASTM D5185m 966 966 779 Calcium ppm ASTM D5185m 1045 1065 889 Zinc ppm ASTM D5185m 1045 1065 889 Zinc ppm ASTM D5185m 1316 1335 1172 Sulfur ppm ASTM D5185m >25 3 4 3 Sodium ppm ASTM D5185m >20 <1 <1 0 INFRA-RED method limit/base current <td< th=""><th>Vanadium</th><th>ppm</th><th>ASTM D5185m</th><th></th><th><1</th><th>0</th><th>0</th></td<> | Vanadium | ppm | ASTM D5185m | | <1 | 0 | 0 |
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| Manganese ppm ASTM D5185m <1 | Marganese ppm ASTM D5185m <1 | ADDITIVES | | method | limit/base | current | history1 | history2 |
| Magnesium ppm ASTM D5185m 966 966 779 Calcium ppm ASTM D5185m 1203 1279 1117 Phosphorus ppm ASTM D5185m 1045 1065 889 Zinc ppm ASTM D5185m 1316 1335 1172 Sulfur ppm ASTM D5185m 3637 3785 2698 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 3 4 3 Sodium ppm ASTM D5185m >20 <1 2 2 Potassium ppm ASTM D5185m >20 <1 0 1 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.2 0.3 0.3 Nitration Abs/cm *ASTM D7624 >20 7.1 8.2 8.5 < | Magnesium ppm ASTM D5185m 966 966 779 Calcium ppm ASTM D5185m 1203 1279 1117 Phosphorus ppm ASTM D5185m 1045 1065 889 Zinc ppm ASTM D5185m 1045 1065 889 Zinc ppm ASTM D5185m 1316 1335 1172 Sulfur ppm ASTM D5185m 3637 3785 2698 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 3 4 3 Sodium ppm ASTM D5185m >20 <1 2 2 Potassium ppm ASTM D5185m >20 <1 <1 0 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7624 >20 7.1 8.2 8.5 Sulfation | ADDITIVES Boron | ppm | method ASTM D5185m | limit/base | current 2 | history1 12 | history2 69 |
| Calcium ppm ASTM D5185m 1203 1279 1117 Phosphorus ppm ASTM D5185m 1045 1065 889 Zinc ppm ASTM D5185m 1316 1335 1172 Sulfur ppm ASTM D5185m 3637 3785 2698 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 3 4 3 Sodium ppm ASTM D5185m >25 3 4 3 Sodium ppm ASTM D5185m >20 <1 2 2 Potassium ppm ASTM D5185m >20 <1 <1 0 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.2 0.3 0.3 Nitration Abs/cm *ASTM D7624 >20 7.1 8.2 8.5 < | Calcium ppm ASTM D5185m 1203 1279 1117 Phosphorus ppm ASTM D5185m 1045 1065 889 Zinc ppm ASTM D5185m 1316 1335 1172 Sulfur ppm ASTM D5185m 3637 3785 2698 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 3 4 3 Sodium ppm ASTM D5185m >25 3 4 3 Sodium ppm ASTM D5185m >20 <1 2 2 Potassium ppm ASTM D7844 >3 0.2 0.3 0.3 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.2 0.3 0.3 Nitration Abs/cm *ASTM D7624 >20 7.1 8.2 8.5 | ADDITIVES Boron Barium | ppm ppm | method ASTM D5185m ASTM D5185m | limit/base | current 2 0 | history1 12 0 | history2 69 0 |
| Phosphorus ppm ASTM D5185m 1045 1065 889 Zinc ppm ASTM D5185m 1316 1335 1172 Sulfur ppm ASTM D5185m 3637 3785 2698 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 3 4 3 Sodium ppm ASTM D5185m >25 3 4 3 Sodium ppm ASTM D5185m >20 <1 | Phosphorus ppm ASTM D5185m 1045 1065 889 Zinc ppm ASTM D5185m 1316 1335 1172 Sulfur ppm ASTM D5185m 3637 3785 2698 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 3 4 3 Sodium ppm ASTM D5185m >25 3 4 3 Sodium ppm ASTM D5185m >20 <1 2 2 Potassium ppm ASTM D5185m >20 <1 0 0 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7624 >20 7.1 8.2 8.5 Sulfation Abs/cm *ASTM D7415 >30 18.7 20.4 22.2 FLUID DEGRADATION method limit/base current history1 his | ADDITIVES Boron Barium Molybdenum | ppm ppm ppm | method ASTM D5185m ASTM D5185m ASTM D5185m | limit/base | current 2 0 60 | history1 12 0 62 | history2 69 0 67 |
| Zinc ppm ASTM D5185m 1316 1335 1172 Sulfur ppm ASTM D5185m 3637 3785 2698 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 3 4 3 Sodium ppm ASTM D5185m >25 3 4 3 Sodium ppm ASTM D5185m >25 3 4 3 Potassium ppm ASTM D5185m >20 <1 2 2 NtFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.2 0.3 0.3 Nitration Abs/cm *ASTM D7624 >20 7.1 8.2 8.5 Sulfation Abs/.1mm *ASTM D7415 >30 18.7 20.4 22.2 | Zinc ppm ASTM D5185m 1316 1335 1172 Sulfur ppm ASTM D5185m 3637 3785 2698 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 3 4 3 Sodium ppm ASTM D5185m >20 <1 2 2 Potassium ppm ASTM D5185m >20 <1 <1 0 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7624 >20 7.1 8.2 8.5 Sulfation Abs/cm *ASTM D7624 >20 7.1 8.2 8.5 Sulfation Abs/.1mm *ASTM D7415 >30 18.7 20.4 22.2 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 14 | ADDITIVES Boron Barium Molybdenum Manganese | ppm ppm ppm ppm | method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m | limit/base | current 2 0 60 <1 | history1 12 0 62 <1 | history2 69 0 67 <1 |
| SulfurppmASTM D5185m363737852698CONTAMINANTSmethodlimit/basecurrenthistory1history2SiliconppmASTM D5185m>25343SodiumppmASTM D5185m>25343PotassiumppmASTM D5185m>20<122PotassiumppmASTM D5185m>20<1<10INFRA-REDmethodlimit/basecurrenthistory1history2Soot %%*ASTM D7844>30.20.30.3NitrationAbs/cm*ASTM D7624>207.18.28.5SulfationAbs/.1mm*ASTM D7415>3018.720.422.2 | SulfurppmASTM D5185m363737852698CONTAMINANTSmethodlimit/basecurrenthistory1history2SiliconppmASTM D5185m>25343SodiumppmASTM D5185m>20<122PotassiumppmASTM D5185m>20<1<10INFRA-REDmethodlimit/basecurrenthistory1history2Soot %%*ASTM D7844>30.20.30.3NitrationAbs/cm*ASTM D7624>207.18.28.5SulfationAbs/lmm*ASTM D7415>3018.720.422.2FLUID DEGRADATIONmethodlimit/basecurrenthistory1history2OxidationAbs/lmm*ASTM D7414>2514.816.317.1 | ADDITIVES Boron Barium Molybdenum Manganese Magnesium | ppm ppm ppm ppm ppm | method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m | limit/base | 2 0 60 <1 966 | history1 12 0 62 <1 966 | history2 69 0 67 <1 779 |
| CONTAMINANTSmethodlimit/basecurrenthistory1history2SiliconppmASTM D5185m<>25343SodiumppmASTM D5185m<122PotassiumppmASTM D5185m>20<1<10INFRA-REDmethodlimit/basecurrenthistory1history2Soot %%*ASTM D7844>30.20.30.3NitrationAbs/cm*ASTM D7624>207.18.28.5SulfationAbs/.1mm*ASTM D7415>3018.720.422.2 | CONTAMINANTSmethodlimit/basecurrenthistory1history2SiliconppmASTM D5185m>25343SodiumppmASTM D5185m<122PotassiumppmASTM D5185m>20<1<10INFRA-REDmethodlimit/basecurrenthistory1history2Soot %%*ASTM D7844>30.20.30.3NitrationAbs/cm*ASTM D7624>207.18.28.5SulfationAbs/lmm*ASTM D7415>3018.720.422.2FLUID DEGRADATIONmethodlimit/basecurrenthistory1history2OxidationAbs/lmm*ASTM D7414>2514.816.317.1 | ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium | ppm ppm ppm ppm ppm ppm | methodASTM D5185mASTM D5185mASTM D5185mASTM D5185mASTM D5185mASTM D5185m | limit/base | current 2 0 60 <1 966 1203 | history1 12 0 62 <1 966 1279 | history2 69 0 67 <1 779 1117 |
| Silicon ppm ASTM D5185m >25 3 4 3 Sodium ppm ASTM D5185m <21 | Silicon ppm ASTM D5185m >25 3 4 3 Sodium ppm ASTM D5185m <1 | ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus | ppm ppm ppm ppm ppm ppm ppm | Method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m | limit/base | Current 2 0 60 <1 966 1203 1045 | history1 12 0 62 <1 966 1279 1065 | history2 69 0 67 <1 779 1117 889 |
| Sodium ppm ASTM D5185m <1 | Sodium ppm ASTM D5185m <1 | ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc | ppm ppm ppm ppm ppm ppm ppm ppm | method ASTM D5185m | limit/base | current 2 0 60 <1 966 1203 1045 1316 | history1 12 0 62 <1 966 1279 1065 1335 | history2 69 0 67 <1 779 1117 889 1172 |
| Potassium ppm ASTM D5185m >20 <1 | Potassium ppm ASTM D5185m >20 <1 | ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur | ppm ppm ppm ppm ppm ppm ppm ppm | method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m | | Current 2 0 60 <1 966 1203 1045 1316 3637 | history1 12 0 62 <1 966 1279 1065 1335 3785 | history2 69 0 67 <1 779 1117 889 1172 2698 |
| INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.2 0.3 0.3 Nitration Abs/cm *ASTM D7624 >20 7.1 8.2 8.5 Sulfation Abs/.1mm *ASTM D7415 >30 18.7 20.4 22.2 | INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0.2 0.3 0.3 Nitration Abs/cm *ASTM D7624 >20 7.1 8.2 8.5 Sulfation Abs/.1mm *ASTM D7415 >30 18.7 20.4 22.2 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 14.8 16.3 17.1 | ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS | ppm ppm ppm ppm ppm ppm ppm ppm | method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m | limit/base | current 2 0 60 <1 966 1203 1045 1316 3637 current | history1 12 0 62 <1 966 1279 1065 1335 3785 history1 | history2 69 0 67 <1 779 1117 889 1172 2698 history2 |
| Soot % % *ASTM D7844 >3 0.2 0.3 0.3 Nitration Abs/cm *ASTM D7624 >20 7.1 8.2 8.5 Sulfation Abs/.1mm *ASTM D7415 >30 18.7 20.4 22.2 | Soot % % *ASTM D7844 >3 0.2 0.3 0.3 Nitration Abs/cm *ASTM D7624 >20 7.1 8.2 8.5 Sulfation Abs/.1mm *ASTM D7415 >30 18.7 20.4 22.2 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 14.8 16.3 17.1 | ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon | ppm ppm ppm ppm ppm ppm ppm ppm ppm | method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m | limit/base | current 2 0 60 <1 966 1203 1045 1316 3637 current 3 | history1 12 0 62 <1 966 1279 1065 1335 3785 history1 4 | history2 69 0 67 <1 779 1117 889 1172 2698 history2 3 |
| Nitration Abs/cm *ASTM D7624 >20 7.1 8.2 8.5 Sulfation Abs/.1mm *ASTM D7415 >30 18.7 20.4 22.2 | Nitration Abs/cm *ASTM D7624 >20 7.1 8.2 8.5 Sulfation Abs/.1mm *ASTM D7415 >30 18.7 20.4 22.2 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 14.8 16.3 17.1 | ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium | ppm ppm ppm ppm ppm ppm ppm ppm ppm | method ASTM D5185m | limit/base >25 | current 2 0 60 <1 966 1203 1045 1316 3637 current 3 <1 | history1 12 0 62 <1 966 1279 1065 1335 3785 history1 4 2 | history2 69 0 67 <1 779 1117 889 1172 2698 history2 3 2 |
| Sulfation Abs/.1mm *ASTM D7415 >30 18.7 20.4 22.2 | Sulfation Abs/.1mm *ASTM D7415 >30 18.7 20.4 22.2 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 14.8 16.3 17.1 | ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium | ppm ppm ppm ppm ppm ppm ppm ppm ppm | method ASTM D5185m | limit/base >25 >20 | current 2 0 60 <1 966 1203 1045 1316 3637 current 3 <1 <1 | history1 12 0 62 <1 966 1279 1065 1335 3785 history1 4 2 <1 | history2 69 0 67 <1 779 1117 889 1172 2698 history2 3 2 0 |
| | FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 14.8 16.3 17.1 | ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium | ppm ppm ppm ppm ppm ppm ppm ppm ppm | method ASTM D5185m | limit/base >25 >20 limit/base | 2 0 60 <1 966 1203 1045 1316 3637 current 3 <1 <1 <1 <1 current | history1 12 0 62 <1 966 1279 1065 1335 3785 history1 4 2 <1 history1 | history2 69 0 67 <1 779 1117 889 1172 2698 history2 3 2 0 history2 |
| | Oxidation Abs/.1mm *ASTM D7414 >25 14.8 16.3 17.1 | ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED | ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm | method ASTM D5185m | limit/base >25 >20 limit/base >3 | current 2 0 60 <1 966 1203 1045 1316 3637 current 3 <1 <1 current 0.2 | history1 12 0 62 <1 966 1279 1065 1335 3785 history1 4 2 <1 history1 0.3 | history2 69 0 67 <1 779 1117 889 1172 2698 history2 3 2 0 history2 0 0.3 |
| FLUID DEGRADATION method limit/base current history1 history2 | | ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED Soot % Nitration | ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm | method ASTM D5185m | limit/base >25 >20 limit/base >3 >20 | current 2 0 60 <1 966 1203 1045 1316 3637 current 3 <1 <1 0.2 7.1 | history1 12 0 62 <1 966 1279 1065 1335 3785 history1 4 2 <1 history1 4 2 <1 history1 0.3 8.2 | history2 69 0 67 <1 779 1117 889 1172 2698 history2 3 2 0 history2 0 history2 0.3 8.5 |
| Dxidation Abs/.1mm *ASTM D7414 >25 14.8 16.3 17.1 | Base Number (BN) mgK0H/g ASTM D2896 9.8 10.22 11.08 9.4 | ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation | ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm | method ASTM D5185m ASTM D5185m | limit/base >25 >20 limit/base >3 >20 >3 >20 | Current 2 0 60 <1 966 1203 1045 1316 3637 current 3 <1 <1 0.2 7.1 18.7 | history1 12 0 62 <1 966 1279 1065 1335 3785 history1 4 2 <1 history1 0.3 8.2 20.4 | history2 69 0 67 <1 779 1117 889 1172 2698 history2 3 2 0 history2 0.3 8.5 22.2 |
| Base Number (BN) mg KOH/g ASTM D2896 9.8 10.22 11.08 9.4 | | ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation FLUID DEGRADA | ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm | method ASTM D5185m ASTM D718544 *ASTM D7624 *ASTM D7415 method | limit/base >25 >20 limit/base >3 >20 >30 limit/base | current 2 0 60 <1 966 1203 1045 1316 3637 current 3 <1 current 0.2 7.1 18.7 current | history1 12 0 62 <1 966 1279 1065 1335 3785 history1 4 2 <1 history1 4 2 <1 history1 0.3 8.2 20.4 history1 | history2 69 0 67 <1 779 1117 889 1172 2698 history2 3 2 0 history2 0 history2 0.3 8.5 22.2 history2 |



OIL ANALYSIS REPORT





| VISUAL | | method | limit/bas | e current | history1 | history |
|-------------------------|----------|------------|------------------------|--|-----------|---|
| White Metal | scalar | *Visual | NONE | | NONE | NONE |
| Yellow Metal | scalar | *Visual | NONE | NONE | NONE | NONE |
| Precipitate | scalar | *Visual | NONE | NONE | NONE | NONE |
| Silt | scalar | *Visual | NONE | NONE | NONE | NONE |
| Debris | scalar | *Visual | NONE | NONE | NONE | NONE |
| Sand/Dirt | scalar | *Visual | NONE | NONE | NONE | NONE |
| Appearance | scalar | *Visual | NORML | NORML | NORML | NORML |
| Odor | scalar | *Visual | NORML | NORML | NORML | NORML |
| Emulsified Water | scalar | *Visual | >0.2 | NEG | NEG | NEG |
| Free Water | scalar | *Visual | 2 012 | NEG | NEG | NEG |
| FLUID PROPER | TIES | method | limit/bas | e current | history1 | history |
| Visc @ 100°C | cSt | ASTM D445 | 15.6 | 12.9 | 12.8 | 13.3 |
| GRAPHS | | | | | | |
| Iron (ppm) | | | | Lead (ppm |) | |
| 250 Severe | | | | 100 Severe | | |
| 200 - 4 | | | | 80 - | | 1 |
| a 150 100 - Abnormal | | | mag | 40 Abnormal | | |
| 50 - | | | | 20 | | |
| 0 | | | | 0 | | |
| Mar4/22 - Sep9/22 - | | Jun23/23 . | May24/24 - | Mar4/22 - | Sep9/22 . | . 52/53/UNC |
| Sep | | Juni | Mayź | Ma | Sei | unr |
| Aluminum (ppm) | | | | Chromium | (ppm) | |
| 50 Severe | | | | 50 Severe | | |
| | | | | | | •••••••••••••••••••••••••••••••••••••• |
| Bandaria Abnormal | | 1 | | 20 - Abnormal | | |
| | | | | | | * * * * * * * * * * * * * * * * * * * |
| 10 | | | | 10 | | |
| Mar4/22 | | 3/23 - | 4/24 | Mar4/22 | Sep9/22 - | 3/23 |
| Sep | | Jun23/23 | May24/24 | Mar | Sep | ZUNC |
| Copper (ppm) | | | | Silicon (ppi ⁸⁰ T Severe | m) | |
| Aproma | | | | | | |
| 300- | | | | 60 | | |
| 틆 200 - | | | | Abnormal | | |
| 100- | | | | 20- | | |
| | | | - | | | |
| Mar4/22 Sep9/22 | | Jun23/23 | May24/24 | Mar4/22 | Sep 9/22 | 7/671 |
| | _ | Jur | Mar | | - | |
| Viscosity @ 100° | . | | , - | Base Numb | ber | |
| 18 - Abnormal | | | (B/HO | 10.0 Base | | |
| 1 | | | Mg K | 8.0 | | |
| 0 16 Base | | | mber | 6.0 | | |
| 12 - Abnormal | | | Base Number (mg KOH/g) | 4.0 | | |
| 10 | | | | 0.0 | | |
| | | Jun23/23 | May24/24 | Mar4/22 | Sep 9/22 | , c2/c2 |
| Mar4/22 Sep 9/22 | | 23 | 24 | 10 | | ý. |

- 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)

Report Id: HARCOLTN [WUSCAR] 06196026 (Generated: 06/02/2024 11:21:04) Rev: 1

Certificate L2367

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Page 2 of 2

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