

OIL ANALYSIS REPORT

Sample Rating Trend





Machine Id 4693M Component

Diesel Engine

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

| Sample Date Client Info 25 Jun 2023 24 Machine Age hrs Client Info 10540 10 Dil Age hrs Client Info 600 60 Dil Age hrs Client Info 600 60 Dil Age hrs Client Info 600 60 Dil Age hrs Client Info Changed C Sample Status NORMAL N N N CONTAMINATION method limit/base current Fuel WC Method >5 <1.0 NEG WEAR METALS method limit/base current Foromium ppm ASTM D5185m >5 3 Silver ppm ASTM D5185m >3 0 Numinum ppm ASTM D5185m >150 2 Cin ppm ASTM D5185m >3 0 1 Anadium ppm ASTM D5185m >0 1 3 <t< th=""><th>2023</th><th></th></t<> | 2023 | |
|---|------------|-------------|
| Sample Date Client Info 25 Jun 2023 24 Machine Age hrs Client Info 10540 10 Dil Age hrs Client Info 600 60 Dil Age hrs Client Info 600 60 Dil Changed Client Info Changed C Sample Status NORMAL N CONTAMINATION method limit/base current Fuel WC Method >5 <1.0 Glycol WC Method >5 <1.0 Fuel WC Method >5 <1.0 Machine ppm ASTM D5185m >80 25 Chromium ppm ASTM D5185m >2 0 Silver ppm ASTM D5185m >3 0 Cadmium ppm ASTM D5185m >150 2 1 Vanadium ppm ASTM D5185m >10 1 3 Cadmium ppm ASTM D5185m 0 | history 1 | history 2 |
| Machine Age hrs Client Info 10540 10 Dil Age hrs Client Info 600 60 Sample Status Image Client Info Changed Client Info CONTAMINATION method Imit/base current Fuel WC Method >5 <1.0 | FL0081317 | GFL006331 |
| Dil AgehrsClient Info60060Dil ChangedClient InfoChangedClient InfoChangedClient InfoSample StatusImit/basecurrentVertice WC Method>5<1.0 | 4 Apr 2023 | 04 Jan 2023 |
| Dil ChangedClient InfoChangedClangedCSample StatusImageNORMALNCONTAMINATIONmethodlimit/basecurrentFuelWC Method>5<1.0 | 0016 | 8590 |
| Sample Status NORMAL N CONTAMINATION method limit/base current Fuel WC Method >5 <1.0 | 00 | 8590 |
| CONTAMINATION method limit/base current Fuel WC Method >5 <1.0 | hanged | Changed |
| Fuel WC Method >5 <1.0 Glycol WC Method NEG NEG WEAR METALS method limit/base current Iron ppm ASTM D5185m >80 25 Chromium ppm ASTM D5185m >50 3 Nickel ppm ASTM D5185m >2 0 Titanium ppm ASTM D5185m >3 0 Aluminum ppm ASTM D5185m >30 3 2 Cadd ppm ASTM D5185m >30 3 2 1 Silver ppm ASTM D5185m >30 0 2 1 Cadd ppm ASTM D5185m >30 0 2 1 Vanadium ppm ASTM D5185m >150 2 1 Vanadium ppm ASTM D5185m 0 1 1 Barium ppm ASTM D5185m 0 1 1 2 Bari | IORMAL | NORMAL |
| CitycolWC MethodNEGWEAR METALSmethodlimit/basecurrentIronppmASTM D5185m>8025ChromiumppmASTM D5185m>53NickelppmASTM D5185m>20FitaniumppmASTM D5185m>30SilverppmASTM D5185m>30AuminumppmASTM D5185m>303LeadppmASTM D5185m>1502CopperppmASTM D5185m>5<1 | history 1 | history 2 |
| WEAR METALS method limit/base current Iron ppm ASTM D5185m >80 25 Chromium ppm ASTM D5185m >5 3 Nickel ppm ASTM D5185m >2 0 Titanium ppm ASTM D5185m >2 0 Silver ppm ASTM D5185m >3 0 Aluminum ppm ASTM D5185m >3 0 Lead ppm ASTM D5185m >30 0 Copper ppm ASTM D5185m >30 0 Cadmium ppm ASTM D5185m 0 0 Cadmium ppm ASTM D5185m 0 1 Baron ppm ASTM D5185m 0 1 Barium ppm ASTM D5185m 0 1 Manganese ppm ASTM D5185m 0 1 Calcium ppm ASTM D5185m 1010 874 Colatium ppm ASTM D | <1.0 | <1.0 |
| ronppmASTM D5185m>80253NickelppmASTM D5185m>201FitaniumppmASTM D5185m>201SilverppmASTM D5185m>301AluminumppmASTM D5185m>3031LeadppmASTM D5185m>30021CopperppmASTM D5185m>50<1 | NEG | NEG |
| Dromium ppm ASTM D5185m >5 3 Nickel ppm ASTM D5185m >2 0 Titanium ppm ASTM D5185m >2 0 Silver ppm ASTM D5185m >3 0 Aluminum ppm ASTM D5185m >30 3 1 Lead ppm ASTM D5185m >30 0 1 Copper ppm ASTM D5185m >5 <1 | history 1 | history 2 |
| Dromium ppm ASTM D5185m >5 3 Nickel ppm ASTM D5185m >2 0 Titanium ppm ASTM D5185m >2 0 Silver ppm ASTM D5185m >3 0 Aluminum ppm ASTM D5185m >30 3 1 Lead ppm ASTM D5185m >30 0 1 Copper ppm ASTM D5185m >5 <1 | 17 | 9 |
| NickelppmASTM D5185m>20TitaniumppmASTM D5185m1SilverppmASTM D5185m>30AluminumppmASTM D5185m>303LeadppmASTM D5185m>300CopperppmASTM D5185m>1502TinppmASTM D5185m>51VanadiumppmASTM D5185m>51VanadiumppmASTM D5185m001CadmiumppmASTM D5185m01BoronppmASTM D5185m001BariumppmASTM D5185m001BariumppmASTM D5185m01MagneseeppmASTM D5185m1010874CalciumppmASTM D5185m1010874CalciumppmASTM D5185m10701079PhosphorusppmASTM D5185m12701212SulfurppmASTM D5185m20602942CONTAMINANTSmethodlimit/basecurrentSiliconppmASTM D5185m>202INFRA-REDmethodlimit/basecurrentSoot %%*ASTM D7844>30.3NitrationAbs/cm*ASTM D7624>209.0SulfationAbs/cm*ASTM D7645>3020.4 | <1 | <1 |
| Titanium ppm ASTM D5185m <1 Silver ppm ASTM D5185m >3 0 Aluminum ppm ASTM D5185m >30 3 Lead ppm ASTM D5185m >30 0 Copper ppm ASTM D5185m >150 2 Tin ppm ASTM D5185m >5 <1 | 0 | 0 |
| Silver ppm ASTM D5185m >3 O Aluminum ppm ASTM D5185m >30 3 I Lead ppm ASTM D5185m >30 0 I Copper ppm ASTM D5185m >150 2 I Tin ppm ASTM D5185m >5 <1 | 0 | 0 |
| AluminumppmASTM D5185m>303LeadppmASTM D5185m>300CopperppmASTM D5185m>1502TinppmASTM D5185m>5<1 | 0 | 0 |
| Lead ppm ASTM D5185m >30 0 Copper ppm ASTM D5185m >150 2 1 Tin ppm ASTM D5185m >5 <1 | 2 | 2 |
| Copper ppm ASTM D5185m >150 2 Tin ppm ASTM D5185m >5 <1 | 0 | <1 |
| TinppmASTM D5185m>5<1VanadiumppmASTM D5185m0CadmiumppmASTM D5185m0CadmiumppmASTM D5185m0ADDITIVESmethodlimit/basecurrentBoronppmASTM D5185m01BariumppmASTM D5185m00ManganeseppmASTM D5185m0<1 | <1 | <1 |
| VanadiumppmASTM D5185m0CadmiumppmASTM D5185m0ADDITIVESmethodlimit/basecurrentBoronppmASTM D5185m01BariumppmASTM D5185m00MolybdenumppmASTM D5185m00MagnesiumppmASTM D5185m0<1 | 0 | <1 |
| CadmiumppmASTM D5185m0ADDITIVESmethodlimit/basecurrentBoronppmASTM D5185m01BariumppmASTM D5185m00MolybdenumppmASTM D5185m6059ManganeseppmASTM D5185m0<1 | 0 | 0 |
| ADDITIVESmethodlimit/basecurrentBoronppmASTM D5185m01BariumppmASTM D5185m00MolybdenumppmASTM D5185m6059ManganeseppmASTM D5185m0<1 | 0 | 0 |
| Boron ppm ASTM D5185m 0 1 Barium ppm ASTM D5185m 0 0 0 Molybdenum ppm ASTM D5185m 60 59 Manganese ppm ASTM D5185m 0 <1 | | history 2 |
| Barium ppm ASTM D5185m 0 0 Molybdenum ppm ASTM D5185m 60 59 Manganese ppm ASTM D5185m 0 <1 | history 1 | |
| Molybdenum ppm ASTM D5185m 60 59 Manganese ppm ASTM D5185m 0 <1 | 0 | 2 |
| Manganese ppm ASTM D5185m 0 <1 Magnesium ppm ASTM D5185m 1010 874 Calcium ppm ASTM D5185m 1010 874 Calcium ppm ASTM D5185m 1070 1079 Phosphorus ppm ASTM D5185m 1150 976 Zinc ppm ASTM D5185m 1270 1212 Sulfur ppm ASTM D5185m 2060 2942 CONTAMINANTS method limit/base current Silicon ppm ASTM D5185m >20 15 Sodium ppm ASTM D5185m >20 2 INFRA-RED method limit/base current Soot % % *ASTM D7844 >3 0.3 Nitration Abs/cm *ASTM D7624 >20 9.0 Sulfation Abs/.1mm *ASTM D7415 >30 20.4 | 0 | 0 |
| Magnesium ppm ASTM D5185m 1010 874 Calcium ppm ASTM D5185m 1070 1079 Phosphorus ppm ASTM D5185m 1150 976 Zinc ppm ASTM D5185m 1270 1212 Sulfur ppm ASTM D5185m 2060 2942 CONTAMINANTS method limit/base current Silicon ppm ASTM D5185m >20 15 Sodium ppm ASTM D5185m >20 2 INFRA-RED method limit/base current Soot % % *ASTM D7844 >3 0.3 Nitration Abs/cm *ASTM D7415 >30 20.4 | 58 | 56 |
| Calcium ppm ASTM D5185m 1070 1079 Phosphorus ppm ASTM D5185m 1150 976 Zinc ppm ASTM D5185m 1270 1212 Sulfur ppm ASTM D5185m 2060 2942 CONTAMINANTS method limit/base current Silicon ppm ASTM D5185m >20 15 Sodium ppm ASTM D5185m >20 15 Sodium ppm ASTM D5185m >20 2 INFRA-RED method limit/base current Soot % % *ASTM D7844 >3 0.3 Nitration Abs/.mm *ASTM D7415 >30 20.4 | <1 | <1 |
| Phosphorus ppm ASTM D5185m 1150 976 Zinc ppm ASTM D5185m 1270 1212 1212 Sulfur ppm ASTM D5185m 2060 2942 2942 CONTAMINANTS method limit/base current Silicon ppm ASTM D5185m >20 15 Sodium ppm ASTM D5185m >20 15 Potassium ppm ASTM D5185m >20 2 INFRA-RED method limit/base current Soot % % *ASTM D7844 >3 0.3 Nitration Abs/.mm *ASTM D7415 >30 20.4 | 931 | 872 |
| Zinc ppm ASTM D5185m 1270 1212 Sulfur ppm ASTM D5185m 2060 2942 CONTAMINANTS method limit/base current Silicon ppm ASTM D5185m >20 15 Sodium ppm ASTM D5185m >20 15 Sodium ppm ASTM D5185m >20 2 INFRA-RED method limit/base current Soot % % *ASTM D7844 >3 0.3 Nitration Abs/cm *ASTM D7624 >20 9.0 Sulfation Abs/.1mm *ASTM D7415 >30 20.4 | 1038 | 1015 |
| SulfurppmASTM D5185m20602942CONTAMINANTSmethodlimit/basecurrentSiliconppmASTM D5185m>2015SodiumppmASTM D5185m202PotassiumppmASTM D5185m>202INFRA-REDmethodlimit/basecurrentSoot %%*ASTM D7844>30.3NitrationAbs/cm*ASTM D7624>209.0SulfationAbs/.1mm*ASTM D7415>3020.4 | 946 | 931 |
| CONTAMINANTSmethodlimit/basecurrentSiliconppmASTM D5185m>2015SodiumppmASTM D5185m7PotassiumppmASTM D5185m>202INFRA-REDmethodlimit/basecurrentSoot %%*ASTM D7844>30.3NitrationAbs/cm*ASTM D7624>209.0SulfationAbs/.1mm*ASTM D7415>3020.4 | 1210 | 1190 |
| Silicon ppm ASTM D5185m >20 15 Sodium ppm ASTM D5185m >20 7 Potassium ppm ASTM D5185m >20 2 INFRA-RED method limit/base current Soot % % *ASTM D7844 >3 0.3 Nitration Abs/cm *ASTM D7624 >20 9.0 Sulfation Abs/.1mm *ASTM D7415 >30 20.4 | 2963 | 3193 |
| Sodium ppm ASTM D5185m 7 Potassium ppm ASTM D5185m >20 2 INFRA-RED method limit/base current Soot % % *ASTM D7844 >3 0.3 Nitration Abs/cm *ASTM D7624 >20 9.0 Sulfation Abs/.1mm *ASTM D7415 >30 20.4 | history 1 | history 2 |
| Potassium ppm ASTM D5185m >20 2 INFRA-RED method limit/base current Soot % % *ASTM D7844 >3 0.3 Nitration Abs/cm *ASTM D7624 >20 9.0 Sulfation Abs/.1mm *ASTM D7415 >30 20.4 | 3 | 3 |
| INFRA-REDmethodlimit/basecurrentSoot %%*ASTM D7844>30.3NitrationAbs/cm*ASTM D7624>209.0SulfationAbs/.1mm*ASTM D7415>3020.4 | 6 | 4 |
| Soot % % *ASTM D7844 >3 0.3 Nitration Abs/cm *ASTM D7624 >20 9.0 Sulfation Abs/.1mm *ASTM D7415 >30 20.4 | 0 | 0 |
| Nitration Abs/cm *ASTM D7624 >20 9.0 Sulfation Abs/.1mm *ASTM D7415 >30 20.4 | history 1 | history 2 |
| Sulfation Abs/.1mm *ASTM D7415 >30 20.4 | 0.4 | 0.3 |
| - | 9.5 | 8.2 |
| FLUID DEGRADATION method limit/base current | 19.8 | 18.9 |
| | history 1 | history 2 |
| Dxidation Abs/.1mm *ASTM D7414 >25 17.6 | 18.8 | 15.6 |
| Base Number (BN) mg KOH/g ASTM D2896 9.8 8.0 | 5.8 | 8.7 |

Recommendation

Resample at the next service interval to monitor. (Customer Sample Comment: Current hrs. 5505)

Wear

All component wear rates are normal.

Contamination

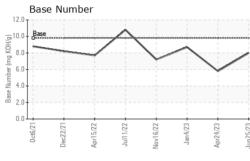
There is no indication of any contamination in the oil.

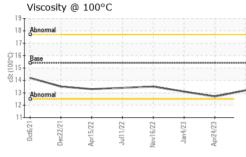
Fluid Condition

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



OIL ANALYSIS REPORT





| | VISUAL | | method | limit/base | current | history 1 | history 2 |
|---------------------------------|---------------------------------|----------------------|---------------------|-------------------------------|---------------------------------|----------------------|---------------------------------------|
| | White Metal | scalar | *Visual | NONE | NONE | NONE | NONE |
| \sim / | Yellow Metal | scalar | *Visual | NONE | NONE | NONE | NONE |
| \sim | 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 |
| Jan4/23 Apr24/23 Jun25/23 | Appearance | scalar | *Visual | NORML | NORML | NORML | NORML |
| Apr | | scalar | *Visual | NORML | NORML | NORML | NORML |
| | Emulsified Water | scalar | *Visual | >0.2 | NEG | NEG | NEG |
| | Free Water | scalar | *Visual | | NEG | NEG | NEG |
| | FLUID PROPE | | method | limit/base | current | history 1 | history 2 |
| | Visc @ 100°C | cSt | ASTM D445 | 15.4 | 13.2 | 12.7 | 13.1 |
| | GRAPHS | | | | | | |
| | Ferrous Alloys | · | | | | | |
| 1/23 | iron | \wedge | | | | | |
| Jan4/23 Apr24/23 | 20 - nickel | | | | | | |
| | 15 | 1 | \backslash | | | | |
| | udd | | | | | | |
| | 10- | | V | | | | |
| | 5- | | | | | | |
| | | | | NAME AND ADDRESS OF | | | |
| | 27 21 0 | 22 | 23 53 | 23 | | | |
| | 0ct6/21 Dec22/21 Apr15/22 | Jul11/22 Vov16/22 | Jan4/23 Apr24/23 | Jun25/23 | | | |
| | | - | , A | Ϋ́ | | | |
| | Non-ferrous Meta | | | | | | |
| | copper | | | | | | |
| | 8 - unsessesse tin | | | | | | |
| | 6 - | | | | | | |
| | udd | | | | | | |
| | 4 | | | | | | |
| | 2 | - | | | | | |
| | | | | | | | |
| | 6/21 2/21 5/22 | 1/22 - | 4/23 | 5/23 | | | |
| | 0ct6/21 Dec22/21 Apr15/22 | Jul11/22 Nov16/22 | Jan4/23 Apr24/23 | Jun25/23 | | | |
| | Viscosity @ 100° | _ | | - | Door Number | | |
| | ¹⁹ | | | 12. | Base Number | | |
| | 18 - Abnormal | | | 10. | | \wedge | |
| | 17 | | | | - | | ~ |
| | Difference Base | | | 1.8 Base Number (mg KOH/g) | 0 | | \backslash |
| | Conception 15 | | | | 0 | | |
| | | | | | 0 | | |
| | 13 - Abnormal | | \sim | Base | | | |
| | 12 - | | | 2. | | | |
| | | 22 | 23 | 1.0 | 21+ | 22 | 23+ 23+ 23+ |
| | 0ct6/21 Dec22/21 Apr15/22 | Jul11/22 Nov16/22 | Jan4/23 Apr24/23 | Jun25/23 | 0ct6/21 Dec22/21 Apr15/22 | Jul11/22 Nov16/22 | Jan4/23 · Apr24/23 · Jun25/23 · |
| | A L | , 2 | A | 7 | A L | · 2 | A ال |
| Laboratory | : WearCheck USA - | | | | 3 | | 000 0-11 |
| Sample No. Lab Number | | Received | | Jun 2023 Jul 2023 | | | 888 Baldwin |
| Lab Number Unique Number | : 05887358 · : 10537841 | Diagnos Diagnos | | an Felton | | | Pontiac, MI US 48340 |
| Test Package | | Diagnos | | | | Contact: F | Ricky Matthews |
| | contact Customer Serv | vice at 1-8 | 300-237-1369 | Э. | | | vs@aflenv.com |

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)

Certificate L2367

F:

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