

# **OIL ANALYSIS REPORT**

Sample Rating Trend



412036 Component Diesel Engine Fluid

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

SAMPLE INFORMATION method

### DIAGNOSIS Recommendation

Resample at the next service interval to monitor.

Machine Id

#### 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.

Sample Number		Client Info		GFL0092545	GFL0092533	GFL0092522
Sample Date		Client Info		03 Apr 2024	15 Feb 2024	03 Jan 2024
Machine Age	hrs	Client Info		6810	6218	5633
Oil Age	hrs	Client Info		592	614	610
Oil Changed		Client Info		Changed	Changed	Not Changd
Sample Status				NORMAL	NORMAL	NORMAL
CONTAMINATI	ON	method	limit/base	current	history1	history2
Fuel		WC Method	>3.0	<1.0	<1.0	<1.0
Water		WC Method	>0.2	NEG	NEG	NEG
Glycol		WC Method		NEG	NEG	NEG
WEAR METALS	S	method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185m	>120	9	9	10
Chromium	ppm	ASTM D5185m	>20	<1	0	<1
Nickel	ppm	ASTM D5185m	>5	2	2	<1
Titanium	ppm	ASTM D5185m	>2	<1	0	<1
Silver	ppm	ASTM D5185m	>2	0	0	0
Aluminum	ppm	ASTM D5185m	>20	2	2	2
Lead	ppm	ASTM D5185m	>40	0	0	<1
Copper	ppm	ASTM D5185m	>330	<1	<1	1
Tin	ppm	ASTM D5185m	>15	0	<1	1
Vanadium	ppm	ASTM D5185m		<1	0	0
Cadmium	ppm	ASTM D5185m		0	0	<1
ADDITIVES		method	limit/base	current	history1	history2
ADDITIVES Boron	ppm	method ASTM D5185m	limit/base	current 8	history1 3	history2 <1
ADDITIVES Boron Barium	ppm ppm	method ASTM D5185m ASTM D5185m	limit/base 0 0	current 8 0	history1 3 0	history2 <1 8
ADDITIVES Boron Barium Molybdenum	ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m	limit/base 0 0 60	current 8 0 62	history1 3 0 61	history2 <1 8 63
ADDITIVES Boron Barium Molybdenum Manganese	ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base 0 0 60 0	current 8 0 62 <1	history1 3 0 61 0	history2 <1 8 63 <1
ADDITIVES Boron Barium Molybdenum Manganese Magnesium	ppm ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base 0 0 60 0 1010	current 8 0 62 <1 1028	history1 3 0 61 0 950	history2 <1 8 63 <1 989
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium	ppm ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base 0 60 0 1010 1070	current 8 0 62 <1 1028 1201	history1 3 0 61 0 950 1069	history2 <1 8 63 <1 989 1111
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus	ppm ppm ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base 0 60 0 1010 1070 1150	current           8           0           62           <1           1028           1201           1063	history1 3 0 61 0 950 1069 1041	history2 <1 8 63 <1 989 1111 956
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc	ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base 0 60 0 1010 1070 1150 1270	current           8           0           62           <1           1028           1201           1063           1362	history1 3 0 61 0 950 1069 1041 1219	history2 <1 8 63 <1 989 11111 956 1252
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	limit/base 0 60 0 1010 1070 1150 1270 2060	current           8           0           62           <1           1028           1201           1063           1362           3774	history1         3         0         61         0         950         1069         1041         1219         2838	<1         8         63         <1         989         1111         956         1252         3023
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN	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	limit/base 0 60 0 1010 1070 1150 1270 2060 limit/base	current 8 0 62 <1 1028 1201 1063 1362 3774 current	history1 3 0 61 0 950 1069 1041 1219 2838 history1	history2 <1 8 63 <1 989 1111 956 1252 3023 history2
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon	ppm	method           ASTM D5185m	limit/base 0 0 0 1010 1070 1150 1270 2060 limit/base >25	current           8           0           62           <1           1028           1201           1063           1362           3774           current           3	history1         3         0         61         0         950         1069         1041         1219         2838         history1         4	<1         8         63         <1         989         1111         956         1252         3023         history2
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN <sup>T</sup> Silicon Sodium	ppm	method           ASTM D5185m	limit/base 0 60 0 1010 1070 1150 1270 2060 limit/base >25	current           8           0           62           <1           1028           1201           1063           1362           3774           current           3           4	history1         3         0         61         0         950         1069         1041         1219         2838         history1         4         4         4	<1         8         63         <1         989         1111         956         1252         3023         history2         4         0
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium	ppm	method           ASTM D5185m	limit/base 0 60 1010 1070 1150 1270 2060 limit/base >25 >20	current           8           0           62           <1           1028           1201           1063           1362           3774           current           3           4           3	history1         3         0         61         0         950         1069         1041         1219         2838         history1         4         4         2	<1         8         63         <1         989         1111         956         1252         3023         history2         4         0         4
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	method           ASTM D5185m	limit/base 0 60 0 1010 1070 1150 1270 2060 limit/base >25 >20	current         8         0         62         <1         1028         1201         1063         1362         3774         current         3         4         3         4         3         current	history1         3         0         61         0         950         1069         1041         1219         2838         history1         4         2         history1	<1         8         63         <1         989         1111         956         1252         3023         history2         4         0         4         0         4         history2
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot %	ppm	method           ASTM D5185m	limit/base 0 0 0 1010 1070 1150 1270 2060 limit/base >25 limit/base	current         8         0         62         <1         1028         1201         1063         1362         3774         current         3         4         3         current         0.5	history1         3         0         61         0         950         1069         1041         1219         2838         history1         4         2         history1         0.6	<1         8         63         <1         989         1111         956         1252         3023         history2         4         0         4         0.4
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % Nitration	ppm ppm ppm ppm ppm ppm ppm ppm ppm t ppm ppm	method           ASTM D5185m	limit/base 0 0 0 1010 1070 1150 1270 2060 limit/base >25 -20 limit/base >4 >20	current         8         0         62         <1         1028         1201         1063         1362         3774         current         3         4         3         current         0.5         9.0	history1         3         0         61         0         950         1069         1041         1219         2838         history1         4         2         history1         0.6         8.5	<1         8         63         <1         989         1111         956         1252         3023         history2         4         0         4         0.4         8.3
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation	ppm ppm ppm ppm ppm ppm ppm ppm ppm t ppm ppm	method           ASTM D5185m	limit/base 0 0 1010 1010 1070 1150 1270 2060 limit/base >25 	current         8         0         62         <1         1028         1201         1063         1362         3774         current         3         4         3         current         0.5         9.0         20.1	history1         3         0         61         0         950         1069         1041         1219         2838         history1         4         2         history1         0.6         8.5         20.2	<1         8         63         <1         989         1111         956         1252         3023         history2         4         0         4         0.4         8.3         19.1
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANT Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	method           ASTM D5185m           ASTM D7844           *ASTM D7624           *ASTM D7415           Method	limit/base 0 0 0 1010 1070 1150 1270 2060 limit/base >20 limit/base >4 >20 >30	current         8         0         62         <1         1028         1201         1063         1362         3774         current         3         4         3         current         0.5         9.0         20.1	history1         3         0         61         0         950         1069         1041         1219         2838         history1         4         2         history1         0.6         8.5         20.2         history1	<1         8         63         <1         989         1111         956         1252         3023         history2         4         0         4         0.4         8.3         19.1         history2
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation FLUID DEGRAD Oxidation	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	method           ASTM D5185m           ASTM D7185M           ASTM D7844           *ASTM D7624           *ASTM D7415           method           *ASTM D7414	limit/base   0   0   60   0   1010   1070   1150   1270   2060   limit/base   >20   20   limit/base   >20   20 <th>current         8         0         62         &lt;1         1028         1201         1063         3774         current         3         4         3         current         0.5         9.0         20.1         current         17.0</th> <th>history1         3         0         61         0         950         1069         1041         1219         2838         history1         4         2         history1         0.6         8.5         20.2         history1         16.7</th> <th>&lt;1         8         63         &lt;1         989         1111         956         1252         3023         history2         4         0         4         0.4         8.3         19.1         history2         16.5</th>	current         8         0         62         <1         1028         1201         1063         3774         current         3         4         3         current         0.5         9.0         20.1         current         17.0	history1         3         0         61         0         950         1069         1041         1219         2838         history1         4         2         history1         0.6         8.5         20.2         history1         16.7	<1         8         63         <1         989         1111         956         1252         3023         history2         4         0         4         0.4         8.3         19.1         history2         16.5



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VISUAL		method			history1	history2
White Metal	scalar	*Visual	NONE	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		NEG	NEG	NEG
		المحملة محمد	11		In the second	history O
FLUID PROPE	RHES	method	limit/base	current	nistory i	nistory2
Visc @ 100°C	cSt	ASTM D445	15.4	13.3	13.6	13.9
GRAPHS						

Ferrous Alloys





\* - 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)

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Submitted By: See also GFL935 - Tim Kieffer