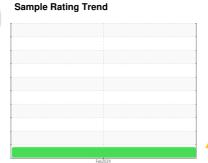


# **OIL ANALYSIS REPORT**



ISO



Machine Id 3023A Component

**Hydraulic System** 

PETRO CANADA HYDREX MV 46 (--- GAL)

## **DIAGNOSIS**

### Recommendation

The filter change at the time of sampling has been noted. We recommend an early resample to monitor this condition.

All component wear rates are normal.

## Contamination

There is a moderate amount of silt (particulates < 14 microns in size) present in the oil.

### **Fluid Condition**

The AN level is acceptable for this fluid. The oil is still serviceable provided that the contaminant(s) can be reduced to acceptable levels.

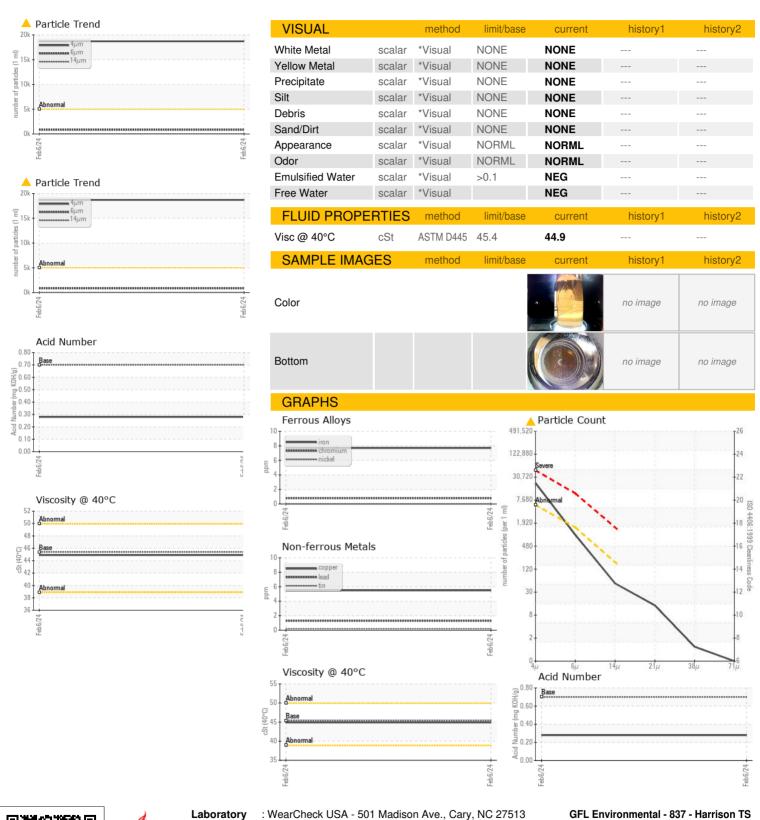
SAMPLE INFORMATION							
SAMPLE INFORMATION         method         limit/base         current         history1         history2           Sample Number         Client Info         06 Feb 2024             Sample Date         Client Info         06 Feb 2024             Machine Age         hrs         Client Info         0             Oil Changed         Client Info         Not Changd             Oil Changed Status         To method         limit/base         current         history1         history2           Water         WC Method         >0.1         NEG             WEAR METALS         method         limit/base         current         history1         history2           Water         ppm         ASTM D5185m         >10         <1		Feb.2024					
Sample Number         Client Info         GFL0108091             Sample Date         Iclient Info         06 Feb 2024             Machine Age         hrs         Client Info         0             Oil Age         hrs         Client Info         Not Changd             Oil Changed         Client Info         Not Changd             Sample Status         Image: Client Info         Not Changd             CONTAMINATION         method         limit/base         current         history1         history2           Water         WC Method         >0.1         NEG             WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185m         >10         -1             Iron         ppm         ASTM D5185m         >10         -1             Silver         ppm         ASTM D5185m         >10         -1             Capper         ppm         ASTM D5185m	SAMPLE INFOR	MATION	l method			history1	history2
Sample Date         Client Info         06 Feb 2024             Machine Age         hrs         Client Info         24283             Oil Age         hrs         Client Info         Not Changd             Oil Changed         Client Info         Not Changd             Sample Status         BRORMAL             CONTAMINATION         method         limit/base         current         history1         history2           Water         WC Method         >0.1         NEG             Uron         ppm         ASTM 05185m         >10         <1		WINTION		III III Dasc			
Machine Age         hrs         Client Info         24263            Oil Age         hrs         Client Info         0            Sample Status         Client Info         Not Changd            Sample Status         Local Client Info         ABNORMAL            CONTAMINATION         method         limit/base         current         history1         history2           Water         WC Method         >0.1         NEG             WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185m         >20         8             WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185m         >10         <1	·						
Oil Age         hrs         Client Info         Not Changd							
Oil Changed Sample Status         Client Info         Not Changd ABNORMAL							
Sample Status         Method limit/base current         history1         history2           Water         WC Method         >0.1         NEG            WEAR METALS         method limit/base         current         history1         history2           Iron         ppm         ASTM D5185m         >20         8             Chromium         ppm         ASTM D5185m         >10         <1             Nickel         ppm         ASTM D5185m         >10         0             Silver         ppm         ASTM D5185m         >10         <1             Copper         ppm         ASTM D5185m         >10         <1             Tin         ppm         ASTM D5185m         0         <1             Capper	-	nrs			-		
CONTAMINATION         method         limit/base         current         history1         history2           Water         WC Method         >0.1         NEG             WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185m         >20         8             Chromium         ppm         ASTM D5185m         >10         <1			Client Info				
Water         WC Method         >0.1         NEG            WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185m         >20         8             Chromium         ppm         ASTM D5185m         >10         <1	·				ABNORMAL		
WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185m         >20         8             Chromium         ppm         ASTM D5185m         >10         <1             Nickel         ppm         ASTM D5185m         >10         0             Titanium         ppm         ASTM D5185m         >10         <1             Silver         ppm         ASTM D5185m         >10         <1             Aluminum         ppm         ASTM D5185m         >10         <1             Lead         ppm         ASTM D5185m         >10         <1             Copper         ppm         ASTM D5185m         >10         <1             Vanadium         ppm         ASTM D5185m         0         <1             Vanadium         ppm         ASTM D5185m         0         0             Vanadium         ppm         ASTM D5185m         0	CONTAMINA	TION	method	limit/base	current	history1	history2
Iron	Water		WC Method	>0.1	NEG		
Chromium         ppm         ASTM D5185m         >10         <1	WEAR META	LS	method	limit/base	current	history1	history2
Nickel	Iron	ppm	ASTM D5185m	>20	8		
Titanium	Chromium	ppm	ASTM D5185m	>10	<1		
Silver	Nickel	ppm	ASTM D5185m	>10	0		
Aluminum ppm ASTM D5185m >10 <1	Titanium	ppm	ASTM D5185m		<1		
Lead         ppm         ASTM D5185m         >10         1             Copper         ppm         ASTM D5185m         >75         6             Tin         ppm         ASTM D5185m         >10         <1	Silver	ppm	ASTM D5185m		0		
Copper         ppm         ASTM D5185m         >75         6             Tin         ppm         ASTM D5185m         >10         <1	Aluminum	ppm	ASTM D5185m	>10	<1		
Tin ppm ASTM D5185m >10 <1	Lead	ppm	ASTM D5185m	>10	1		
Vanadium         ppm         ASTM D5185m         0             ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         0             Barium         ppm         ASTM D5185m         0         0             Molybdenum         ppm         ASTM D5185m         0         2             Manganese         ppm         ASTM D5185m         0         23             Magnesium         ppm         ASTM D5185m         0         23             Calcium         ppm         ASTM D5185m         50         106             Phosphorus         ppm         ASTM D5185m         50         106             Phosphorus         ppm         ASTM D5185m         330         358             Zinc         ppm         ASTM D5185m         430         472             Sulfur         ppm         ASTM D5185m         >20         2	Copper	ppm	ASTM D5185m	>75	6		
Cadmium         ppm         ASTM D5185m         0             ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         0             Barium         ppm         ASTM D5185m         0         2             Molybdenum         ppm         ASTM D5185m         0         2             Magnese         ppm         ASTM D5185m         0         23             Magnesium         ppm         ASTM D5185m         50         106             Magnesium         ppm         ASTM D5185m         50         106             Magnesium         ppm         ASTM D5185m         50         106             Phosphorus         ppm         ASTM D5185m         50         106             Sulfur         ppm         ASTM D5185m         430         472             Sulfur         ppm         ASTM D5185m         >20         2 <td>Tin</td> <td>ppm</td> <td>ASTM D5185m</td> <td>&gt;10</td> <td>&lt;1</td> <td></td> <td></td>	Tin	ppm	ASTM D5185m	>10	<1		
ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         0             Barium         ppm         ASTM D5185m         0         0             Molybdenum         ppm         ASTM D5185m         0         2             Manganese         ppm         ASTM D5185m         1         <1	Vanadium	ppm	ASTM D5185m		0		
Boron         ppm         ASTM D5185m         0         0             Barium         ppm         ASTM D5185m         0         0             Molybdenum         ppm         ASTM D5185m         0         2             Manganese         ppm         ASTM D5185m         1         <1             Magnesium         ppm         ASTM D5185m         0         23             Magnesium         ppm         ASTM D5185m         50         106             Phosphorus         ppm         ASTM D5185m         30         358             Zinc         ppm         ASTM D5185m         430         472             Sulfur         ppm         ASTM D5185m         760         1013             CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >20         2             Sodium         ppm         ASTM D5185m         >20 </td <td>Cadmium</td> <td>ppm</td> <td>ASTM D5185m</td> <td></td> <td>0</td> <td></td> <td></td>	Cadmium	ppm	ASTM D5185m		0		
Barium         ppm         ASTM D5185m         0         0             Molybdenum         ppm         ASTM D5185m         0         2             Manganese         ppm         ASTM D5185m         1         <1             Magnesium         ppm         ASTM D5185m         50         106             Phosphorus         ppm         ASTM D5185m         330         358             Zinc         ppm         ASTM D5185m         430         472             Sulfur         ppm         ASTM D5185m         760         1013             CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >20         2             Sodium         ppm         ASTM D5185m         >20         3             Potassium         pm         ASTM D5185m         >20         3             FLUID CLEANLINESS         method         limit/base	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum         ppm         ASTM D5185m         0         2             Manganese         ppm         ASTM D5185m         1         <1	Boron	ppm	ASTM D5185m	0	0		
Manganese         ppm         ASTM D5185m         1         <1             Magnesium         ppm         ASTM D5185m         0         23             Calcium         ppm         ASTM D5185m         50         106             Phosphorus         ppm         ASTM D5185m         330         358             Zinc         ppm         ASTM D5185m         430         472             Sulfur         ppm         ASTM D5185m         760         1013             CONTAMINANTS         method         limit/base         current         history1         history2           Solium         ppm         ASTM D5185m         >20         2             Sodium         ppm         ASTM D5185m         >20         3             Potassium         ppm         ASTM D5185m         >20         3             FLUID CLEANLINESS         method         limit/base         current         history1         history2           Particles >4µm         ASTM D7647<	Barium	ppm	ASTM D5185m	0	0		
Magnesium         ppm         ASTM D5185m         0         23             Calcium         ppm         ASTM D5185m         50         106             Phosphorus         ppm         ASTM D5185m         330         358             Zinc         ppm         ASTM D5185m         430         472             Sulfur         ppm         ASTM D5185m         760         1013             CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >20         2             Sodium         ppm         ASTM D5185m         >20         3             Potassium         ppm         ASTM D5185m         >20         3             FLUID CLEANLINESS         method         limit/base         current         history1         history2           Particles >4µm         ASTM D7647         >5000         18705             Particles >14µm         ASTM D7	Molybdenum	ppm	ASTM D5185m	0	2		
Calcium         ppm         ASTM D5185m         50         106             Phosphorus         ppm         ASTM D5185m         330         358             Zinc         ppm         ASTM D5185m         430         472             Sulfur         ppm         ASTM D5185m         760         1013             CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >20         2             Sodium         ppm         ASTM D5185m         >20         3             Potassium         ppm         ASTM D5185m         >20         3             FLUID CLEANLINESS         method         limit/base         current         history1         history2           Particles >4μm         ASTM D7647         >5000         18705             Particles >6μm         ASTM D7647         >1300         835             Particles >21μm         ASTM D7647	Manganese	ppm	ASTM D5185m	1	<1		
Phosphorus         ppm         ASTM D5185m         330         358             Zinc         ppm         ASTM D5185m         430         472             Sulfur         ppm         ASTM D5185m         760         1013             CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >20         2             Sodium         ppm         ASTM D5185m         >20         3             Potassium         ppm         ASTM D5185m         >20         3             FLUID CLEANLINESS         method         limit/base         current         history1         history2           Particles >4μm         ASTM D7647         >5000         18705             Particles >6μm         ASTM D7647         >1300         835             Particles >14μm         ASTM D7647         >40         12             Particles >38μm         ASTM D7647         >3         0	Magnesium	ppm	ASTM D5185m	0	23		
Zinc         ppm         ASTM D5185m         430         472             Sulfur         ppm         ASTM D5185m         760         1013             CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >20         2             Sodium         ppm         ASTM D5185m         >20         3             Potassium         ppm         ASTM D5185m         >20         3             FLUID CLEANLINESS         method         limit/base         current         history1         history2           Particles >4μm         ASTM D7647         >5000         18705             Particles >6μm         ASTM D7647         >1300         835             Particles >14μm         ASTM D7647         >40         12             Particles >21μm         ASTM D7647         >10         1             Particles >71μm         ASTM D7647         >3         0	Calcium	ppm	ASTM D5185m	50	106		
Sulfur         ppm         ASTM D5185m         760         1013             CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >20         2             Sodium         ppm         ASTM D5185m         >20         3             Potassium         ppm         ASTM D5185m         >20         3             FLUID CLEANLINESS         method         limit/base         current         history1         history2           Particles >4μm         ASTM D7647         >5000         18705             Particles >6μm         ASTM D7647         >1300         835             Particles >14μm         ASTM D7647         >160         45             Particles >21μm         ASTM D7647         >40         12             Particles >38μm         ASTM D7647         >3         0             Particles >71μm         ASTM D7647         >3         0	Phosphorus	ppm	ASTM D5185m	330	358		
CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >20         2             Sodium         ppm         ASTM D5185m         4             Potassium         ppm         ASTM D5185m         >20         3            FLUID CLEANLINESS         method         limit/base         current         history1         history2           Particles >4μm         ASTM D7647         >5000         18705             Particles >6μm         ASTM D7647         >1300         835             Particles >14μm         ASTM D7647         >160         45             Particles >21μm         ASTM D7647         >40         12             Particles >71μm         ASTM D7647         >3         0             Oil Cleanliness         ISO 4406 (c)         >19/17/14         21/17/13	Zinc	ppm	ASTM D5185m	430	472		
Silicon       ppm       ASTM D5185m       >20       2           Sodium       ppm       ASTM D5185m       4            Potassium       ppm       ASTM D5185m       >20       3           FLUID CLEANLINESS method limit/base current       history1       history2         Particles >4μm       ASTM D7647       >5000       18705           Particles >6μm       ASTM D7647       >1300       835           Particles >14μm       ASTM D7647       >160       45           Particles >21μm       ASTM D7647       >40       12           Particles >38μm       ASTM D7647       >10       1           Particles >71μm       ASTM D7647       >3       0           Oil Cleanliness       ISO 4406 (c)       >19/17/14       21/17/13	Sulfur	ppm	ASTM D5185m	760	1013		
Sodium         ppm         ASTM D5185m         4             Potassium         ppm         ASTM D5185m         >20         3             FLUID CLEANLINESS         method         limit/base         current         history1         history2           Particles >4μm         ASTM D7647         >5000         18705             Particles >6μm         ASTM D7647         >1300         835             Particles >14μm         ASTM D7647         >160         45             Particles >21μm         ASTM D7647         >40         12             Particles >38μm         ASTM D7647         >10         1             Particles >71μm         ASTM D7647         >3         0             Oil Cleanliness         ISO 4406 (c)         >19/17/14         21/17/13	CONTAMINA	NTS	method	limit/base	current	history1	history2
Potassium         ppm         ASTM D5185m         >20         3             FLUID CLEANLINESS method limit/base current         history1         history2           Particles >4μm         ASTM D7647         >5000         ▲ 18705             Particles >6μm         ASTM D7647         >1300         835             Particles >14μm         ASTM D7647         >160         45             Particles >21μm         ASTM D7647         >40         12             Particles >38μm         ASTM D7647         >10         1             Particles >71μm         ASTM D7647         >3         0             Oil Cleanliness         ISO 4406 (c)         >19/17/14         21/17/13	Silicon	ppm	ASTM D5185m	>20	2		
FLUID CLEANLINESS method         limit/base         current         history1         history2           Particles >4μm         ASTM D7647         >5000         ▲ 18705             Particles >6μm         ASTM D7647         >1300         835             Particles >14μm         ASTM D7647         >160         45             Particles >21μm         ASTM D7647         >40         12             Particles >38μm         ASTM D7647         >10         1             Particles >71μm         ASTM D7647         >3         0             Oil Cleanliness         ISO 4406 (c)         >19/17/14         21/17/13	Sodium	ppm	ASTM D5185m		4		
Particles >4μm       ASTM D7647       >5000       18705           Particles >6μm       ASTM D7647       >1300       835           Particles >14μm       ASTM D7647       >160       45           Particles >21μm       ASTM D7647       >40       12           Particles >38μm       ASTM D7647       >10       1           Particles >71μm       ASTM D7647       >3       0           Oil Cleanliness       ISO 4406 (c)       >19/17/14       21/17/13	Potassium	ppm	ASTM D5185m	>20	3		
Particles >6μm       ASTM D7647       >1300       835           Particles >14μm       ASTM D7647       >160       45           Particles >21μm       ASTM D7647       >40       12           Particles >38μm       ASTM D7647       >10       1           Particles >71μm       ASTM D7647       >3       0           Oil Cleanliness       ISO 4406 (c)       >19/17/14       21/17/13	FLUID CLEAN	ILINESS	method	limit/base	current	history1	history2
Particles >14μm       ASTM D7647       >160       45           Particles >21μm       ASTM D7647       >40       12           Particles >38μm       ASTM D7647       >10       1           Particles >71μm       ASTM D7647       >3       0           Oil Cleanliness       ISO 4406 (c)       >19/17/14       21/17/13	Particles >4µm		ASTM D7647	>5000	<b>18705</b>		
Particles >21μm       ASTM D7647       >40       12           Particles >38μm       ASTM D7647       >10       1           Particles >71μm       ASTM D7647       >3       0           Oil Cleanliness       ISO 4406 (c)       >19/17/14       ▲ 21/17/13			ASTM D7647	>1300	835		
Particles >38μm       ASTM D7647       >10       1           Particles >71μm       ASTM D7647       >3       0           Oil Cleanliness       ISO 4406 (c)       >19/17/14 $\triangle$ 21/17/13	Particles >14µm		ASTM D7647	>160	45		
Particles >71μm       ASTM D7647       >3       0           Oil Cleanliness       ISO 4406 (c)       >19/17/14       ▲ 21/17/13	Particles >21µm		ASTM D7647	>40	12		
Particles >71μm       ASTM D7647       >3       0           Oil Cleanliness       ISO 4406 (c)       >19/17/14       ▲ 21/17/13	Particles >38µm		ASTM D7647	>10	1		
· /	Particles >71µm		ASTM D7647	>3	0		
FLUID DEGRADATION method limit/base current history1 history2	Oil Cleanliness		ISO 4406 (c)	>19/17/14	<u>21/17/13</u>		
	ELLUD DEODA						

Acid Number (AN)

0.28



# **OIL ANALYSIS REPORT**







Laboratory Sample No. Lab Number

: GFL0108091 : 06088116

Unique Number: 10875561

Diagnosed

Test Package: FLEET (Additional Tests: PrtCount) 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.

Received

**Tested** 

: 13 Feb 2024

: 14 Feb 2024

: 14 Feb 2024 - Wes Davis

GFL Environmental - 837 - Harrison TS

22820 S State Route 291

Harrisonville, MO US 64701

Contact: JEREMY BROWN

jeremyb@gflenv.com

T: F:

Statements of conformity to specifications are based on the simple acceptance decision rule (JCGM 106:2012)