

# **PROBLEM SUMMARY**

Machine Id

# #2 SCHWING (S/N 133768)

**Circulating Hydraulic System** PETRO CANADA HYDREX AW 46 (--- LTR)

# COMPONENT CONDITION SUMMARY



#### Non-ferrous Metals

Sample Rating Trend



ISO

# RECOMMENDATION

The component was not specified, however we determined the component was a hydraulic system based on the type of fluid used. Please specify component type with your next sample. Check seals and/or filters for points of contaminant entry. The air breather requires service. If unrated, we recommend that you replace with a suitable micron rated and/or desiccant air breather. If rated, we recommend that you service/replace the breather. We recommend you service the filters on this component. Resample in 30-45 days to monitor this situation. NOTE: Please provide information regarding reservoir capacity, filter type and micron rating with next sample.

# PROBLEMATIC TEST RESULTS

Sample Status				SEVERE	ATTENTION	ABNORMAL
Copper	ppm	ASTM D5185(m)	>20	<u> </u>	47	15
Particles >4µm		ASTM D7647	>5000	<b>&amp;</b> 82792	9686	<b>2</b> 6977
Particles >6µm		ASTM D7647	>1300	<b>10930</b>	622	<u> </u>
Oil Cleanliness		ISO 4406 (c)	>19/17/14	<b>4</b> 24/21/14	20/16/12	🔺 22/19/15

Customer Id: ONT130MIS Sample No.: PC0058422 Lab Number: 02647808 Test Package: IND 2



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To discuss the diagnosis or test data: Kevin Marson +1 (289)291-4644 x4644 Kevin.Marson@wearcheck.com

To change component or sample information: Gloria Gonzalez +1 (289)291-4643 x4643 gloria.gonzalez@wearcheck.com

RECOMMENDED	ACTIONS	;		
Action	Status	Date	Done By	Description
Change Filter			?	We recommend you service the filters on this component.
Resample			?	Resample in 30-45 days to monitor this situation.
Alert			?	The component was not specified, however we determined the component was a hydraulic system based on the type of fluid used. Please specify component type with your next sample.
Information Required			?	NOTE: Please provide information regarding reservoir capacity, filter type and micron rating with next sample.
Check Breathers			?	The air breather requires service. If unrated, we recommend that you replace with a suitable micron rated and/or desiccant air breather. If rated, we recommend that you service/replace the breather.
Check Seals			?	Check seals and/or filters for points of contaminant entry.

## HISTORICAL DIAGNOSIS

#### 06 Jul 2022 Diag: Kevin Marson

We recommend you service the filters on this component. Resample at the next service interval to monitor.Copper ppm levels are noted. All other component wear rates are normal. There is a light amount of silt (particulates < 14 microns in size) present in the oil. The AN level is acceptable for this fluid. The condition of the oil is suitable for further service.



#### 05 Mar 2018 Diag: Kevin Marson

Little or no information is provided as to the component and lubricant being tested. Recommendations are therefore generic in nature and may not apply to the current application. Please forward information as to equipment type, reservoir capacity, lubricant type and any pertinent information to allow for a more accurate assessment. We recommend you service the filters on this component. We recommend an early resample to monitor this condition. NOTE: Please provide information regarding reservoir capacity, filter type and micron rating with next sample.All component wear rates are normal. Particles >4µm are abnormally high. Particles >6µm are abnormally high. Particles >14µm are notably high. The AN level is acceptable for this fluid. The condition of the sample is suitable for further service. The sample is still serviceable provided that the contaminant(s) can be reduced to acceptable levels.





# **OIL ANALYSIS REPORT**

Sample Rating Trend

ISO

Machine Id

# #2 SCHWING (S/N 133768)

Circulating Hydraulic System Fluid PETRO CANADA HYDREX AW 46 (--- LTR)

# DIAGNOSIS

## Recommendation

The component was not specified, however we determined the component was a hydraulic system based on the type of fluid used. Please specify component type with your next sample. Check seals and/or filters for points of contaminant entry. The air breather requires service. If unrated, we recommend that you replace with a suitable micron rated and/or desiccant air breather. If rated, we recommend that you service/replace the breather. We recommend you service the filters on this component. Resample in 30-45 days to monitor this situation. NOTE: Please provide information regarding reservoir capacity, filter type and micron rating with next sample.

# 🔺 Wear

Copper ppm levels are abnormal. Oil cooler core leaching or motor piston wear is indicated.

## Contamination

There is a high 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 no longer serviceable as a result of the abnormal and/or severe wear.

SAMPLE INFORI	MATION	method	limit/base	current	history1	history2
Sample Number		Client Info		PC0058422	PC0058223	PC383496
Sample Date		Client Info		09 Jul 2024	06 Jul 2022	05 Mar 2018
Machine Age	hrs	Client Info		7322	1247	12379
Oil Age	hrs	Client Info		0	0	0
Oil Changed		Client Info		Not Changd	Not Changd	Not Changd
Sample Status				SEVERE	ATTENTION	ABNORMAL
CONTAMINAT	ION	method	limit/base	current	history1	history2
Water		WC Method	>0.05	NEG	NEG	NEG
WEAR METAL	S	method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185(m)	>20	5	<1	1
Chromium	ppm	ASTM D5185(m)	>20	3	<1	3
Nickel	ppm	ASTM D5185(m)	>20	<1	0	<1
Titanium	ppm	ASTM D5185(m)		0	0	0
Silver	ppm	ASTM D5185(m)		0	0	0
Aluminum	ppm	ASTM D5185(m)	>20	<1	<1	<1
Lead	ppm	ASTM D5185(m)	>20	4	4	1
Copper	ppm	ASTM D5185(m)	>20	<u> </u>	47	15
Tin	ppm	ASTM D5185(m)	>20	1	<1	<1
Antimony	ppm	ASTM D5185(m)		0	0	0
Vanadium	ppm	ASTM D5185(m)		0	0	0
Beryllium	ppm	ASTM D5185(m)		0	0	0
Cadmium	ppm	ASTM D5185(m)		0	0	0
ADDITIVES		method	limit/base	current	history1	history2
ADDITIVES Boron	ppm	method ASTM D5185(m)	limit/base 0	current 0	history1 0	history2 <1
ADDITIVES Boron Barium	ppm ppm	method ASTM D5185(m) ASTM D5185(m)	limit/base 0 0	current 0 0	history1 0 0	history2 <1 0
ADDITIVES Boron Barium Molybdenum	ppm ppm ppm	Method ASTM D5185(m) ASTM D5185(m) ASTM D5185(m)	limit/base 0 0 0	current 0 0 0	history1 0 0 0	history2 <1 0 0
ADDITIVES Boron Barium Molybdenum Manganese	ppm ppm ppm ppm	methodASTM D5185(m)ASTM D5185(m)ASTM D5185(m)ASTM D5185(m)	limit/base 0 0 0 0	current 0 0 0 0	history1 0 0 0 0	history2 <1 0 0 0
ADDITIVES Boron Barium Molybdenum Manganese Magnesium	ppm ppm ppm ppm ppm	methodASTM D5185(m)ASTM D5185(m)ASTM D5185(m)ASTM D5185(m)ASTM D5185(m)	limit/base 0 0 0 0 0	Current 0 0 0 0 <1	history1 0 0 0 0 0 0	history2 <1 0 0 0 <1
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium	ppm ppm ppm ppm ppm	method           ASTM D5185(m)	limit/base 0 0 0 0 0 0 50	current           0           0           0           0           0           2           1           51	history1 0 0 0 0 0 0 49	history2           <1           0           0           0           0           53
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus	ppm ppm ppm ppm ppm ppm	method           ASTM D5185(m)	limit/base 0 0 0 0 0 0 50 330	Current 0 0 0 0 <1 51 322	history1 0 0 0 0 0 0 49 311	history2 <1 0 0 0 <1 53 331
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc	ppm ppm ppm ppm ppm ppm ppm	method           ASTM D5185(m)	limit/base 0 0 0 0 0 0 5 0 5 0 3 3 0 4 30	current           0           0           0           0           1           51           322           376	history1 0 0 0 0 0 0 49 311 392	<1         0         0         0         0         331         429
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur	ppm ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m)	limit/base 0 0 0 0 0 50 330 430 760	Current 0 0 0 <1 51 322 376 809	history1 0 0 0 0 0 0 49 311 392 809	history2 <1 0 0 0 <1 53 331 429 723
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium	ppm ppm ppm ppm ppm ppm ppm ppm	method           ASTM D5185(m)	limit/base 0 0 0 0 50 330 430 760	Current 0 0 0 <1 51 322 376 809 <1	history1         0         0         0         0         0         0         311         392         809         <1	<1         0         0         0         0         331         429         723         <1
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium CONTAMINAN	ppm ppm ppm ppm ppm ppm ppm ppm ppm	method           ASTM D5185(m)	limit/base 0 0 0 0 5 0 5 0 3 3 0 4 3 0 4 3 0 7 6 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	current         0         0         0         0         -         51         322         376         809         <1         -	history1         0         0         0         0         0         0         0         311         392         809         <1         history1	<1         0         0         0         0         1         53         331         429         723         <1         history2
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium CONTAMINAN Silicon	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	method           ASTM D5185(m)	limit/base 0 0 0 0 5 0 5 0 3 3 0 4 3 0 4 3 0 4 3 0 4 3 0 7 6 0 5 7 6 0 5 7 6 0 5 7 6 7 5 7 6 7 7 7 7 7 7 7 7 7 7 7 7 7	current           0           0           0           0           2           376           809           <1           current	history1         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         49         311         392         809         <1	<1         0         0         0         0         1         53         331         429         723         <1         history2
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium CONTAMINAN Silicon Sodium	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	method           ASTM D5185(m)	limit/base 0 0 0 0 50 330 430 760 2 1 1 1 1 1 5 2 1 5	current           0           0           0           0           1           376           809           <1           turrent           1           0	history1         0         0         0         0         0         0         311         392         809         <1         history1         <1         0	<1         0         0         0         0         0         <1         53         331         429         723         <1         history2         <1         <1         <1         <1
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium CONTAMINAN Silicon Sodium Potassium	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	method           ASTM D5185(m)	limit/base 0 0 0 0 0 5 0 5 0 3 3 0 4 3 0 4 3 0 4 3 0 4 3 0 4 3 0 4 3 0 4 3 0 4 3 0 4 3 0 4 3 0 4 3 0 5 0 5 0 5 0 5 0 5 0 5 0 5 0 5 0 5 0	current         0         0         0         0         -         51         322         376         809         <1         current         1         0         0         0         0         0         0         0         0	history1         0         0         0         0         0         0         311         392         809         <1         history1         <1         0         0         0         0         0         0         0         0         0         0	<1         0         0         0         0         0         <1         53         331         429         723         <1         history2         <1         0         <1         <1         0
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium CONTAMINAN Silicon Sodium Potassium FLUID CLEANI	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	method           ASTM D5185(m)	limit/base 0 0 0 0 50 330 430 760 limit/base >20 limit/base	current         0         0         0         0         -1         51         322         376         809         <1         current         1         0         0         0         0         0         current	history1         0         0         0         0         0         311         392         809         <1         history1         <1         0         0         0         history1	<1         0         0         0         0         <1         53         331         429         723         <1         history2         <1         0         <10         history2         <1         <1         0         history2
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium CONTAMINAN Silicon Sodium Potassium FLUID CLEANI Particles >4µm	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	method           ASTM D5185(m)	limit/base 0 0 0 0 50 330 430 760 1 2 1 5 5 5 1 1 1 1 1 1 1 1 1 1 1 1 1	Current         0         0         0         0            51         322         376         809         <1            1         0         0         0         0         0         0         0         0         2         0      <	history1         0         0         0         0         0         0         311         392         809         <1         history1         <1         0         0         0         0         0         0         0         9686	<1         0         0         0         0         <1         53         331         429         723         <1         history2         <1         0         history2         <2         0         bistory2         26977
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium CONTAMINAN Silicon Sodium Potassium FLUID CLEANI Particles >4µm Particles >6µm	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	method           ASTM D5185(m)	limit/base 0 0 0 0 5 5 3 3 3 3 3 3 3 3 3 3 3 3 3	Current         0         0         0         0         0         <1         322         376         809         <1         0urrent         0 <th>history1         0         0         0         0         0         311         392         809         &lt;1         history1         &lt;1         0     <!--</th--><th>&lt;1         0         0         0         0         &lt;1         53         331         429         723         &lt;1         history2         &lt;1         0         &lt;1         history2         &lt;1         0         bistory2         &lt;26977         3953</th></th>	history1         0         0         0         0         0         311         392         809         <1         history1         <1         0 </th <th>&lt;1         0         0         0         0         &lt;1         53         331         429         723         &lt;1         history2         &lt;1         0         &lt;1         history2         &lt;1         0         bistory2         &lt;26977         3953</th>	<1         0         0         0         0         <1         53         331         429         723         <1         history2         <1         0         <1         history2         <1         0         bistory2         <26977         3953
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium CONTAMINAN Silicon Sodium Potassium FLUID CLEANI Particles >4µm Particles >6µm Particles >14µm	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	method           ASTM D5185(m)           ASTM D7647           ASTM D7647           ASTM D7647	limit/base 0 0 0 0 50 330 430 430 760 1 515 515 520 limit/base >20 limit/base >5000 >1300 >160	Current         0         0         0         0         -         51         322         376         809         <1         0         0         0            0	history1         0         0         0         0         0         0         311         392         809         <1         history1         <1         0 </th <th>&lt;1         0         0         0         0         &lt;1         53         331         429         723         &lt;1         history2         &lt;1         &lt;1         &lt;1         &lt;10         history2         &lt;1         &lt;21         &lt;1         0         1         &lt;26977         3953         177</th>	<1         0         0         0         0         <1         53         331         429         723         <1         history2         <1         <1         <1         <10         history2         <1         <21         <1         0         1         <26977         3953         177
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium CONTAMINAN Silicon Sodium Potassium FLUID CLEANI Particles >4µm Particles >14µm Particles >21µm	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	method           ASTM D5185(m)           ASTM D7647           ASTM D7647           ASTM D7647           ASTM D7647           ASTM D7647           ASTM D7647	limit/base   0   0   0   0   50   330   430   760   >15   >20   limit/base   >20   limit/base   >5000   >1300   >160   >40	Current         0         0         0         0         <1         51         322         376         809         <1         0         <10         Current         1         0         0         0         0         0         0         0         0         11         0         0         0         0         11         0         0         0         0         0         0         0         11         0         0         0         0         0         0         0         0         0         0         0         0         10         10         10         10          10          10 <th>history1         0         0         0         0         0         0         311         392         809         &lt;1         history1         &lt;10         0         0         0         0         0         0         0         0         0         0         0         0         0         0         5         622         35         8</th> <th>&lt;1         0         0         0         0         1         53         331         429         723         &lt;1         bistory2         &lt;1         &lt;1         &lt;1         &lt;1         &lt;1         &lt;1         &lt;1         &lt;1         &lt;1         &lt;21         &lt;1         &lt;1         &lt;1         &lt;1         0         bistory2         177         43</th>	history1         0         0         0         0         0         0         311         392         809         <1         history1         <10         0         0         0         0         0         0         0         0         0         0         0         0         0         0         5         622         35         8	<1         0         0         0         0         1         53         331         429         723         <1         bistory2         <1         <1         <1         <1         <1         <1         <1         <1         <1         <21         <1         <1         <1         <1         0         bistory2         177         43
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium CONTAMINAN Silicon Sodium Potassium FLUID CLEANI Particles >4µm Particles >14µm Particles >21µm Particles >38µm	ppm ppm ppm ppm ppm ppm ppm ppm <b>TS</b> ppm ppm <b>INESS</b>	method           ASTM D5185(m)           ASTM D7647           ASTM D7647           ASTM D7647           ASTM D7647           ASTM D7647	limit/base 0 0 0 0 5 5 3 3 3 3 3 3 4 3 3 4 3 0 4 3 1 5 5 5 1 5 5 5 1 5 5 5 5 0 0 5 5 5 5 0 0 5 5 5 5 0 0 5 5 5 5 0 0 5 5 5 5 0 0 5 5 5 5 0 0 5 5 5 5 5 5 5 5 5 5 5 5 5	Current         0         0         0         0         <1         51         322         376         809         <1         0         <10         0         <10         0         0         0         0         0         0         0         0         0         0         1         0         0         1         0         0         1         0         0         1         0         1         0         0         1         0         0         0         0         0         0         0         0         0         10         10         10         10         10         10         10	history1         0         0         0         0         0         311         392         809         <1         0         0         <10         0         <100         0         0         0         0         0         0         0         0         0         0         0         0         35         8         1	<1         0         0         0         0         1         53         331         429         723         <1         /1         /1         /23         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         0            177         43         0
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium CONTAMINAN Silicon Sodium Potassium FLUID CLEANI Particles >4µm Particles >6µm Particles >21µm Particles >38µm Particles >71µm	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	method           ASTM D5185(m)           ASTM D7647           A	limit/base   0   0   0   0   50   330   430   760   20   limit/base   >15   >20   limit/base   >5000   >1300   >160   >40   >10   >3	Current         0         0         0         0         0            51         322         376         809         <1         0            1         0         0         0         0         0         0         0         0         0         11         0         0         0         11         0         0         0         11         0         0         0         11         0         0         0         11         02         110930         91         16         2         1         1         1         1         1         1         16         2         1	history1         0         0         0         0         0         311         392         809         <1         <1         0         0         <1         0         <1         0         <1         0         <1         0         0         bistory1         <1         0         5         8         1         1	<1         0         0         0         0         0         <1         53         331         429         723         <1         /1         history2         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         0         history2         ▲ 26977         ▲ 3953         177         43         0         0         0         0         0

Report Id: ONT130MIS [WCAMIS] 02647808 (Generated: 07/16/2024 09:53:18) Rev: 1

Contact/Location: Angelo Magnifico - ONT130MIS



Particle Count

Particle Trend

🔺 Non-ferrous Metals

144

214

491,520 122,88

Ê 30,720 7 68

480

120 30 8

100 Ē 80

of particles 60 40ł 20 Ok Mar5/

> > 10 0 Mar5/18

number of particles (per 1 1.92

# **OIL ANALYSIS REPORT**

FLUID DEGRA		method	limit/base	current	history1	history
Acid Number (AN)	mg KOH/g	ASTM D974*	0.70	0.42	0.27	0.415
VISUAL		method	limit/base	current	history1	history
White Metal	scalar	Visual*	NONE	VLITE	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	VLITE
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*	>0.05	NEG	NEG	NEG
Free Water	scalar	Visual*		NEG	NEG	NEG
FLUID PROPE	RTIES	method	limit/base	current	history1	history
Visc @ 40°C	cSt	ASTM D7279(m)	46.4	45.8	46.0	46.3
Visc @ 100°C	cSt	ASTM D7279(m)	6.92	7.3	7.3	6.9
Viscosity Index (VI)	Scale	ASTM D2270*	104	121	120	104
SAMPLE IMAG	iES	method	limit/base	current	history1	history
Color						

.24

20

18

16 14

384

Bottom







Report Id: ONT130MIS [WCAMIS] 02647808 (Generated: 07/16/2024 09:53:18) Rev: 1

Contact/Location: Angelo Magnifico - ONT130MIS