

## **OIL ANALYSIS REPORT**

## Area 2H28 Machine Io KENWORTH T800 TCK8728 (S/N 1XKDP4EX2EJ405521)

Diesel Engine

Fluid DIESEL ENGINE OIL SAE 15W40 (--- GAL)

#### DIAGNOSIS

### Recommendation

No corrective action is recommended at this time. Resample at the next service interval to monitor.

## Wear

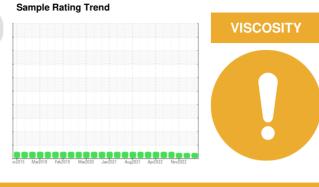
All component wear rates are normal.

#### Contamination

There is no indication of any contamination in the oil.

## Fluid Condition

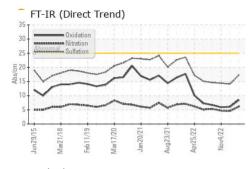
The oil viscosity is lower than normal. The BN result indicates that there is suitable alkalinity remaining in the oil. Confirm oil type.

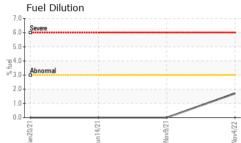


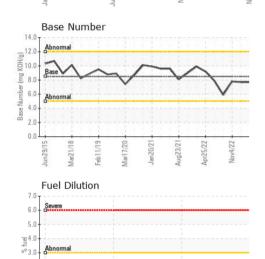
SAMPLE INFORM	ΛΑΤΙΟΝ	method	limit/base	current	history1	history2
Sample Number		Client Info		ARI06147019	ARI0004247	ARI0004311
Sample Date		Client Info		11 Apr 2024	05 Jan 2023	04 Nov 2022
Machine Age	mls	Client Info		251238	219907	216240
Oil Age	mls	Client Info		0	0	0
Oil Changed	1110	Client Info		N/A	N/A	N/A
Sample Status				ATTENTION	ATTENTION	ATTENTION
· ·					-	
CONTAMINATIO	N	method	limit/base	current	history1	history2
Water		WC Method	>0.2	NEG	NEG	NEG
Glycol		WC Method		NEG	NEG	NEG
WEAR METALS		method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185m	>90	10	5	4
Chromium	ppm	ASTM D5185m	>20	0	<1	0
Nickel	ppm	ASTM D5185m	>2	0	<1	<1
Titanium	ppm	ASTM D5185m	>2	0	0	0
Silver	ppm	ASTM D5185m	>2	0	0	0
Aluminum	ppm	ASTM D5185m	>20	<1	<1	0
Lead	ppm	ASTM D5185m	>40	0	<1	<1
Copper	ppm	ASTM D5185m	>330	0	<1	1
Tin	ppm	ASTM D5185m	>15	0	0	0
Vanadium	ppm	ASTM D5185m		0	0	0
Cadmium	ppm	ASTM D5185m		0	0	0
ADDITIVES		method	limit/base	current	history1	history2
Boron	mqq	ASTM D5185m	250	45	37	26
Boron Barium	ppm pom			-	37 0	26 0
Barium	ppm	ASTM D5185m ASTM D5185m ASTM D5185m	10	0	0	0
Barium Molybdenum	ppm ppm	ASTM D5185m ASTM D5185m		0 50	0 27	0 26
Barium Molybdenum Manganese	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	10 100	0 50 0	0 27 0	0
Barium Molybdenum Manganese Magnesium	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	10 100 450	0 50 0 151	0 27 0 106	0 26 0 100
Barium Molybdenum Manganese Magnesium Calcium	ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	10 100 450 3000	0 50 0 151 2490	0 27 0 106 2200	0 26 0 100 2040
Barium Molybdenum Manganese Magnesium Calcium Phosphorus	ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	10 100 450 3000 1150	0 50 0 151 2490 1053	0 27 0 106 2200 865	0 26 0 100 2040 862
Barium Molybdenum Manganese Magnesium Calcium	ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	10 100 450 3000	0 50 0 151 2490	0 27 0 106 2200	0 26 0 100 2040
Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc	ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	10 100 450 3000 1150 1350	0 50 0 151 2490 1053 1190	0 27 0 106 2200 865 1016	0 26 0 100 2040 862 999
Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur	ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	10 100 450 3000 1150 1350 4250 limit/base	0 50 0 151 2490 1053 1190 4246	0 27 0 106 2200 865 1016 3193 history1	0 26 0 100 2040 862 999 2854
Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS	ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	10 100 450 3000 1150 1350 4250 limit/base	0 50 0 151 2490 1053 1190 4246 current	0 27 0 106 2200 865 1016 3193	0 26 0 100 2040 862 999 2854 history2
Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium	ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	10 100 450 3000 1150 1350 4250 <b>limit/base</b> >25	0 50 0 151 2490 1053 1190 4246 current 6	0 27 0 106 2200 865 1016 3193 history1 5	0 26 0 100 2040 862 999 2854 history2 7
Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon	ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m <b>method</b> ASTM D5185m	10 100 450 3000 1150 1350 4250 <b>limit/base</b> >25 >158	0 50 0 151 2490 1053 1190 4246 current 6 2	0 27 0 106 2200 865 1016 3193 history1 5 1	0 26 0 100 2040 862 999 2854 history2 7 2
Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium	ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	10 100 450 3000 1150 1350 4250 <b>limit/base</b> >25 >158 >20	0 50 0 151 2490 1053 1190 4246 <u>current</u> 6 2 3	0 27 0 106 2200 865 1016 3193 history1 5 1 3	0 26 0 100 2040 862 999 2854 history2 7 2 2 3
Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium Fuel INFRA-RED	ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	10 100 450 3000 1150 1350 4250 <b>limit/base</b> >25 >158 >20 >3.0	0 50 0 151 2490 1053 1190 4246 <i>current</i> 6 2 3 3 <1.0 <i>current</i>	0 27 0 106 2200 865 1016 3193 history1 5 1 3 3 <1.0 history1	0 26 0 100 2040 862 999 2854 history2 7 2 2 3 1.7 history2
Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium Fuel INFRA-RED Soot %	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	10 100 450 3000 1150 1350 4250 <b>limit/base</b> >25 >158 >20 >3.0 <b>limit/base</b> >6	0 50 0 151 2490 1053 1190 4246 current 6 2 3 <1.0 current 0.2	0 27 0 106 2200 865 1016 3193 history1 5 1 3 <1.0 history1 0.1	0 26 0 100 2040 862 999 2854 history2 7 2 3 1.7 history2 0.1
Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium Fuel INFRA-RED	ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	10 100 450 3000 1150 1350 4250 <b>limit/base</b> >25 >158 >20 >3.0	0 50 0 151 2490 1053 1190 4246 <i>current</i> 6 2 3 3 <1.0 <i>current</i>	0 27 0 106 2200 865 1016 3193 history1 5 1 3 3 <1.0 history1	0 26 0 100 2040 862 999 2854 history2 7 2 2 3 1.7 history2
Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium Fuel INFRA-RED Soot % Nitration Sulfation	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	10 100 450 3000 1150 1350 4250 <b>limit/base</b> >25 >158 >20 >3.0 <b>limit/base</b> >6 >20 >3.0	0 50 0 151 2490 1053 1190 4246 <i>current</i> 6 2 3 <1.0 <i>current</i> 0.2 6.2 17.3	0 27 0 106 2200 865 1016 3193 history1 5 1 3 <1.0 history1 0.1 4.6 14.1	0 26 0 100 2040 862 999 2854 history2 7 2 3 1.7 history2 0.1 4.7 14.4
Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium Fuel INFRA-RED Soot % Nitration Sulfation FLUID DEGRADA	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D3524 <b>method</b> *ASTM D78444 *ASTM D7624 ASTM D7415	10 100 450 3000 1150 1350 4250 <b>limit/base</b> >25 >158 >20 >3.0 <b>limit/base</b> >6 >20 >3.0 <b>limit/base</b>	0 50 0 151 2490 1053 1190 4246 <b>current</b> 6 2 3 <1.0 <b>current</b> 0.2 6.2 17.3 <b>current</b>	0 27 0 106 2200 865 1016 3193 history1 5 1 3 <1.0 history1 0.1 4.6 14.1 history1	0 26 0 100 2040 862 999 2854 history2 7 2 3 1.7 history2 0.1 4.7 14.4 history2
Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium Fuel INFRA-RED Soot % Nitration Sulfation	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	10 100 450 3000 1150 1350 4250 <b>limit/base</b> >25 >158 >20 >3.0 <b>limit/base</b> >6 >20 >3.0	0 50 0 151 2490 1053 1190 4246 <i>current</i> 6 2 3 <1.0 <i>current</i> 0.2 6.2 17.3	0 27 0 106 2200 865 1016 3193 history1 5 1 3 <1.0 history1 0.1 4.6 14.1	0 26 0 100 2040 862 999 2854 history2 7 2 3 1.7 history2 0.1 4.7 14.4



# **OIL ANALYSIS REPORT**







Jun 14/21

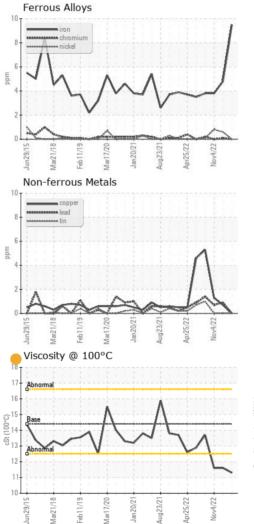
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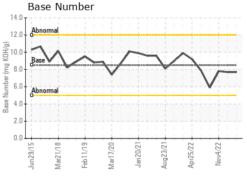
2.0 1.0

0.0

Jan20/2

VISUAL		method	limit/base	current	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
FLUID PROPERT	IES	method	limit/base	current	history1	history2
Visc @ 100°C	cSt	ASTM D445	14.4	<b>e</b> 11.3	11.6	11.6
GRAPHS						





Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513 **INSITUFORM TECHNOLOGIES, INC** : ARI06147019 Sample No. Received : 12 Apr 2024 17988 EDISON AVE. Lab Number : 06147019 Tested : 15 Apr 2024 CHESTERFIELD, MO Unique Number : 10977097 Diagnosed : 15 Apr 2024 - Sean Felton US 63005 Test Package : CONST (Additional Tests: FuelDilution, TBN) Contact: JOHN SLOAN Certificate 12367 ARICHTER@INSITUFORM.COM To discuss this sample report, contact Customer Service at 1-800-237-1369. T: (314)280-7555 \* - 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) F:

Report Id: AR5202CHE [WUSCAR] 06147019 (Generated: 04/15/2024 16:53:00) Rev: 2

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