

PROBLEM SUMMARY

Area **API** API

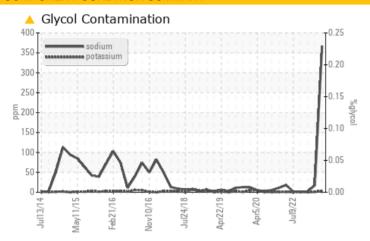
Component **Center Main Engine**

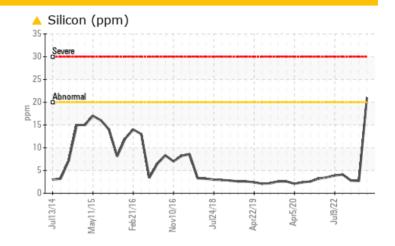
CHEVRON DELO 710 LS (450 GAL)

Sample Rating Trend



COMPONENT CONDITION SUMMARY





RECOMMENDATION

We advise that you check for possible coolant leak. We recommend an early resample to monitor this condition.

PROBLEMATIC TEST RESULTS									
Sample Status				ABNORMAL	NORMAL	NORMAL			
Silicon	ppm	ASTM D5185m	>20	<u> </u>	3	3			
Sodium	mag	ASTM D5185m	>75	△ 366	18	1			

Customer Id: AMESAI **Sample No.:** MW0055079 Lab Number: 05966941 Test Package: MAR 2

To manage this report scan the QR code

To discuss the diagnosis or test data: Jonathan Hester +1 919-379-4092 x4092 ihester@wearcheckusa.com

To change component or sample information: Customer Service +1 1-800-237-1369 customerservice@wearcheck.com

RECOMMENDED ACTIONS

Action	Status	Date	Done By	Description
Resample			?	We recommend an early resample to monitor this condition.
Check Glycol Access			?	We advise that you check for the source of the coolant leak.

HISTORICAL DIAGNOSIS

29 Jul 2023 Diag: Wes Davis

NORMAL



No corrective action is recommended at this time. Resample at the next service interval to monitor. All component wear rates are normal. Fuel content negligible. There is no indication of any contamination in the oil. The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.



13 May 2023 Diag: Wes Davis

NORMAL



Resample at the next service interval to monitor. All component wear rates are normal. There is no indication of any contamination in the oil. The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.



18 Mar 2023 Diag: Don Baldridge

NORMAL

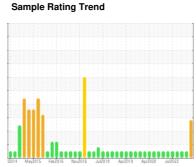


Resample at the next service interval to monitor. All component wear rates are normal. There is no indication of any contamination in the oil. The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.





OIL ANALYSIS REPORT







Area API API Component

Center Main Engine

CHEVRON DELO 710 LS (450 GAL)

DIAGNOSIS

Recommendation

We advise that you check for possible coolant leak. We recommend an early resample to monitor this condition.

Wear

All component wear rates are normal.

Contamination

Sodium and/or potassium levels are high. Elemental level of silicon (Si) above normal indicating ingress of seal material.

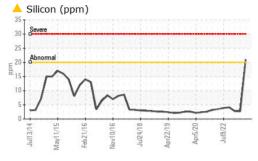
Fluid Condition

The BN result indicates that there is suitable alkalinity remaining in the oil.

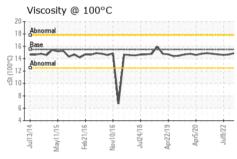
SAMPLE INFORMATION method limitbase current history1 history2 Sample Number Client Info MW0055079 MW0040100 MW0040077 Sample Date Client Info 10927 23 Sep 2023 29 Jul 2023 13 May 2023 Machine Age hrs Client Info 10927 9927 8480 Oil Changed Client Info Not Changed Not Changed Not Changed Oil Changed Status MBNORMAL NORMAL NORMAL CONTAMINATION method limit/base current history1 Fuel WC Method >4.0 <1.0 0.9 <1.0 WEAR METALS method limit/base current history1 history2 Iron ppm ASTM 05185m >75 36 18 25 Chromium ppm ASTM 05185m >2 <1 0 <1 Nickel ppm ASTM 05185m >2 <1 0 <1 Chromium ppm </th <th></th> <th></th> <th>12014 May20</th> <th>115 Feb2016 Nov2016</th> <th>Jul2018 Apr2019 Apr2020</th> <th>Jul2022</th> <th></th>			12014 May20	115 Feb2016 Nov2016	Jul2018 Apr2019 Apr2020	Jul2022	
Sample Date Client Info 23 Sep 2023 29 Jul 2023 13 May 2023 Machine Age hrs Client Info 10927 9927 8480 Oil Age hrs Client Info 10927 9927 8480 Oil Changed Client Info Not Changed Not Changed Not Changed Not Changed Sample Status Image: Control of Machine Math Machine Mot Changed NoRMAL NORMAL CONTAMINATION method limit base current history1 history2 Iron ppm ASTM 05188m >2 1.0 9 <1.0 WEAR METALS method limit base current history1 history2 Iron ppm ASTM 05188m >8 2 1 2 Nickel ppm ASTM 05188m >8 2 1 0 <1 Alluminum ppm ASTM 05188m >2 0 0 0 <1 <1 1 1 1	SAMPLE INFORM	MATION	method	limit/base	current	history1	history2
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Oil Changed Sample Status Client Info Not Changed ABNORMAL NORMAL Not Changed NORMAL NORMAL Not Changed NORMAL NORMAL Not Changed ABNORMAL Not Changed NORMAL NORMAL Not Changed NORMAL Not Changed NORMAL NORMAL NORMAL NORMAL NORMAL		hrs	Client Info		10927	9927	8480
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Nickel	Iron	ppm	ASTM D5185m	>75	36	18	25
Titanium	Chromium	ppm	ASTM D5185m	>8	2	1	2
Silver	Nickel	ppm	ASTM D5185m	>2	<1	0	<1
Silver	Titanium		ASTM D5185m	>3	0	0	<1
Aluminum ppm ASTM D5185m >15 0 <1 <1 Lead ppm ASTM D5185m >18 15 7 9 Copper ppm ASTM D5185m >80 34 10 14 Tin ppm ASTM D5185m >14 7 5 7 Vanadium ppm ASTM D5185m 10 0 0 Cadmium ppm ASTM D5185m 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 0 0 Molybdenum ppm ASTM D5185m 0 0 0 Magnesium ppm ASTM D5185m 1 <1	Silver				0	0	0
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Magnesium ppm ASTM D5185m 15 5 17 Calcium ppm ASTM D5185m 3223 3045 3613 Phosphorus ppm ASTM D5185m 6 5 0 Zinc ppm ASTM D5185m 5 0 0 Sulfur ppm ASTM D5185m 2219 2225 2599 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >20 21 3 3 Sodium ppm ASTM D5185m >75 △ 366 18 1 Potassium ppm ASTM D5185m >20 3 1 0 Glycol % *ASTM D5185m >20 3 1 0 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 1.2 1 0.7 Nitration	Boron Barium	ppm	ASTM D5185m ASTM D5185m	limit/base	116 0	39 0	43
Phosphorus ppm ASTM D5185m 6 5 0 Zinc ppm ASTM D5185m 5 0 0 Sulfur ppm ASTM D5185m 2219 2225 2599 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >20 21 3 3 Sodium ppm ASTM D5185m >75 4 366 18 1 Potassium ppm ASTM D5185m >20 3 1 0 Glycol % *ASTM D5185m >20 3 1 0 REG NEG NEG NEG NEG INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 1.2 1 0.7 Nitration Abs/.1mm *ASTM D7415 >30 19.1 14.5 19.0 FLUID DEGRADAT	Boron Barium Molybdenum	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	limit/base	116 0 48	39 0 38	43 0 47
Zinc ppm ASTM D5185m 5 0 0 Sulfur ppm ASTM D5185m 2219 2225 2599 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >20 21 3 3 Sodium ppm ASTM D5185m >75 4 366 18 1 Potassium ppm ASTM D5185m >20 3 1 0 Glycol % *ASTM D5185m >20 3 1 0 Glycol % *ASTM D5185m >20 3 1 0 Glycol % *ASTM D5185m >20 3 1 0 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 1.2 1 0.7 Nitration Abs/.1mm *ASTM D7415 >30 19.1 14.5 19.0	Boron Barium Molybdenum Manganese	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base	116 0 48 1	39 0 38 <1	43 0 47 <1
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Sodium ppm ASTM D5185m >75 ▲ 366 18 1 Potassium ppm ASTM D5185m >20 3 1 0 Glycol % *ASTM D2982 NEG NEG NEG INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 1.2 1 0.7 Nitration Abs/cm *ASTM D7624 >20 11.9 13.7 10.1 Sulfation Abs/.1mm *ASTM D7415 >30 19.1 14.5 19.0 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 11.1 12.6 12.1	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc	ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base	116 0 48 1 15 3223 6	39 0 38 <1 5 3045 5	43 0 47 <1 17 3613 0
Sodium ppm ASTM D5185m >75 ▲ 366 18 1 Potassium ppm ASTM D5185m >20 3 1 0 Glycol % *ASTM D2982 NEG NEG NEG INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 1.2 1 0.7 Nitration Abs/cm *ASTM D7624 >20 11.9 13.7 10.1 Sulfation Abs/.1mm *ASTM D7415 >30 19.1 14.5 19.0 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 11.1 12.6 12.1	Boron 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 ASTM D5185m		116 0 48 1 15 3223 6 5 2219	39 0 38 <1 5 3045 5 0 2225	43 0 47 <1 17 3613 0 0 2599
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NEG NEG	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS	ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m	limit/base >20	116 0 48 1 15 3223 6 5 2219 current	39 0 38 <1 5 3045 5 0 2225 history1 3	43 0 47 <1 17 3613 0 0 2599 history2
Soot % % *ASTM D7844 >3 1.2 1 0.7 Nitration Abs/cm *ASTM D7624 >20 11.9 13.7 10.1 Sulfation Abs/.1mm *ASTM D7415 >30 19.1 14.5 19.0 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 11.1 12.6 12.1	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium	ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m	limit/base >20 >75	116 0 48 1 15 3223 6 5 2219 current 21 366	39 0 38 <1 5 3045 5 0 2225 history1 3 18	43 0 47 <1 17 3613 0 0 2599 history2 3 1
Nitration Abs/cm *ASTM D7624 > 20 11.9 13.7 10.1 Sulfation Abs/.1mm *ASTM D7415 > 30 19.1 14.5 19.0 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 > 25 11.1 12.6 12.1	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m	limit/base >20 >75	116 0 48 1 15 3223 6 5 2219 current ▲ 21 ▲ 366 3	39 0 38 <1 5 3045 5 0 2225 history1 3 18	43 0 47 <1 17 3613 0 0 2599 history2 3 1
Nitration Abs/cm *ASTM D7624 > 20 11.9 13.7 10.1 Sulfation Abs/.1mm *ASTM D7415 > 30 19.1 14.5 19.0 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 > 25 11.1 12.6 12.1	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m	limit/base >20 >75 >20	116 0 48 1 15 3223 6 5 2219 current ▲ 21 ▲ 366 3 NEG	39 0 38 <1 5 3045 5 0 2225 history1 3 18 1	43 0 47 <1 17 3613 0 0 2599 history2 3 1 0 NEG
Sulfation Abs/.1mm *ASTM D7415 >30 19.1 14.5 19.0 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 11.1 12.6 12.1	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium Glycol INFRA-RED	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m *ASTM D2982 method	limit/base >20 >75 >20	116 0 48 1 15 3223 6 5 2219 current ▲ 21 ▲ 366 3 NEG	39 0 38 <1 5 3045 5 0 2225 history1 3 18 1 NEG	43 0 47 <1 17 3613 0 0 2599 history2 3 1 0 NEG
Oxidation Abs/.1mm *ASTM D7414 >25 11.1 12.6 12.1	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium Glycol INFRA-RED Soot %	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m *ASTM D5185m	limit/base >20 >75 >20 limit/base >3	116 0 48 1 15 3223 6 5 2219 current ▲ 21 ▲ 366 3 NEG current 1.2	39 0 38 <1 5 3045 5 0 2225 history1 3 18 1 NEG	43 0 47 <1 17 3613 0 0 2599 history2 3 1 0 NEG history2 0.7
	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium Glycol INFRA-RED Soot % Nitration	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m *ASTM D5185m **ASTM D7844 **ASTM D7844	limit/base >20 >75 >20 limit/base >3 >20	116 0 48 1 15 3223 6 5 2219 current ▲ 21 ▲ 366 3 NEG current 1.2 11.9	39 0 38 <1 5 3045 5 0 2225 history1 3 18 1 NEG history1 1	43 0 47 <1 17 3613 0 0 2599 history2 3 1 0 NEG history2 0.7 10.1
	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium Glycol INFRA-RED Soot % Nitration Sulfation	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m *ASTM D7844 *ASTM D7624 *ASTM D7624	limit/base >20 >75 >20 limit/base >3 >20 >3 >20 >30	116 0 48 1 15 3223 6 5 2219	39 0 38 <1 5 3045 5 0 2225 history1 3 18 1 NEG history1 1 13.7 14.5	43 0 47 <1 17 3613 0 0 2599 history2 3 1 0 NEG history2 0.7 10.1 19.0
	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium Glycol INFRA-RED Soot % Nitration Sulfation	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m *ASTM D2982 method *ASTM D7844 *ASTM D7844 *ASTM D7844 *ASTM D7844 *ASTM D7844	limit/base	116 0 48 1 15 3223 6 5 2219 current ▲ 21 ▲ 366 3 NEG current 1.2 11.9 19.1 current	39 0 38 <1 5 3045 5 0 2225 history1 3 18 1 NEG history1 1 13.7 14.5 history1	43 0 47 <1 17 3613 0 0 2599 history2 3 1 0 NEG history2 0.7 10.1 19.0 history2

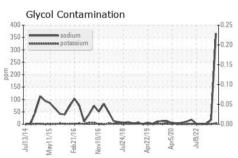


OIL ANALYSIS REPORT



350		sodium potassiur	n				-0.20
250							-0.15
200 - 150 -							0.10
100	1	Λ	M				-0.05
50+ 1			/	\		11.0	1

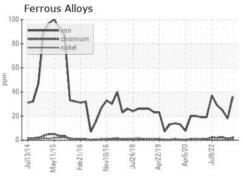


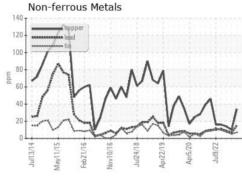


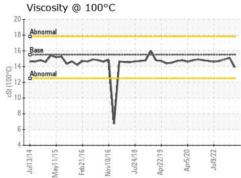
VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual	NONE	NONE	NONE	NONE
Appearance	scalar	*Visual	NORML	NORML	NORML	NORML
Odor	scalar	*Visual	NORML	NORML	NORML	NORML
Emulsified Water	scalar	*Visual	>0.1	NEG	NEG	NEG
Free Water	scalar	*Visual		NEG	NEG	NEG

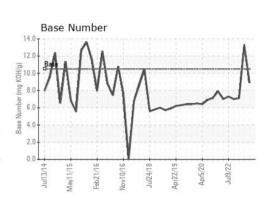
FLUID PROPER	TIES	method	iiiiii/base	current	riistory i	riistoryz
Visc @ 100°C	cSt	ASTM D445	15.5	13.9	15.09	14.9

GRAPHS













Certificate L2367

Laboratory Sample No. Lab Number Unique Number

: MW0055079 : 05966941

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 Received : 10673492

Diagnosed

: 02 Oct 2023 : 04 Oct 2023

Diagnostician : Jonathan Hester

Test Package : MAR 2 (Additional Tests: Glycol) 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)

AMERICAN RIVER TRANSPORTATION CO.

P.O. BOX 2889 ST. LOUIS, MO US 63111

Contact: BRIAN GRIEWING

brian.griewing@adm.com

T: F: (314)481-5278

Report Id: AMESAI [WUSCAR] 05966941 (Generated: 10/04/2023 19:48:15) Rev: 1

Contact/Location: BRIAN GRIEWING - AMESAI