

# **OIL ANALYSIS REPORT**

SAMPLE INFORMATION metho

#### Sample Rating Trend



Machine Id

## **1959** Component **Diesel Engine** Fluid **DIESEL ENGINE OIL SAE 5W30 (--- GAL)**

#### DIAGNOSIS

#### Recommendation

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 BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

Sample Number Sample Date Machine Age Oil Age Oil Changed Sample Status	mls mls	Client Info Client Info Client Info Client Info Client Info		HRE0000114 10 Apr 2024 95216 6000 Changed NORMAL	WC0887621 16 Feb 2024 91112 0 Changed NORMAL	WC0810284 15 Feb 2024 89616 6000 Changed ABNORMAL
CONTAMINATION	J	method	limit/base	current	history1	history2
Fuel Water Glycol		WC Method WC Method WC Method	>5 >0.2	<1.0 NEG NEG	<1.0 NEG NEG	<1.0 NEG NEG
				current		nistory2
Chromium Nickel Titanium	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	>20 >4	8 <1 <1 0	<1 0 <1	<1 <1 <1 <1
Silver	ppm	ASTM D5185m	>3	0	0	0
Aluminum	ppm	ASTM D5185m	>20	3	3	6
Lead	ppm	ASTM D5185m	>40	0	0	0
Tin	ppm	ASTM D5185m	>330	< 1	0	0
Vanadium	mag	ASTM D5185m	210	0	0	0
Cadmium	ppm	ASTM D5185m		0	0	0
ADDITIVES		method				history2
ADDITIVES Boron	ppm	method ASTM D5185m	limit/base 250	current 27	history1 82	history2 67
ADDITIVES Boron Barium	ppm ppm	method ASTM D5185m ASTM D5185m	limit/base 250 10	current 27 <1	history1 82 0	history2 67 0
ADDITIVES Boron Barium Molybdenum	ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m	limit/base 250 10 100	current 27 <1 193	history1 82 0 225	history2 67 0 346
ADDITIVES Boron Barium Molybdenum Manganese	ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base 250 10 100	current 27 <1 193 3	history1 82 0 225 1	history2 67 0 346 4
ADDITIVES Boron Barium Molybdenum Manganese Magnesium	ppm ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base 250 10 100 450	current 27 <1 193 3 589	history1 82 0 225 1 596	history2 67 0 346 4 901
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 250 10 100 450 3000	current 27 <1 193 3 589 1220	history1 82 0 225 1 596 1172	history2 67 0 346 4 901 1679
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus	ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base 250 10 100 450 3000 1150 1250	current 27 <1 193 3 589 1220 586 506	history1 82 0 225 1 596 1172 573 727	history2 67 0 346 4 901 1679 808 1055
ADDITIVES Boron Barium Molybdenum Maganese 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 ASTM D5185m	limit/base 250 10 100 450 3000 1150 1350 4250	current           27           <1           193           3           589           1220           586           696           2638	history1 82 0 225 1 596 1172 573 727 2797	history2 67 0 346 4 901 1679 808 1055 3709
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 ASTM D5185m	limit/base 250 10 100 450 3000 1150 1350 4250	current 27 <1 193 3 589 1220 586 696 2638	history1 82 0 225 1 596 1172 573 727 2797	history2 67 0 346 4 901 1679 808 1055 3709
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS	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 ASTM D5185m	limit/base 250 10 100 450 3000 1150 1350 4250 limit/base	current 27 <1 193 3 589 1220 586 696 2638 current	history1 82 0 225 1 596 1172 573 727 2797 history1	history2 67 0 346 4 901 1679 808 1055 3709 history2
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon	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 ASTM D5185m	limit/base 250 10 100 450 3000 1150 1350 4250 limit/base >25	current           27           <1           193           3           589           1220           586           696           2638           current           16	history1 82 0 225 1 596 1172 573 727 2797 history1 15 1	history2 67 0 346 4 901 1679 808 1055 3709 history2 ▲ 28
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Pataaajum	ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base 250 10 100 450 3000 1150 1350 4250 limit/base >25	current           27           <1           193           3           589           1220           586           696           2638           current           16           <1	history1 82 0 225 1 596 1172 573 727 2797 history1 15 1	history2 67 0 346 4 901 1679 808 1055 3709 history2 ▲ 28 3 2
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium	ppm   ppm   ppm   ppm   ppm   ppm   ppm   ppm   ppm   ppm	method           ASTM D5185m	limit/base 250 10 100 450 3000 1150 1350 4250 limit/base >25 >20	current           27           <1           193           3           589           1220           586           696           2638           current           16           <1           1	history1         82         0         225         1         596         1172         573         727         2797         history1         15         1         <1	history2 67 0 346 4 901 1679 808 1055 3709 history2 ▲ 28 3 2
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED	ppm ppm ppm ppm ppm ppm ppm ppm ppm	method           ASTM D5185m	limit/base 250 10 100 450 3000 1150 1350 4250 25 >25 >20 limit/base	current         27         <1         193         3         589         1220         586         696         2638         current         16         <1         1         current	history1         82         0         225         1         596         1172         573         727         2797         history1         15         1         -1         history1	history2 67 0 346 4 901 1679 808 1055 3709 history2 28 3 2 105 1055
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED Soot %	ppm	method           ASTM D5185m	limit/base 250 10 100 450 3000 1150 1350 4250 limit/base >25 >20 limit/base >3 20	current         27         <1         193         3         589         1220         586         696         2638         current         16         <1         1         current         0         10 0	history1         82         0         225         1         596         1172         573         727         2797         history1         15         1         <1         history1         0         0         7	history2 67 0 346 4 901 1679 808 1055 3709 history2 ▲ 28 3 2 history2 0
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED Soot % Nitration	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	method           ASTM D5185m	limit/base 250 10 100 450 3000 1150 1350 4250 limit/base >20 limit/base >3 >20	current         27         <1         193         3         589         1220         586         696         2638         current         16         <1         10.3         21.2	history1         82         0         225         1         596         1172         573         727         2797         history1         15         1         <1         history1         0         7.6         16 €	history2 67 0 346 4 901 1679 808 1055 3709 history2 ▲ 28 3 2 history2 0 9.6 10.4
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	method           ASTM D5185m	limit/base 250 10 100 450 3000 1150 1350 4250 limit/base >25 >20 limit/base >3 >20 >30	current         27         <1         193         3         589         1220         586         696         2638         current         16         <1         1         current         0         10.3         21.2	history1         82         0         225         1         596         1172         573         727         2797         history1         15         1         <1         history1         0         7.6         16.6	history2 67 0 346 4 901 1679 808 1055 3709 bistory2 28 3 2 bistory2 0 9.6 19.4
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation FLUID DEGRADA	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	method           ASTM D5185m           ASTM D7844           *ASTM D7415           ASTM D7415           Method	limit/base 250 10 100 450 3000 1150 1350 4250 limit/base >20 S3 >20 S3 30 limit/base	current         27         <1         193         3         589         1220         586         696         2638         current         16         <1         0         10.3         21.2	history1         82         0         225         1         596         1172         573         727         2797         history1         15         1         <1         history1         0         7.6         16.6         history1	<ul> <li>history2</li> <li>67</li> <li>0</li> <li>346</li> <li>4</li> <li>901</li> <li>1679</li> <li>808</li> <li>1055</li> <li>3709</li> <li>history2</li> <li>▲ 28</li> <li>3</li> <li>2</li> <li>history2</li> <li>0</li> <li>9.6</li> <li>19.4</li> <li>history2</li> </ul>
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation FLUID DEGRADA Oxidation	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	method           ASTM D5185m           ASTM D7844           *ASTM D7624           *ASTM D7414	limit/base 250 10 100 450 3000 1150 1350 4250 <b>limit/base</b> >20 <b>limit/base</b> >20 30 <b>limit/base</b> >20	current         27         <1         193         3         589         1220         586         696         2638         current         16         <1         0         10.3         21.2         current         14.5	history1         82         0         225         1         596         1172         573         727         2797         history1         15         1         51         <1         history1         0         7.6         16.6         history1         10.6	history2 67 0 346 4 901 1679 808 1055 3709 bistory2 28 3 2 bistory2 0 9.6 19.4 bistory2 13.2



Feb14/22

Aug11/22

Dec1/22

Aar97/93

# **OIL ANALYSIS REPORT**





Feb15/24

0ct11/23

Jun15/23

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	10.9	10.2	10.1	10.4
GRAPHS						





TOWN OF CHAPEL HILL Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513 Sample No. : HRE0000114 Received : 15 Apr 2024 6900 MILLHOUSE RD Lab Number : 06148477 Tested : 16 Apr 2024 CHAPEL HILL, NC Unique Number : 10978555 Diagnosed : 17 Apr 2024 - Jonathan Hester US 27516 Test Package : FLEET Contact: Lisa DePasqua Certificate 12367 To discuss this sample report, contact Customer Service at 1-800-237-1369. ldepasqua@townofchapelhill.org \* - Denotes test methods that are outside of the ISO 17025 scope of accreditation. T: (919)696-4941 Statements of conformity to specifications are based on the simple acceptance decision rule (JCGM 106:2012) F:

Contact/Location: Lisa DePasqua - TOWCHANC