

TCW III Oil Test Results

Sample A: Evinrude XD50

Sample B: Pennzoil Premium Plus Semi Synthetic

Sample C: Supertech

Sample D: Mercury Marine Optimax/DFI

Sample E: Yamalube 2M Semi Synthetic

[easy to read additives list](#)

<http://www.sea-doo.net/techarticles/oil/oil.htm>

<http://www.powerchutes.com/oil.pdf>

[Results from someone else](#)

[Link to a viscosity chart](#)

Basically the oil tested is 20W

[molybdenum](#)

Thanks to RobShaw

[Mercury oil is made by Citgo](#)

[Citgo oil's MSDS looks the same as Mercury's](#)

[Yamaha is also made by Citgo](#)



OIL REPORT

LAB NUMBER: D38470
REPORT DATE: 5/1/2008
CODE: 44/284

UNIT ID: A
CLIENT ID: 31016
PAYMENT: Prepaid

UNIT	MAKE/MODEL: Virgin Oil	OIL TYPE & GRADE: Cycle Oil
	FUEL TYPE:	OIL USE INTERVAL:
	ADDITIONAL INFO: Cycle Oil	

CLIENT	
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COMMENTS	PAUL: This oil was clean and dry and with this viscosity, could be a 46-grade. The traces of metals probably shouldn't be there but we doubt they will hurt anything.
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ELEMENTS IN PARTS PER MILLION	MI/HR on Oil		UNIT / LOCATION AVERAGES						
	MI/HR on Unit								UNIVERSAL AVERAGES
	Sample Date	04/30/08							
	Make Up Oil Added								
	ALUMINUM	0							
	CHROMIUM	0							
	IRON	1							
	COPPER	1							
	LEAD	0							
	TIN	0							
	MOLYBDENUM	0							
	NICKEL	0							
	MANGANESE	0							
	SILVER	0							
	TITANIUM	0							
	POTASSIUM	0							
	BORON	0							
	SILICON	3							
	SODIUM	2							
	CALCIUM	4							
	MAGNESIUM	0							
	PHOSPHORUS	2							
	ZINC	3							
	BARIUM	0							

Values
Should Be*

PROPERTIES	SUS Viscosity @ 210°F	52.6						
	cSt Viscosity @ 100°C	8.07						
	Flashpoint in °F	215						
	Fuel %	-						
	Antifreeze %	-						
	Water %	0.0						
	Insolubles %	0.0						
	TBN							
	TAN							
	ISO Code							

* THIS COLUMN APPLIES ONLY TO THE CURRENT SAMPLE

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OIL REPORT

LAB NUMBER: D38471

UNIT ID: B

REPORT DATE: 5/1/2008

CLIENT ID: 31016

CODE: 44/284

PAYMENT: Prepaid

UNIT	MAKE/MODEL: Virgin Oil	OIL TYPE & GRADE: Cycle Oil
	FUEL TYPE:	OIL USE INTERVAL:
	ADDITIONAL INFO: Cycle Oil	

CLIENT	
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COMMENTS	PAUL: This oil has slightly more additive in it (we're talking traces here) but otherwise it contained little of note. The viscosity read closer to a 68-grade than the 46-grade of Sample A.
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ELEMENTS IN PARTS PER MILLION	Mi/HR on Oil		UNIT / LOCATION AVERAGES						UNIVERSAL AVERAGES
	Mi/HR on Unit								
	Sample Date	04/30/08							
	Make Up Oil Added								
	ALUMINUM	0							
	CHROMIUM	0							
	IRON	1							
	COPPER	0							
	LEAD	0							
	TIN	0							
	MOLYBDENUM	0							
	NICKEL	0							
	MANGANESE	0							
	SILVER	0							
	TITANIUM	0							
	POTASSIUM	0							
	BORON	0							
	SILICON	0							
PROPERTIES	SODIUM	4							
	CALCIUM	8							
	MAGNESIUM	1							
	PHOSPHORUS	2							
	ZINC	3							
	BARIUM	0							

Values
Should Be*

PROPERTIES	SUS Viscosity @ 210°F	57.7						
	cSt Viscosity @ 100°C	9.56						
	Flashpoint in °F	210						
	Fuel %	-						
	Antifreeze %	-						
	Water %	0.0						
	Insolubles %	0.0						
	TBN							
	TAN							
	ISO Code							

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OIL REPORT

LAB NUMBER: D38472

UNIT ID: C

REPORT DATE: 5/1/2008

CLIENT ID: 31016

CODE: 44/284

PAYMENT: Prepaid

UNIT	MAKE/MODEL:	Virgin Oil	OIL TYPE & GRADE:	Cycle Oil
	FUEL TYPE:		OIL USE INTERVAL:	
	ADDITIONAL INFO:	Cycle Oil		

CLIENT	
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COMMENTS	PAUL: No trace metals found here. The viscosity read in the ISO 46-grade range, though it's not far from being a 68-grade. No moisture or insolubles found. Additives were scant, just like in the other samples.
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ELEMENTS IN PARTS PER MILLION	Mi/HR on Oil		UNIT / LOCATION AVERAGES							UNIVERSAL AVERAGES
	Mi/HR on Unit									
	Sample Date	04/30/08								
	Make Up Oil Added									
	ALUMINUM	0								
	CHROMIUM	0								
	IRON	0								
	COPPER	0								
	LEAD	0								
	TIN	0								
	MOLYBDENUM	0								
	NICKEL	0								
	MANGANESE	0								
	SILVER	0								
	TITANIUM	0								
	POTASSIUM	0								
	BORON	0								
	SILICON	0								
	SODIUM	2								
	CALCIUM	7								
	MAGNESIUM	0								
	PHOSPHORUS	4								
	ZINC	3								
	BARIUM	0								

Values
Should Be*

PROPERTIES	SUS Viscosity @ 210°F	53.3							
	cSt Viscosity @ 100°C	8.28							
	Flashpoint in °F	215							
	Fuel %	-							
	Antifreeze %	-							
	Water %	0.0							
	Insolubles %	0.0							
	TBN								
	TAN								
	ISO Code								

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OIL REPORT

LAB NUMBER: D38473

UNIT ID: D

REPORT DATE: 5/1/2008

CLIENT ID: 31016

CODE: 44/284

PAYMENT: Prepaid

UNIT	MAKE/MODEL:	Virgin Oil	OIL TYPE & GRADE:	Cycle Oil
	FUEL TYPE:		OIL USE INTERVAL:	
	ADDITIONAL INFO:	Cycle Oil		

CLIENT	
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COMMENTS	PAUL: You can see the molybdenum in this sample, which is the only significant additive, Boron read at 18 ppm. Everything else is pretty minor. The viscosity of this oil read closer to a 32-grade oil, thinner than Samples A, B, or C.
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ELEMENTS IN PARTS PER MILLION	Mi/HR on Oil		UNIT / LOCATION AVERAGES							UNIVERSAL AVERAGES
	Mi/HR on Unit									
	Sample Date	04/30/08								
	Make Up Oil Added									
	ALUMINUM	0								
	CHROMIUM	0								
	IRON	2								
	COPPER	1								
	LEAD	0								
	TIN	0								
	MOLYBDENUM	1069								
	NICKEL	0								
	MANGANESE	0								
	SILVER	0								
	TITANIUM	0								
	POTASSIUM	0								
	BORON	18								
	SILICON	7								
	SODIUM	4								
	CALCIUM	9								
	MAGNESIUM	0								
	PHOSPHORUS	9								
	ZINC	1								
	BARIUM	0								

Values
Should Be*

PROPERTIES	SUS Viscosity @ 210°F	47.3							
	cSt Viscosity @ 100°C	6.44							
	Flashpoint in °F	215							
	Fuel %	-							
	Antifreeze %	-							
	Water %	0.0							
	Insolubles %	0.0							
	TBN								
	TAN								
	ISO Code								

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OIL REPORT

LAB NUMBER: D38474

UNIT ID: E

REPORT DATE: 5/1/2008

CLIENT ID: 31016

CODE: 44/284

PAYMENT: Prepaid

UNIT	MAKE/MODEL: Virgin Oil	OIL TYPE & GRADE: Cycle Oil
	FUEL TYPE:	OIL USE INTERVAL:
	ADDITIONAL INFO: Cycle Oil	

CLIENT	
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COMMENTS	PAUL: This oil resembles an ATF in additives and viscosity. It also has a lot of moly in it (which most ATFs do not). The viscosity read in the ISO 46-grade range. The first 3 samples are all very similar and there's no significant difference between them, except the viscosity. The last two contained more additive. We don't know what kind your 2-cycle outboard calls for, as far as oil. You can't go wrong following what the manufacturer says. If you want a certain viscosity, there are some differences. You could run each for a certain # of hrs and see how wear compares.
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ELEMENTS IN PARTS PER MILLION	Mi/HR on Oil		UNIT / LOCATION AVERAGES						UNIVERSAL AVERAGES
	Mi/HR on Unit								
	Sample Date	04/30/08							
	Make Up Oil Added								
	ALUMINUM	0							
	CHROMIUM	0							
	IRON	1							
	COPPER	0							
	LEAD	0							
	TIN	0							
	MOLYBDENUM	948							
	NICKEL	0							
	MANGANESE	0							
	SILVER	0							
	TITANIUM	0							
	POTASSIUM	1							
	BORON	15							
	SILICON	5							
	SODIUM	3							
	CALCIUM	30							
	MAGNESIUM	0							
	PHOSPHORUS	266							
	ZINC	17							
	BARIUM	0							

Values
Should Be*

PROPERTIES	SUS Viscosity @ 210°F	51.2							
	cSt Viscosity @ 100°C	7.63							
	Flashpoint in °F	250							
	Fuel %	-							
	Antifreeze %	-							
	Water %	0.0							
	Insolubles %	0.0							
	TBN								
	TAN								
	ISO Code								

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