



OIL REPORT

LAB NUMBER: S113858 UNIT ID: N181MC
 REPORT DATE: 9/10/2024 CLIENT ID: 169115
 CODE: 1/436 PAYMENT: CC: Visa (Bulk)

UNIT	MAKE/MODEL: Continental IO-550-N68	OIL TYPE & GRADE: Phillips XC (A/C) 20W/50
	FUEL TYPE: Gasoline (Leaded)	OIL USE INTERVAL: 50 Hours
	ADDITIONAL INFO: Cirrus SR22, S/N: 1036520, 4720	

CLIENT	RICK MCCOMB / JIM ODENWALDT/ DANIEL ST	PHONE: (703) 443-4739
	FLY ADVANCED WINCHESTER	FAX:
	509 AIRPORT RD	ALT PHONE: (508) 633-2495
	SUITE 109	EMAIL: rmccomb@flyadvanced.com,
	WINCHESTER, VA 22602	jodenwaldt@flyadvanced.com,

COMMENTS
 RICK/JIM: Another 50-hour run produced another fantastic report for this Cirrus. Wear levels look excellent and the physical properties are within spec. Keep up the great work!

	MI/HR on Oil	50	UNIT / LOCATION AVERAGES	50	50	48	50	50	UNIVERSAL AVERAGES
	MI/HR on Unit	2,116		1,659	1,608	1,582			
	Sample Date	8/16/2024		6/11/2024	4/5/2024	2/1/2024	11/10/2023	8/18/2023	
	Make Up Oil Added								
ELEMENTS IN PARTS PER MILLION	ALUMINUM	7	10	5	4	8	6	6	7
	CHROMIUM	10	12	8	7	12	11	10	11
	IRON	44	48	39	31	54	46	42	50
	COPPER	3	5	3	2	4	3	3	5
	LEAD	6357	6095	6091	4866	7642	7802	7037	5703
	TIN	1	1	1	0	2	2	2	2
	MOLYBDENUM	4	6	4	3	7	6	5	5
	NICKEL	17	12	12	9	15	13	12	11
	MANGANESE	1	1	0	0	1	1	1	1
	SILVER	0	0	0	0	0	0	0	0
	TITANIUM	0	0	0	0	1	0	0	0
	POTASSIUM	0	0	0	0	0	0	0	0
	BORON	0	1	2	1	4	1	0	1
	SILICON	7	8	7	5	9	10	16	6
	SODIUM	1	2	2	2	2	1	1	2
	CALCIUM	1	2	1	0	2	1	1	26
	MAGNESIUM	0	0	0	0	0	0	0	1
	PHOSPHORUS	2	196	2	1	5	1	1	193
	ZINC	2	3	2	2	4	2	2	4
	BARIUM	0	0	0	0	0	0	0	0

Values Should Be*

PROPERTIES	SUS Viscosity @ 210°F	90.0	86-105	87.9	88.6	89.6	85.2	88.0
	cSt Viscosity @ 100°C	17.97	17.0-21.8	17.48	17.65	17.88	16.82	17.49
	Flashpoint in °F	445	>430	470	445	415	415	435
	Fuel %	<0.5	<1.0	<0.5	<0.5	0.8	0.8	<0.5
	Antifreeze %	-		-	-	-	-	-
	Water %	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Insolubles %	0.3	<0.6	0.4	0.4	0.4	0.4	0.4
	TBN							
	TAN							
	ISO Code							

* THIS COLUMN APPLIES ONLY TO THE CURRENT SAMPLE

416 E. PETTIT AVE. FORT WAYNE, IN 46806 (260) 744-2380 www.blackstone-labs.com



OIL REPORT

LAB NUMBER: S079784

UNIT ID: N181MC

REPORT DATE: 7/8/2024

CLIENT ID: 169115

CODE: 1/436

PAYMENT: CC: Visa (Bulk)

UNIT	MAKE/MODEL: Continental IO-550-N68	OIL TYPE & GRADE: Phillips XC (A/C) 20W/50
	FUEL TYPE: Gasoline (Leaded)	OIL USE INTERVAL: 50 Hours
	ADDITIONAL INFO: Cirrus SR22, S/N: 1036520, 4720	

CLIENT	RICK MCCOMB / JIM ODENWALDT/ DANIEL ST	PHONE: (703) 443-4739
	FLY ADVANCED WINCHESTER	FAX:
	509 AIRPORT RD	ALT PHONE: (508) 633-2495
	SUITE 109	EMAIL: rmccomb@flyadvanced.com,
	WINCHESTER, VA 22602	jodenwaldt@flyadvanced.com,

COMMENTS
 RICK/JIM: All is well at 1,658.7 hours SNew. Wear metals are mostly low, so they match up nicely with recent trends. The viscosity was still on target and there's nothing out of line with the remaining physical properties.

ELEMENTS IN PARTS PER MILLION	MI/HR on Oil	50	50	48	50	50	50	UNIVERSAL AVERAGES
	MI/HR on Unit	1,659	1,608	1,582				
	Sample Date	6/11/2024	4/5/2024	2/1/2024	11/10/2023	8/18/2023	6/19/2023	
	Make Up Oil Added							
	UNIT / LOCATION AVERAGES							
ALUMINUM	5	10	4	8	6	6	5	7
CHROMIUM	8	12	7	12	11	10	10	11
IRON	39	48	31	54	46	42	39	50
COPPER	3	5	2	4	3	3	2	5
LEAD	6091	6095	4866	7642	7802	7037	5897	5703
TIN	1	1	0	2	2	2	1	2
MOLYBDENUM	4	6	3	7	6	5	5	5
NICKEL	12	12	9	15	13	12	12	11
MANGANESE	0	1	0	1	1	1	0	1
SILVER	0	0	0	0	0	0	0	0
TITANIUM	0	0	0	1	0	0	0	0
POTASSIUM	0	0	0	0	0	0	0	0
BORON	2	1	1	4	1	0	2	1
SILICON	7	8	5	9	10	16	5	6
SODIUM	2	2	2	2	1	1	2	2
CALCIUM	1	2	0	2	1	1	1	26
MAGNESIUM	0	0	0	0	0	0	0	1
PHOSPHORUS	2	196	1	5	1	1	3	193
ZINC	2	3	2	4	2	2	1	4
BARIUM	0	0	0	0	0	0	0	0

Values Should Be*

PROPERTIES	87.9	86-105	88.6	89.6	85.2	88.0	90.1
SUS Viscosity @ 210°F	87.9	86-105	88.6	89.6	85.2	88.0	90.1
cSt Viscosity @ 100°C	17.48	17.0-21.8	17.65	17.88	16.82	17.49	18.01
Flashpoint in °F	470	>430	445	415	415	435	430
Fuel %	<0.5	<1.0	<0.5	0.8	0.8	<0.5	TR
Antifreeze %	-		-	-	-	-	-
Water %	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Insolubles %	0.4	<0.6	0.4	0.4	0.4	0.4	0.4
TBN							
TAN							
ISO Code							

* THIS COLUMN APPLIES ONLY TO THE CURRENT SAMPLE

416 E. PETTIT AVE. FORT WAYNE, IN 46806 (260) 744-2380 www.blackstone-labs.com



OIL REPORT

LAB NUMBER: S047043 UNIT ID: N181MC
 REPORT DATE: 4/19/2024 CLIENT ID: 169115
 CODE: 1/436 PAYMENT: CC: Visa (Bulk)

UNIT	MAKE/MODEL: Continental IO-550-N68	OIL TYPE & GRADE: Phillips XC (A/C) 20W/50
	FUEL TYPE: Gasoline (Leaded)	OIL USE INTERVAL: 50 Hours
	ADDITIONAL INFO: Cirrus SR22, S/N: 1036520, 4720	

CLIENT	RICK MCCOMB / JIM ODENWALDT/ DANIEL ST	PHONE: (703) 443-4739
	FLY ADVANCED WINCHESTER	FAX:
	509 AIRPORT RD	ALT PHONE: (508) 633-2495
	SUITE 109	EMAIL: rmccomb@flyadvanced.com,
	WINCHESTER, VA 22602	jodenwaldt@flyadvanced.com,

COMMENTS
 RICK/JIM: Nice report. The fuel contamination is gone, and wear metals are looking good. We're guessing maybe more make-up oil was added and that accounts for the improvement to metals, or maybe operation changed and that's why metals are down. Either way, we like it. No moisture contamination was noted. The air and oil filters were working well while this oil was in use.

ELEMENTS IN PARTS PER MILLION	MI/HR on Oil	50	UNIT / LOCATION AVERAGES	48	50	50	50	50	UNIVERSAL AVERAGES
	MI/HR on Unit	1,608		1,582				1,383	
	Sample Date	4/5/2024		2/1/2024	11/10/2023	8/18/2023	6/19/2023	5/19/2023	
	Make Up Oil Added								
ALUMINUM	4	10	8	6	6	5	7	7	
CHROMIUM	7	12	12	11	10	10	15	11	
IRON	31	48	54	46	42	39	53	50	
COPPER	2	5	4	3	3	2	5	5	
LEAD	4866	6095	7642	7802	7037	5897	6827	5703	
TIN	0	1	2	2	2	1	1	2	
MOLYBDENUM	3	6	7	6	5	5	7	5	
NICKEL	9	12	15	13	12	12	16	11	
MANGANESE	0	1	1	1	1	0	1	1	
SILVER	0	0	0	0	0	0	0	0	
TITANIUM	0	0	1	0	0	0	0	0	
POTASSIUM	0	0	0	0	0	0	0	0	
BORON	1	1	4	1	0	2	0	1	
SILICON	5	8	9	10	16	5	7	6	
SODIUM	2	2	2	1	1	2	1	2	
CALCIUM	0	2	2	1	1	1	1	26	
MAGNESIUM	0	0	0	0	0	0	0	1	
PHOSPHORUS	1	196	5	1	1	3	17	193	
ZINC	2	3	4	2	2	1	2	4	
BARIUM	0	0	0	0	0	0	0	0	

Values Should Be*

PROPERTIES	SUS Viscosity @ 210°F	88.6	86-105	89.6	85.2	88.0	90.1	87.6
	cSt Viscosity @ 100°C	17.65	17.0-21.8	17.88	16.82	17.49	18.01	17.41
	Flashpoint in °F	445	>430	415	415	435	430	455
	Fuel %	<0.5	<1.0	0.8	0.8	<0.5	TR	<0.5
	Antifreeze %	-		-	-	-	-	-
	Water %	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Insolubles %	0.4	<0.6	0.4	0.4	0.4	0.4	0.4
	TBN							
	TAN							
	ISO Code							

* THIS COLUMN APPLIES ONLY TO THE CURRENT SAMPLE

416 E. PETTIT AVE. FORT WAYNE, IN 46806 (260) 744-2380 www.blackstone-labs.com



OIL REPORT

LAB NUMBER: S022349
 REPORT DATE: 2/21/2024
 CODE: 1/436

UNIT ID: N181MC
 CLIENT ID: 169115
 PAYMENT: CC: Visa (Bulk)

UNIT	MAKE/MODEL: Continental IO-550-N68	OIL TYPE & GRADE: Phillips XC (A/C) 20W/50
	FUEL TYPE: Gasoline (Leaded)	OIL USE INTERVAL: 48 Hours
	ADDITIONAL INFO: Cirrus SR22, S/N: 1036520, 4720	

CLIENT	RICK MCCOMB / JIM ODENWALDT/ DANIEL ST	PHONE: (703) 443-4739
	FLY ADVANCED WINCHESTER	FAX:
	509 AIRPORT RD	ALT PHONE: (508) 633-2495
	SUITE 109	EMAIL: rmccomb@flyadvanced.com,
	WINCHESTER, VA 22602	jodenwaldt@flyadvanced.com,

COMMENTS
 RICK/JIM: Fuel dilution is still a consideration for this engine, but it's still at a low enough level that it doesn't seem like a serious concern. It didn't thin the viscosity this time, and wearing parts are getting along just fine, even with some fuel in the oil. The wear metals are stable compared to what we're used to finding from N181MC, so no mechanical issues or poor wear is evident. Nice report at 1,582.4 hours SNew.

ELEMENTS IN PARTS PER MILLION	MI/HR on Oil	48	UNIT / LOCATION AVERAGES	50	50	50	50	50	UNIVERSAL AVERAGES	
	MI/HR on Unit	1,582						1,383		1,333
	Sample Date	2/1/2024		11/10/2023	8/18/2023	6/19/2023	5/19/2023	2/28/2023		
	Make Up Oil Added									
ALUMINUM	8	10	6	6	5	7	12	7		
CHROMIUM	12	12	11	10	10	15	16	11		
IRON	54	48	46	42	39	53	63	50		
COPPER	4	5	3	3	2	5	9	5		
LEAD	7642	6095	7802	7037	5897	6827	6129	5703		
TIN	2	1	2	2	1	1	1	2		
MOLYBDENUM	7	6	6	5	5	7	10	5		
NICKEL	15	12	13	12	12	16	14	11		
MANGANESE	1	1	1	1	0	1	1	1		
SILVER	0	0	0	0	0	0	0	0		
TITANIUM	1	0	0	0	0	0	0	0		
POTASSIUM	0	0	0	0	0	0	0	0		
BORON	4	1	1	0	2	0	1	1		
SILICON	9	8	10	16	5	7	12	6		
SODIUM	2	2	1	1	2	1	2	2		
CALCIUM	2	2	1	1	1	1	2	26		
MAGNESIUM	0	0	0	0	0	0	0	1		
PHOSPHORUS	5	196	1	1	3	17	225	193		
ZINC	4	3	2	2	1	2	2	4		
BARIUM	0	0	0	0	0	0	0	0		

Values Should Be*

PROPERTIES	SUS Viscosity @ 210°F	89.6	86-105	85.2	88.0	90.1	87.6	92.1
	cSt Viscosity @ 100°C	17.88	17.0-21.8	16.82	17.49	18.01	17.41	18.48
	Flashpoint in °F	415	>430	415	435	430	455	440
	Fuel %	0.8	<1.0	0.8	<0.5	TR	<0.5	<0.5
	Antifreeze %	-		-	-	-	-	-
	Water %	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Insolubles %	0.4	<0.6	0.4	0.4	0.4	0.4	0.4
	TBN							
	TAN							
	ISO Code							

* THIS COLUMN APPLIES ONLY TO THE CURRENT SAMPLE

416 E. PETTIT AVE. FORT WAYNE, IN 46806 (260) 744-2380 www.blackstone-labs.com



OIL REPORT

LAB NUMBER: R93071 UNIT ID: N181MC
 REPORT DATE: 12/12/2023 CLIENT ID: 169115
 CODE: 1/436 PAYMENT: CC: Visa (Bulk)

UNIT	MAKE/MODEL: Continental IO-550-N68	OIL TYPE & GRADE: Phillips XC (A/C) 20W/50
	FUEL TYPE: Gasoline (Leaded)	OIL USE INTERVAL: 50 Hours
	ADDITIONAL INFO: Cirrus SR22, S/N: 1036520, 4720	

CLIENT	RICK MCCOMB / JIM ODENWALDT/ DANIEL ST	PHONE: (703) 443-4739
	FLY ADVANCED WINCHESTER	FAX:
	509 AIRPORT RD	ALT PHONE: (508) 633-2495
	SUITE 109	EMAIL: rmccomb@flyadvanced.com,
	WINCHESTER, VA 22602	jodenwaldt@flyadvanced.com,

COMMENTS
 RICK/JIM: Silicon decreased, and while the silicon in the last sample seemed harmless since it didn't correspond to excess wear, now we don't have to wonder about it anymore. We did detect fuel in the oil, but neither the small amount of fuel dilution nor the slightly thin viscosity is likely to be a problem. The wear metals are still in good form, reading at typical levels compared to past reports and averages. Good report.

ELEMENTS IN PARTS PER MILLION	MI/HR on Oil	50	UNIT / LOCATION AVERAGES	50	50	50	50	50	UNIVERSAL AVERAGES
	MI/HR on Unit								
	Sample Date	11/10/2023		8/18/2023	6/19/2023	5/19/2023	2/28/2023	10/5/2021	
	Make Up Oil Added								
ALUMINUM	6	10	6	5	7	12	8	7	
CHROMIUM	11	12	10	10	15	16	13	11	
IRON	46	48	42	39	53	63	51	50	
COPPER	3	5	3	2	5	9	3	5	
LEAD	7802	6095	7037	5897	6827	6129	6946	5703	
TIN	2	1	2	1	1	1	1	2	
MOLYBDENUM	6	6	5	5	7	10	7	5	
NICKEL	13	12	12	12	16	14	14	11	
MANGANESE	1	1	1	0	1	1	1	1	
SILVER	0	0	0	0	0	0	0	0	
TITANIUM	0	0	0	0	0	0	0	0	
POTASSIUM	0	0	0	0	0	0	0	0	
BORON	1	1	0	2	0	1	1	1	
SILICON	10	8	16	5	7	12	4	6	
SODIUM	1	2	1	2	1	2	1	2	
CALCIUM	1	2	1	1	1	2	0	26	
MAGNESIUM	0	0	0	0	0	0	0	1	
PHOSPHORUS	1	196	1	3	17	225	0	193	
ZINC	2	3	2	1	2	2	2	4	
BARIUM	0	0	0	0	0	0	0	0	

Values Should Be*

PROPERTIES	SUS Viscosity @ 210°F	85.2	86-105	88.0	90.1	87.6	92.1	90.9
	cSt Viscosity @ 100°C	16.82	17.0-21.8	17.49	18.01	17.41	18.48	18.20
	Flashpoint in °F	415	>430	435	430	455	440	450
	Fuel %	0.8	<1.0	<0.5	TR	<0.5	<0.5	<0.5
	Antifreeze %	-		-	-	-	-	-
	Water %	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Insolubles %	0.4	<0.6	0.4	0.4	0.4	0.4	0.3
	TBN							
	TAN							
	ISO Code							

* THIS COLUMN APPLIES ONLY TO THE CURRENT SAMPLE

416 E. PETTIT AVE. FORT WAYNE, IN 46806 (260) 744-2380 www.blackstone-labs.com



OIL REPORT

LAB NUMBER: R54518

UNIT ID: N181MC

REPORT DATE: 9/11/2023

CLIENT ID: 169115

CODE: 1/436

PAYMENT: CC: Visa (Bulk)

UNIT	MAKE/MODEL: Continental IO-550-N68	OIL TYPE & GRADE: Phillips XC (A/C) 20W/50
	FUEL TYPE: Gasoline (Leaded)	OIL USE INTERVAL: 50 Hours
	ADDITIONAL INFO: Cirrus SR22, S/N: 1036520, 4720	

CLIENT	RICK MCCOMB / JIM ODENWALDT/ DANIEL ST	PHONE: (703) 443-4739
	FLY ADVANCED WINCHESTER	FAX:
	509 AIRPORT RD	ALT PHONE: (508) 633-2495
	SUITE 109	EMAIL: rmccomb@flyadvanced.com,
	WINCHESTER, VA 22602	jodenwaldt@flyadvanced.com,

COMMENTS RICK/JIM: N181MC's air filtration system could also use a quick once-over. Silicon is higher than last time, and while it's likely coming from a harmless source (since there doesn't appear to be extra wear going on), it wouldn't hurt to check the air intake system for good measure. The flashpoint was high enough to rule out any measurable fuel dilution this time, and insolubles were low enough to indicate good oil filtration and combustion. Good report, all in all.

ELEMENTS IN PARTS PER MILLION	MI/HR on Oil	50	UNIT / LOCATION AVERAGES	50	50	50	50	50	UNIVERSAL AVERAGES
	MI/HR on Unit			1,383	1,333	903	852		
	Sample Date	8/18/2023		6/19/2023	5/19/2023	2/28/2023	10/5/2021	8/16/2021	
	Make Up Oil Added								
ALUMINUM	6	10	5	7	12	8	9	7	
CHROMIUM	10	12	10	15	16	13	15	11	
IRON	42	48	39	53	63	51	57	50	
COPPER	3	5	2	5	9	3	5	5	
LEAD	7037	6095	5897	6827	6129	6946	7098	5703	
TIN	2	1	1	1	1	1	1	2	
MOLYBDENUM	5	6	5	7	10	7	7	5	
NICKEL	12	12	12	16	14	14	20	11	
MANGANESE	1	1	0	1	1	1	1	1	
SILVER	0	0	0	0	0	0	0	0	
TITANIUM	0	0	0	0	0	0	1	0	
POTASSIUM	0	0	0	0	0	0	0	0	
BORON	0	1	2	0	1	1	1	1	
SILICON	16	8	5	7	12	4	4	6	
SODIUM	1	2	2	1	2	1	2	2	
CALCIUM	1	2	1	1	2	0	0	26	
MAGNESIUM	0	0	0	0	0	0	0	1	
PHOSPHORUS	1	196	3	17	225	0	2	193	
ZINC	2	3	1	2	2	2	3	4	
BARIUM	0	0	0	0	0	0	0	0	

Values Should Be*

PROPERTIES	SUS Viscosity @ 210°F	88.0	86-105	90.1	87.6	92.1	90.9	89.5
	cSt Viscosity @ 100°C	17.49	17.0-21.8	18.01	17.41	18.48	18.20	17.85
	Flashpoint in °F	435	>430	430	455	440	450	445
	Fuel %	<0.5	<1.0	TR	<0.5	<0.5	<0.5	<0.5
	Antifreeze %	-		-	-	-	-	-
	Water %	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Insolubles %	0.4	<0.6	0.4	0.4	0.4	0.3	0.5
	TBN							
	TAN							
	ISO Code							

* THIS COLUMN APPLIES ONLY TO THE CURRENT SAMPLE

416 E. PETTIT AVE. FORT WAYNE, IN 46806 (260) 744-2380 www.blackstone-labs.com



OIL REPORT

LAB NUMBER: R30994

UNIT ID: N181MC

REPORT DATE: 7/13/2023

CLIENT ID: 169115

CODE: 1/436

PAYMENT: CC: Visa (Bulk)

UNIT	MAKE/MODEL: Continental IO-550-N68	OIL TYPE & GRADE: Phillips XC (A/C) 20W/50
	FUEL TYPE: Gasoline (Leaded)	OIL USE INTERVAL: 50 Hours
	ADDITIONAL INFO: Cirrus SR22, S/N: 1036520, 4720	

CLIENT	RICK MCCOMB / JIM ODENWALDT/ DANIEL ST	PHONE: (703) 443-4739
	FLY ADVANCED WINCHESTER	FAX:
	509 AIRPORT RD	ALT PHONE: (508) 633-2495
	SUITE 109	EMAIL: rmccomb@flyadvanced.com,
	WINCHESTER, VA 22602	jodenwaldt@flyadvanced.com,

COMMENTS
 RICK: It's almost a clean report, and the only reason it's not isn't cause for concern. The flashpoint was just low enough to show a harmless trace of fuel, which could be from priming or a short ground run before collecting the sample. Nothing about the low wear and blow-by would point to a mechanical issue, and the oil held up well (see viscosity). Nice work.

ELEMENTS IN PARTS PER MILLION	MI/HR on Oil	50	UNIT / LOCATION AVERAGES	50	50	50	50	38	UNIVERSAL AVERAGES
	MI/HR on Unit			1,383	1,333	903	852	804	
	Sample Date	6/19/2023		5/19/2023	2/28/2023	10/5/2021	8/16/2021	7/15/2021	
	Make Up Oil Added								
ALUMINUM	5	10	7	12	8	9	6	7	
CHROMIUM	10	12	15	16	13	15	9	11	
IRON	39	48	53	63	51	57	38	50	
COPPER	2	5	5	9	3	5	2	5	
LEAD	5897	6095	6827	6129	6946	7098	5028	5703	
TIN	1	1	1	1	1	1	1	2	
MOLYBDENUM	5	6	7	10	7	7	4	5	
NICKEL	12	12	16	14	14	20	6	11	
MANGANESE	0	1	1	1	1	1	1	1	
SILVER	0	0	0	0	0	0	0	0	
TITANIUM	0	0	0	0	0	1	0	0	
POTASSIUM	0	0	0	0	0	0	0	0	
BORON	2	1	0	1	1	1	0	1	
SILICON	5	8	7	12	4	4	4	6	
SODIUM	2	2	1	2	1	2	2	2	
CALCIUM	1	2	1	2	0	0	0	26	
MAGNESIUM	0	0	0	0	0	0	0	1	
PHOSPHORUS	3	196	17	225	0	2	0	193	
ZINC	1	3	2	2	2	3	1	4	
BARIUM	0	0	0	0	0	0	0	0	

Values Should Be*

PROPERTIES	SUS Viscosity @ 210°F	90.1	86-105	87.6	92.1	90.9	89.5	91.4
	cSt Viscosity @ 100°C	18.01	17.0-21.8	17.41	18.48	18.20	17.85	18.32
	Flashpoint in °F	430	>430	455	440	450	445	440
	Fuel %	TR	<1.0	<0.5	<0.5	<0.5	<0.5	<0.5
	Antifreeze %	-		-	-	-	-	-
	Water %	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Insolubles %	0.4	<0.6	0.4	0.4	0.3	0.5	0.3
	TBN							
	TAN							
	ISO Code							

* THIS COLUMN APPLIES ONLY TO THE CURRENT SAMPLE

416 E. PETTIT AVE. FORT WAYNE, IN 46806 (260) 744-2380 www.blackstone-labs.com



OIL REPORT

LAB NUMBER: R17738
 REPORT DATE: 6/9/2023
 CODE: 1/436

UNIT ID: N181MC
 CLIENT ID: 169115
 PAYMENT: CC: Visa (Bulk)

UNIT	MAKE/MODEL: Continental IO-550-N68	OIL TYPE & GRADE: Phillips XC (A/C) 20W/50
	FUEL TYPE: Gasoline (Leaded)	OIL USE INTERVAL: 50 Hours
	ADDITIONAL INFO: Cirrus SR22, S/N: 1036520, 4720	

CLIENT	RICK MCCOMB / JIM ODENWALDT/ DANIEL ST	PHONE: (703) 443-4739
	FLY ADVANCED WINCHESTER	FAX:
	509 AIRPORT RD	ALT PHONE: (508) 633-2495
	SUITE 109	EMAIL: rmccomb@flyadvanced.com,
	WINCHESTER, VA 22602	jodenwaldt@flyadvanced.com,

COMMENTS
 RICK: With silicon back on the way down and everything else looking good, this engine doesn't leave us with much to talk about for this sample. There's nothing in this data that looks like a problem, and no contamination turned up. Very nice.

ELEMENTS IN PARTS PER MILLION	MI/HR on Oil	50	UNIT / LOCATION AVERAGES	50	50	50	38	47	UNIVERSAL AVERAGES
	MI/HR on Unit	1,383		1,333	903	852	804	766	
	Sample Date	5/19/2023		2/28/2023	10/5/2021	8/16/2021	7/15/2021	6/17/2021	
	Make Up Oil Added								
ALUMINUM	7	10	12	8	9	6	9	7	
CHROMIUM	15	12	16	13	15	9	11	11	
IRON	53	48	63	51	57	38	47	50	
COPPER	5	5	9	3	5	2	4	5	
LEAD	6827	6095	6129	6946	7098	5028	6585	5703	
TIN	1	1	1	1	1	1	0	2	
MOLYBDENUM	7	6	10	7	7	4	6	5	
NICKEL	16	12	14	14	20	6	10	11	
MANGANESE	1	1	1	1	1	1	1	1	
SILVER	0	0	0	0	0	0	0	0	
TITANIUM	0	0	0	0	1	0	0	0	
POTASSIUM	0	0	0	0	0	0	0	0	
BORON	0	1	1	1	1	0	1	1	
SILICON	7	8	12	4	4	4	5	6	
SODIUM	1	2	2	1	2	2	1	2	
CALCIUM	1	2	2	0	0	0	1	26	
MAGNESIUM	0	0	0	0	0	0	0	1	
PHOSPHORUS	17	196	225	0	2	0	4	193	
ZINC	2	3	2	2	3	1	2	4	
BARIUM	0	0	0	0	0	0	0	0	

Values Should Be*

PROPERTIES	SUS Viscosity @ 210°F	87.6	86-105	92.1	90.9	89.5	91.4	92.5
	cSt Viscosity @ 100°C	17.41	17.0-21.8	18.48	18.20	17.85	18.32	18.59
	Flashpoint in °F	455	>430	440	450	445	440	480
	Fuel %	<0.5	<1.0	<0.5	<0.5	<0.5	<0.5	<0.5
	Antifreeze %	-	-	-	-	-	-	-
	Water %	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Insolubles %	0.4	<0.6	0.4	0.3	0.5	0.3	0.4
	TBN							
	TAN							
	ISO Code							

* THIS COLUMN APPLIES ONLY TO THE CURRENT SAMPLE

416 E. PETTIT AVE. FORT WAYNE, IN 46806 (260) 744-2380 www.blackstone-labs.com



OIL REPORT

LAB NUMBER:
 REPORT DATE: 3/16/2023
 CODE: 1/37

UNIT ID:
 CLIENT ID:
 PAYMENT:

UNIT	EQUIP. MAKE/MODEL: Continental IO-550-N68	OIL TYPE & GRADE: Phillips XC (A/C) 20W/50
	FUEL TYPE: Gasoline (Leaded)	OIL USE INTERVAL: 50 Hours
	ADDITIONAL INFO: Cirrus SR22, S/N: 1036520, 4720	

CLIENT	PHONE:
	FAX:
	ALT PHONE:
	EMAIL:

COMMENTS
 Silicon increased a little in this sample, so just give the air filter/intake a quick peek to look for leaks or issues in case dirt contamination is to blame. The wear metals did nudge up a little compared to previous samples, and dirt could certainly be a factor in some of that. No fuel/water turned up. Still a good report, but we'll be interested to see if bringing silicon down a bit helps a little with the metal counts.

ELEMENTS IN PARTS PER MILLION	MI/HR on Oil	50	UNIT / LOCATION AVERAGES					UNIVERSAL AVERAGES
	MI/HR on Unit	1,333	903	852	804	766	719	
	Sample Date	2/28/2023	10/5/2021	8/16/2021	7/15/2021	6/17/2021	5/6/2021	
	Make Up Oil Added							
ALUMINIUM	12	10	8	9	6	9	8	7
CHROMIUM	16	12	13	15	9	11	9	11
IRON	63	48	51	57	38	47	34	50
COPPER	9	5	3	5	2	4	6	5
LEAD	6129	6095	6946	7098	5028	6585	4311	5703
TIN	1	1	1	1	1	0	1	2
MOLYBDENUM	10	6	7	7	4	6	5	5
NICKEL	14	12	14	20	6	10	10	11
MANGANESE	1	1	1	1	1	1	1	1
SILVER	0	0	0	0	0	0	0	0
TITANIUM	0	0	0	1	0	0	0	0
POTASSIUM	0	0	0	0	0	0	0	0
BORON	1	1	1	1	0	1	0	1
SILICON	12	8	4	4	4	5	5	6
SODIUM	2	2	1	2	2	1	3	2
CALCIUM	2	2	0	0	0	1	1	26
MAGNESIUM	0	0	0	0	0	0	0	1
PHOSPHORUS	225	196	0	2	0	4	1	193
ZINC	2	3	2	3	1	2	2	4
BARIUM	0	0	0	0	0	0	0	0

Values
Should Be*

PROPERTIES	SUS Viscosity @ 210°F	92.1	86-105	90.9	89.5	91.4	92.5	83.2
	cSt Viscosity @ 100°C	18.48	17.0-21.8	18.20	17.85	18.32	18.59	16.32
	Flashpoint in °F	440	>430	450	445	440	480	445
	Fuel %	<0.5	<1.0	<0.5	<0.5	<0.5	<0.5	<0.5
	Antifreeze %	-		-	-	-	-	-
	Water %	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Insolubles %	0.4	<0.6	0.3	0.5	0.3	0.4	0.3
	TBN							
	TAN							
ISO Code								

* THIS COLUMN APPLIES ONLY TO THE CURRENT SAMPLE

416 E. PETTIT AVE. FORT WAYNE, IN 46806 (260) 744-2380 www.blackstone-labs.com



OIL REPORT

LAB NUMBER:
 REPORT DATE: 10/21/2021
 CODE: 1/75

UNIT ID:
 CLIENT ID:
 PAYMENT:

UNIT	EQUIP. MAKE/MODEL: Continental IO-550-N68	OIL TYPE & GRADE: Phillips XC (A/C) 20W/50
	FUEL TYPE: Gasoline (Leaded)	OIL USE INTERVAL: 50 Hours
	ADDITIONAL INFO: Cirrus SR22, S/N: 1036520, 4720	

CLIENT	PHONE:
	FAX:
	ALT PHONE:
	EMAIL:

COMMENTS
 Nice one! Metals inched down a bit this time after a similar oil run, and that's always a good sign when it comes to oil analysis. We also like steady wear, but we'll take less wear whenever we can get it. Anyway, we don't have any reason to suspect trouble based on this data. The oil itself was also in good shape, as the viscosity was correct for 20W/50 and no significant contamination was found. Nice report.

ELEMENTS IN PARTS PER MILLION	MI/HR on Oil	50	UNIT / LOCATION AVERAGES	50	38	47	25		UNIVERSAL AVERAGES
	MI/HR on Unit	903		852	804	766	719	698	
	Sample Date	10/5/2021		8/16/2021	7/15/2021	6/17/2021	5/6/2021	4/19/2021	
	Make Up Oil Added								
ALUMINIUM	8	10	9	6	9	8	20	7	
CHROMIUM	13	12	15	9	11	9	16	11	
IRON	51	48	57	38	47	34	65	50	
COPPER	3	5	5	2	4	6	5	5	
LEAD	6946	6095	7098	5028	6585	4311	7786	5703	
TIN	1	1	1	1	0	1	1	2	
MOLYBDENUM	7	6	7	4	6	5	8	5	
NICKEL	14	12	20	6	10	10	17	11	
MANGANESE	1	1	1	1	1	1	1	1	
SILVER	0	0	0	0	0	0	0	0	
TITANIUM	0	0	1	0	0	0	1	0	
POTASSIUM	0	0	0	0	0	0	0	0	
BORON	1	1	1	0	1	0	1	1	
SILICON	4	8	4	4	5	5	4	6	
SODIUM	1	2	2	2	1	3	2	2	
CALCIUM	0	2	0	0	1	1	0	26	
MAGNESIUM	0	0	0	0	0	0	0	1	
PHOSPHORUS	0	196	2	0	4	1	1	193	
ZINC	2	3	3	1	2	2	3	4	
BARIUM	0	0	0	0	0	0	0	0	

Values
Should Be*

PROPERTIES	SUS Viscosity @ 210°F	90.9	86-105	89.5	91.4	92.5	83.2	96.2
	cSt Viscosity @ 100°C	18.20	17.0-21.8	17.85	18.32	18.59	16.32	19.46
	Flashpoint in °F	450	>430	445	440	480	445	465
	Fuel %	<0.5	<1.0	<0.5	<0.5	<0.5	<0.5	<0.5
	Antifreeze %	-		-	-	-	-	-
	Water %	0.0	0.0	0.0	0.0	0.0	0.0	POS
	Insolubles %	0.3	<0.6	0.5	0.3	0.4	0.3	0.6
	TBN							
	TAN							
ISO Code								

* THIS COLUMN APPLIES ONLY TO THE CURRENT SAMPLE

416 E. PETTIT AVE. FORT WAYNE, IN 46806 (260) 744-2380 www.blackstone-labs.com



OIL REPORT

LAB NUMBER: N80833
 REPORT DATE: 9/1/2021
 CODE: 1/75

UNIT ID: N181MC
 CLIENT ID: 169115
 PAYMENT: CC: MC (Bulk)

UNIT	MAKE/MODEL: Continental IO-550-N68	OIL TYPE & GRADE: Phillips XC (A/C) 20W/50
	FUEL TYPE: Gasoline (Leaded)	OIL USE INTERVAL: 50 Hours
	ADDITIONAL INFO: Cirrus SR22, S/N: 1036520, 4720	

CLIENT	RICK MCCOMB / JIM ODENWALDT/ DANIEL ST	PHONE: (703) 443-4739
	FLY ADVANCED WINCHESTER	FAX:
	509 AIRPORT RD	ALT PHONE: (508) 633-2495
	SUITE 109	EMAIL: rmccomb@flyadvanced.com,
	WINCHESTER, VA 22602	jodenwaldt@flyadvanced.com,

COMMENTS
 DUSTIN: This oil run was about 12 hours longer than the last, and the engine handled it well. Metals and blow-by are still in great shape on a per-hour basis. Iron and lead are even a bit low on a per-hour basis, and we didn't find contamination that would bring the healthy wear trends to a halt anytime soon. Low insolubles show the oil filter wasn't used up. This engine is doing better than okay at 852 hours.

ELEMENTS IN PARTS PER MILLION	MI/HR on Oil	50	UNIT / LOCATION AVERAGES	38	47	25		50	UNIVERSAL AVERAGES
	MI/HR on Unit	852		804	766	719	698	590	
	Sample Date	8/16/2021		7/15/2021	6/17/2021	5/6/2021	4/19/2021	2/8/2021	
	Make Up Oil Added								
ALUMINUM	9	10	6	9	8	20	11	7	
CHROMIUM	15	12	9	11	9	16	13	11	
IRON	57	48	38	47	34	65	54	50	
COPPER	5	5	2	4	6	5	5	5	
LEAD	7098	6095	5028	6585	4311	7786	7047	5703	
TIN	1	1	1	0	1	1	1	2	
MOLYBDENUM	7	6	4	6	5	8	7	5	
NICKEL	20	12	6	10	10	17	18	11	
MANGANESE	1	1	1	1	1	1	1	1	
SILVER	0	0	0	0	0	0	0	0	
TITANIUM	1	0	0	0	0	1	1	0	
POTASSIUM	0	0	0	0	0	0	0	0	
BORON	1	1	0	1	0	1	1	1	
SILICON	4	8	4	5	5	4	4	6	
SODIUM	2	2	2	1	3	2	2	2	
CALCIUM	0	2	0	1	1	0	1	26	
MAGNESIUM	0	0	0	0	0	0	0	1	
PHOSPHORUS	2	196	0	4	1	1	0	193	
ZINC	3	3	1	2	2	3	2	4	
BARIUM	0	0	0	0	0	0	0	0	

Values Should Be*

PROPERTIES	SUS Viscosity @ 210°F	89.5	86-105	91.4	92.5	83.2	96.2	89.0
	cSt Viscosity @ 100°C	17.85	17.0-21.8	18.32	18.59	16.32	19.46	17.73
	Flashpoint in °F	445	>430	440	480	445	465	460
	Fuel %	<0.5	<1.0	<0.5	<0.5	<0.5	<0.5	<0.5
	Antifreeze %	-		-	-	-	-	-
	Water %	0.0	0.0	0.0	0.0	0.0	POS	0.0
	Insolubles %	0.5	<0.6	0.3	0.4	0.3	0.6	0.4
	TBN							
	TAN							
	ISO Code							

* THIS COLUMN APPLIES ONLY TO THE CURRENT SAMPLE

416 E. PETTIT AVE. FORT WAYNE, IN 46806 (260) 744-2380 www.blackstone-labs.com



OIL REPORT

LAB NUMBER: N67759

UNIT ID: N181MC

REPORT DATE: 7/27/2021

CLIENT ID: 169115

CODE: 1/75

PAYMENT: CC: Visa (Bulk)

UNIT	MAKE/MODEL: Continental IO-550-N68	OIL TYPE & GRADE: Phillips XC (A/C) 20W/50
	FUEL TYPE: Gasoline (Leaded)	OIL USE INTERVAL: 38 Hours
	ADDITIONAL INFO: Cirrus SR22, S/N: 1036520, 4720	

CLIENT	RICK MCCOMB / JIM ODENWALDT/ DANIEL ST	PHONE: (703) 443-4739
	FLY ADVANCED WINCHESTER	FAX:
	509 AIRPORT RD	ALT PHONE: (508) 633-2495
	SUITE 109	EMAIL: rmccomb@flyadvanced.com,
	WINCHESTER, VA 22602	jodenwaldt@flyadvanced.com,

COMMENTS DUSTIN: We're assuming this oil was in use for about 38 hours based on the change in engine hours, but let us know if that should be updated. Even if this oil wasn't in use all that long, though, the levels of wear metals wouldn't raise any alarms. Most are lower than they were last time, and all compare well to universal averages for the IO-550-N68. They're in a good balance with one another, too. This engine has been putting up good results ever since the cylinder replacement, so we'll just want to see more of the same going forward.

ELEMENTS IN PARTS PER MILLION	MI/HR on Oil	38	UNIT / LOCATION AVERAGES	47	25		50	50	UNIVERSAL AVERAGES
	MI/HR on Unit	804		766	719	698	590	550	
	Sample Date	7/15/2021		6/17/2021	5/6/2021	4/19/2021	2/8/2021	11/23/2020	
	Make Up Oil Added								
ALUMINUM	6	10	9	8	20	11	14	7	
CHROMIUM	9	12	11	9	16	13	14	11	
IRON	38	48	47	34	65	54	56	50	
COPPER	2	5	4	6	5	5	6	5	
LEAD	5028	6095	6585	4311	7786	7047	7839	5703	
TIN	1	1	0	1	1	1	2	2	
MOLYBDENUM	4	6	6	5	8	7	8	5	
NICKEL	6	12	10	10	17	18	12	11	
MANGANESE	1	1	1	1	1	1	1	1	
SILVER	0	0	0	0	0	0	0	0	
TITANIUM	0	0	0	0	1	1	0	0	
POTASSIUM	0	0	0	0	0	0	0	0	
BORON	0	1	1	0	1	1	4	1	
SILICON	4	8	5	5	4	4	3	6	
SODIUM	2	2	1	3	2	2	3	2	
CALCIUM	0	2	1	1	0	1	1	26	
MAGNESIUM	0	0	0	0	0	0	0	1	
PHOSPHORUS	0	196	4	1	1	0	1	193	
ZINC	1	3	2	2	3	2	2	4	
BARIUM	0	0	0	0	0	0	0	0	

Values Should Be*

PROPERTIES	SUS Viscosity @ 210°F	91.4	86-105	92.5	83.2	96.2	89.0	89.5
	cSt Viscosity @ 100°C	18.32	17.0-21.8	18.59	16.32	19.46	17.73	17.87
	Flashpoint in °F	440	>430	480	445	465	460	470
	Fuel %	<0.5	<1.0	<0.5	<0.5	<0.5	<0.5	<0.5
	Antifreeze %	-		-	-	-	-	-
	Water %	0.0	0.0	0.0	0.0	POS	0.0	0.0
	Insolubles %	0.3	<0.6	0.4	0.3	0.6	0.4	0.4
	TBN							
	TAN							
	ISO Code							

* THIS COLUMN APPLIES ONLY TO THE CURRENT SAMPLE

416 E. PETTIT AVE. FORT WAYNE, IN 46806 (260) 744-2380 www.blackstone-labs.com



OIL REPORT

LAB NUMBER: N60285

UNIT ID: N181MC

REPORT DATE: 7/7/2021

CLIENT ID: 169115

CODE: 1/75

PAYMENT: CC: Visa (Bulk)

UNIT	MAKE/MODEL: Continental IO-550-N68	OIL TYPE & GRADE: Phillips XC (A/C) 20W/50
	FUEL TYPE: Gasoline (Leaded)	OIL USE INTERVAL: 47 Hours
	ADDITIONAL INFO: Cirrus SR22, S/N: 1036520, 4720	

CLIENT	RICK MCCOMB / JIM ODENWALDT/ DANIEL ST	PHONE: (703) 443-4739
	FLY ADVANCED WINCHESTER	FAX:
	509 AIRPORT RD	ALT PHONE: (508) 633-2495
	SUITE 109	EMAIL: rmccomb@flyadvanced.com,
	WINCHESTER, VA 22602	jodenwaldt@flyadvanced.com,

COMMENTS DUSTIN: We calculated 47 hours on the oil, but just let us know if that's not right. This IO-550 is looking good 68.7 hours out from the cylinder replacement. Cylinder-area metals (aluminum, chrome, iron) are all within the normal range for this type of engine, so we're not seeing any signs of trouble related to wear-in of the new jug. It's okay that levels aren't as low as they were last time -- the minor increases are likely just a result of the longer oil run. No contamination was found, and the viscosity tested within the expected range. Nice report, N181MC!

ELEMENTS IN PARTS PER MILLION	MI/HR on Oil	47	UNIT / LOCATION AVERAGES	25		50	50	39	UNIVERSAL AVERAGES
	MI/HR on Unit	766		719	698	590	550	500	
	Sample Date	6/17/2021		5/6/2021	4/19/2021	2/8/2021	11/23/2020	9/22/2020	
	Make Up Oil Added								
ALUMINUM	9	10	8	20	11	14	6	7	
CHROMIUM	11	12	9	16	13	14	12	11	
IRON	47	48	34	65	54	56	47	50	
COPPER	4	5	6	5	5	6	5	5	
LEAD	6585	6095	4311	7786	7047	7839	6785	5703	
TIN	0	1	1	1	1	2	1	2	
MOLYBDENUM	6	6	5	8	7	8	6	5	
NICKEL	10	12	10	17	18	12	11	11	
MANGANESE	1	1	1	1	1	1	1	1	
SILVER	0	0	0	0	0	0	0	0	
TITANIUM	0	0	0	1	1	0	0	0	
POTASSIUM	0	0	0	0	0	0	0	0	
BORON	1	1	0	1	1	4	0	1	
SILICON	5	8	5	4	4	3	3	6	
SODIUM	1	2	3	2	2	3	1	2	
CALCIUM	1	2	1	0	1	1	1	26	
MAGNESIUM	0	0	0	0	0	0	0	1	
PHOSPHORUS	4	196	1	1	0	1	1	193	
ZINC	2	3	2	3	2	2	2	4	
BARIUM	0	0	0	0	0	0	0	0	

Values Should Be*

PROPERTIES	SUS Viscosity @ 210°F	92.5	86-105	83.2	96.2	89.0	89.5	90.1
	cSt Viscosity @ 100°C	18.59	17.0-21.8	16.32	19.46	17.73	17.87	18.00
	Flashpoint in °F	480	>430	445	465	460	470	440
	Fuel %	<0.5	<1.0	<0.5	<0.5	<0.5	<0.5	<0.5
	Antifreeze %	-		-	-	-	-	-
	Water %	0.0	0.0	0.0	POS	0.0	0.0	0.0
	Insolubles %	0.4	<0.6	0.3	0.6	0.4	0.4	0.2
	TBN							
	TAN							
	ISO Code							

* THIS COLUMN APPLIES ONLY TO THE CURRENT SAMPLE

416 E. PETTIT AVE. FORT WAYNE, IN 46806 (260) 744-2380 www.blackstone-labs.com



OIL REPORT

LAB NUMBER: N42944 UNIT ID: N181MC
 REPORT DATE: 5/18/2021 CLIENT ID: 169115
 CODE: 1/75 PAYMENT: CC: Visa (Bulk)

UNIT	MAKE/MODEL: Continental IO-550-N68	OIL TYPE & GRADE: Phillips (AC) 20W/50 Type M (Mineral)
	FUEL TYPE: Gasoline (Leaded)	OIL USE INTERVAL: 25 Hours
	ADDITIONAL INFO: Cirrus SR22, S/N: 1036520, 4720	

CLIENT	RICK MCCOMB / JIM ODENWALDT/ DANIEL ST	PHONE: (703) 443-4739
	FLY ADVANCED WINCHESTER	FAX:
	509 AIRPORT RD	ALT PHONE: (508) 633-2495
	SUITE 109	EMAIL: rmccomb@flyadvanced.com,
	WINCHESTER, VA 22602	jodenwaldt@flyadvanced.com,

COMMENTS
 DUSTIN: Thanks for noting the #3 cylinder replacement. The way wear metals and silicon are looking, it seems most, if not all of the wear-in material associated with that work has already made its exit. Maybe we have the new cylinder to thank for this lower aluminum reading too. It dropped by more than half, and it brought some of the other metals along with it. Wear levels are all pretty close to average now. There's even more good news down in the physical tests. No water turned up, and insolubles tested at just 0.3%, so the oil filter wasn't used up. Very nice!

	MI/HR on Oil	25	UNIT / LOCATION AVERAGES	50	50	39	51	UNIVERSAL AVERAGES	
	MI/HR on Unit	719		698	590	550	500		460
	Sample Date	5/6/2021		4/19/2021	2/8/2021	11/23/2020	9/22/2020	8/17/2020	
ELEMENTS IN PARTS PER MILLION	Make Up Oil Added								
	ALUMINUM	8	10	20	11	14	6	10	7
	CHROMIUM	9	12	16	13	14	12	16	11
	IRON	34	48	65	54	56	47	63	50
	COPPER	6	5	5	5	6	5	7	5
	LEAD	4311	6095	7786	7047	7839	6785	7992	5703
	TIN	1	1	1	1	2	1	2	2
	MOLYBDENUM	5	6	8	7	8	6	9	5
	NICKEL	10	12	17	18	12	11	15	11
	MANGANESE	1	1	1	1	1	1	1	1
	SILVER	0	0	0	0	0	0	0	0
	TITANIUM	0	0	1	1	0	0	0	0
	POTASSIUM	0	0	0	0	0	0	0	0
	BORON	0	1	1	1	4	0	0	1
	SILICON	5	8	4	4	3	3	4	6
	SODIUM	3	2	2	2	3	1	1	2
	CALCIUM	1	2	0	1	1	1	1	26
	MAGNESIUM	0	0	0	0	0	0	1	1
	PHOSPHORUS	1	196	1	0	1	1	1	193
	ZINC	2	3	3	2	2	2	3	4
	BARIUM	0	0	0	0	0	0	0	0

Values Should Be*

PROPERTIES	SUS Viscosity @ 210°F	83.2	82-105	96.2	89.0	89.5	90.1	92.6
	cSt Viscosity @ 100°C	16.32	16.0-21.8	19.46	17.73	17.87	18.00	18.60
	Flashpoint in °F	445	>425	465	460	470	440	470
	Fuel %	<0.5	<1.0	<0.5	<0.5	<0.5	<0.5	<0.5
	Antifreeze %	-		-	-	-	-	-
	Water %	0.0	0.0	POS	0.0	0.0	0.0	0.0
	Insolubles %	0.3	<0.6	0.6	0.4	0.4	0.2	0.4
	TBN							
	TAN							
	ISO Code							

* THIS COLUMN APPLIES ONLY TO THE CURRENT SAMPLE

416 E. PETTIT AVE. FORT WAYNE, IN 46806 (260) 744-2380 www.blackstone-labs.com



OIL REPORT

LAB NUMBER: N36798

UNIT ID: N181MC

REPORT DATE: 4/30/2021

CLIENT ID: 169115

CODE: 1/75

PAYMENT: CC: Visa (Bulk)

UNIT	MAKE/MODEL: Continental IO-550-N68	OIL TYPE & GRADE: Phillips XC (A/C) 20W/50
	FUEL TYPE: Gasoline (Leaded)	OIL USE INTERVAL: Hours
	ADDITIONAL INFO: Cirrus SR22, S/N: 1036520, 4720	

CLIENT	RICK MCCOMB / JIM ODENWALDT/ DANIEL ST	PHONE: (703) 443-4739
	FLY ADVANCED WINCHESTER	FAX:
	509 AIRPORT RD	ALT PHONE: (508) 633-2495
	SUITE 109	EMAIL: rmccomb@flyadvanced.com,
	WINCHESTER, VA 22602	jodenwaldt@flyadvanced.com,

COMMENTS DUSTIN: Metals are still in pretty good shape on the whole, but aluminum is on the high side now. While it can come from piston wear, in this case it might just show some harmless oxides. This sample tested positive for moisture, which could have acted as a catalyst for that process. Insolubles (solids) are at the 0.6% limit, which could also be due to oxidation. Still, nothing here stands out as a serious issue, so if the oil filter is clean and temps are normal, we'd just suggest checking back at the next service for an update on metals, contamination, and insolubles.

ELEMENTS IN PARTS PER MILLION	MI/HR on Oil		UNIT / LOCATION AVERAGES	50	50	39	51	39	UNIVERSAL AVERAGES
	MI/HR on Unit	698		590	550	500	460	409	
	Sample Date	4/19/2021		2/8/2021	11/23/2020	9/22/2020	8/17/2020	4/9/2020	
	Make Up Oil Added								
ALUMINUM	20	10	11	14	6	10	9	7	
CHROMIUM	16	12	13	14	12	16	16	11	
IRON	65	48	54	56	47	63	62	50	
COPPER	5	5	5	6	5	7	6	5	
LEAD	7786	6095	7047	7839	6785	7992	7844	5703	
TIN	1	1	1	2	1	2	3	2	
MOLYBDENUM	8	6	7	8	6	9	9	5	
NICKEL	17	12	18	12	11	15	19	11	
MANGANESE	1	1	1	1	1	1	1	1	
SILVER	0	0	0	0	0	0	0	0	
TITANIUM	1	0	1	0	0	0	1	0	
POTASSIUM	0	0	0	0	0	0	0	0	
BORON	1	1	1	4	0	0	0	1	
SILICON	4	8	4	3	3	4	5	6	
SODIUM	2	2	2	3	1	1	1	2	
CALCIUM	0	2	1	1	1	1	1	26	
MAGNESIUM	0	0	0	0	0	1	0	1	
PHOSPHORUS	1	196	0	1	1	1	0	193	
ZINC	3	3	2	2	2	3	3	4	
BARIUM	0	0	0	0	0	0	0	0	

Values Should Be*

PROPERTIES	SUS Viscosity @ 210°F	96.2	86-105	89.0	89.5	90.1	92.6	88.9
	cSt Viscosity @ 100°C	19.46	17.0-21.8	17.73	17.87	18.00	18.60	17.72
	Flashpoint in °F	465	>430	460	470	440	470	415
	Fuel %	<0.5	<1.0	<0.5	<0.5	<0.5	<0.5	0.8
	Antifreeze %	-		-	-	-	-	-
	Water %	POS	0.0	0.0	0.0	0.0	0.0	0.0
	Insolubles %	0.6	<0.6	0.4	0.4	0.2	0.4	0.3
	TBN							
	TAN							
	ISO Code							

* THIS COLUMN APPLIES ONLY TO THE CURRENT SAMPLE

416 E. PETTIT AVE. FORT WAYNE, IN 46806 (260) 744-2380 www.blackstone-labs.com



OIL REPORT

LAB NUMBER: N13893

UNIT ID: N181MC

REPORT DATE: 2/23/2021

CLIENT ID: 169115

CODE: 1/68

PAYMENT: CC: Visa

UNIT	MAKE/MODEL: Continental IO-550-N68	OIL TYPE & GRADE: Phillips XC (A/C) 20W/50
	FUEL TYPE: Gasoline (Leaded)	OIL USE INTERVAL: 50 Hours
	ADDITIONAL INFO: Cirrus SR22, S/N: 1036520, 4720	

CLIENT	RICK MCCOMB / JIM ODENWALDT/ DANIEL ST	PHONE: (703) 443-4739
	FLY ADVANCED WINCHESTER	FAX:
	509 AIRPORT RD	ALT PHONE: (508) 633-2495
	SUITE 109	EMAIL: rmccomb@flyadvanced.com,
	WINCHESTER, VA 22602	jodenwaldt@flyadvanced.com,

COMMENTS DUSTIN: This IO-550 is off to a great start in oil analysis. A typical engine of this type looks something like the universal averages column after going about 40 hours on the oil. Metals aren't perfectly matched in this sample, but they're darn close, and that's fine. Universal averages are more of a guide than anything, and we expect a little variation in the wear pattern based on an engine's unique operating conditions. No mechanical problems are evident with wear levels like these. No contamination was found, either. We'll look for more of the same going forward.

ELEMENTS IN PARTS PER MILLION	MI/HR on Oil	50	UNIT / LOCATION AVERAGES	50	39	51	39	54	UNIVERSAL AVERAGES
	MI/HR on Unit	590		550	500	460	409	371	
	Sample Date	2/8/2021		11/23/2020	9/22/2020	8/17/2020	4/9/2020	1/9/2020	
	Make Up Oil Added								
ALUMINUM	11	10	14	6	10	9	7	7	
CHROMIUM	13	12	14	12	16	16	17	11	
IRON	54	48	56	47	63	62	61	50	
COPPER	5	5	6	5	7	6	7	5	
LEAD	7047	6095	7839	6785	7992	7844	8190	5703	
TIN	1	1	2	1	2	3	2	2	
MOLYBDENUM	7	6	8	6	9	9	9	5	
NICKEL	18	12	12	11	15	19	13	11	
MANGANESE	1	1	1	1	1	1	1	1	
SILVER	0	0	0	0	0	0	0	0	
TITANIUM	1	0	0	0	0	1	0	0	
POTASSIUM	0	0	0	0	0	0	0	0	
BORON	1	1	4	0	0	0	1	1	
SILICON	4	8	3	3	4	5	5	6	
SODIUM	2	2	3	1	1	1	1	2	
CALCIUM	1	2	1	1	1	1	2	26	
MAGNESIUM	0	0	0	0	1	0	0	1	
PHOSPHORUS	0	196	1	1	1	0	3	193	
ZINC	2	3	2	2	3	3	3	4	
BARIUM	0	0	0	0	0	0	0	0	

Values Should Be*

PROPERTIES	SUS Viscosity @ 210°F	89.0	86-105	89.5	90.1	92.6	88.9	90.1
	cSt Viscosity @ 100°C	17.73	17.0-21.8	17.87	18.00	18.60	17.72	18.00
	Flashpoint in °F	460	>430	470	440	470	415	450
	Fuel %	<0.5	<1.0	<0.5	<0.5	<0.5	0.8	<0.5
	Antifreeze %	-		-	-	-	-	-
	Water %	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Insolubles %	0.4	<0.6	0.4	0.2	0.4	0.3	0.5
	TBN							
	TAN							
	ISO Code							

* THIS COLUMN APPLIES ONLY TO THE CURRENT SAMPLE

416 E. PETTIT AVE. FORT WAYNE, IN 46806 (260) 744-2380 www.blackstone-labs.com



OIL REPORT

LAB NUMBER: M92861 UNIT ID: N181MC
 REPORT DATE: 12/14/2020 CLIENT ID: 169115
 CODE: 1/16 PAYMENT: Bulk CC

UNIT	MAKE/MODEL: Continental IO-550-N68	OIL TYPE & GRADE: Phillips XC (A/C) 20W/50
	FUEL TYPE: Gasoline (Leaded)	OIL USE INTERVAL: 50 Hours
	ADDITIONAL INFO: Cirrus SR22, S/N: 1036520, 4720	

CLIENT	RICK MCCOMB / JIM ODENWALDT/ DANIEL ST	PHONE: (703) 443-4739
	FLY ADVANCED WINCHESTER	FAX:
	509 AIRPORT RD	ALT PHONE: (508) 633-2495
	SUITE 109	EMAIL: rmccomb@flyadvanced.com,
	WINCHESTER, VA 22602	jodenwaldt@flyadvanced.com,

COMMENTS STEVE/MIKE: Another good report on record for this SR22's engine! Wear metals are pretty steady with past reports. Aluminum is the highest it's been in about a year now and it's just bordering on the twice-average fence, but for the time being, it's just something to keep an eye on, not a surefire piston wear issue or anything like that. With any luck, it will drop back down to the sub-10 ppm readings that are more typical for N181MC next time. The physical properties of the oil were in spec. Even with a little more aluminum in the oil, this is a very nice report!

								UNIVERSAL AVERAGES	
	MI/HR on Oil	50	39	51	39	54	18		
	MI/HR on Unit	550	500	460	409	371	316		
	Sample Date	11/23/2020	9/22/2020	8/17/2020	4/9/2020	1/9/2020	10/16/2019		
	Make Up Oil Added								
ELEMENTS IN PARTS PER MILLION	ALUMINUM	14	10	6	10	9	7	5	7
	CHROMIUM	14	12	12	16	16	17	10	11
	IRON	56	48	47	63	62	61	33	50
	COPPER	6	5	5	7	6	7	4	5
	LEAD	7839	6095	6785	7992	7844	8190	4911	5703
	TIN	2	1	1	2	3	2	2	2
	MOLYBDENUM	8	6	6	9	9	9	5	5
	NICKEL	12	12	11	15	19	13	10	11
	MANGANESE	1	1	1	1	1	1	1	1
	SILVER	0	0	0	0	0	0	0	0
	TITANIUM	0	0	0	0	1	0	0	0
	POTASSIUM	0	0	0	0	0	0	0	0
	BORON	4	1	0	0	0	1	0	1
	SILICON	3	8	3	4	5	5	4	6
	SODIUM	3	2	1	1	1	1	1	2
	CALCIUM	1	2	1	1	1	2	1	26
	MAGNESIUM	0	0	0	1	0	0	0	1
	PHOSPHORUS	1	196	1	1	0	3	2	193
	ZINC	2	3	2	3	3	3	2	4
	BARIUM	0	0	0	0	0	0	0	0

Values Should Be*

PROPERTIES	SUS Viscosity @ 210°F	89.5	86-105	90.1	92.6	88.9	90.1	95.8
	cSt Viscosity @ 100°C	17.87	17.0-21.8	18.00	18.60	17.72	18.00	19.37
	Flashpoint in °F	470	>430	440	470	415	450	480
	Fuel %	<0.5	<1.0	<0.5	<0.5	0.8	<0.5	<0.5
	Antifreeze %	-		-	-	-	-	-
	Water %	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Insolubles %	0.4	<0.6	0.2	0.4	0.3	0.5	0.4
	TBN							
	TAN							
	ISO Code							

* THIS COLUMN APPLIES ONLY TO THE CURRENT SAMPLE

416 E. PETTIT AVE. FORT WAYNE, IN 46806 (260) 744-2380 www.blackstone-labs.com



OIL REPORT

LAB NUMBER: M68375
 REPORT DATE: 10/1/2020
 CODE: 1/16

UNIT ID: N181MC
 CLIENT ID: 169115
 PAYMENT: Bulk CC

UNIT	MAKE/MODEL: Continental IO-550-N68	OIL TYPE & GRADE: Phillips XC (A/C) 20W/50
	FUEL TYPE: Gasoline (Leaded)	OIL USE INTERVAL: 39 Hours
	ADDITIONAL INFO: Cirrus SR22, S/N: 1036520, 4720	

CLIENT	RICK MCCOMB / JIM ODENWALDT/ DANIEL ST	PHONE: (703) 443-4739
	FLY ADVANCED WINCHESTER	FAX:
	509 AIRPORT RD	ALT PHONE: (508) 633-2495
	SUITE 109	EMAIL: rmccomb@flyadvanced.com,
	WINCHESTER, VA 22602	jodenwaldt@flyadvanced.com,

COMMENTS
 STEVE/MIKE: This is another great report for the IO-550 powering N181MC. Wear metals are at some of their lowest levels on the page after these latest 39 hours and that's a great sign this engine is getting on just fine. Blow-by looks good, and there was no measurable fuel or water noted in this sample of 20W/50. Keep up the nice work with this Cirrus!

	MI/HR on Oil	39	UNIT / LOCATION AVERAGES	51	39	54	18	80	UNIVERSAL AVERAGES
	MI/HR on Unit	500		460	409	371	316	298	
	Sample Date	9/22/2020		8/17/2020	4/9/2020	1/9/2020	10/16/2019	9/26/2019	
ELEMENTS IN PARTS PER MILLION	Make Up Oil Added								
	ALUMINUM	6	10	10	9	7	5	13	7
	CHROMIUM	12	12	16	16	17	10	23	11
	IRON	47	48	63	62	61	33	90	50
	COPPER	5	5	7	6	7	4	9	5
	LEAD	6785	6095	7992	7844	8190	4911	9175	5703
	TIN	1	1	2	3	2	2	3	2
	MOLYBDENUM	6	6	9	9	9	5	15	5
	NICKEL	11	12	15	19	13	10	18	11
	MANGANESE	1	1	1	1	1	1	1	1
	SILVER	0	0	0	0	0	0	0	0
	TITANIUM	0	0	0	1	0	0	1	0
	POTASSIUM	0	0	0	0	0	0	0	0
	BORON	0	1	0	0	1	0	0	1
	SILICON	3	8	4	5	5	4	7	6
	SODIUM	1	2	1	1	1	1	1	2
	CALCIUM	1	2	1	1	2	1	2	26
	MAGNESIUM	0	0	1	0	0	0	1	1
	PHOSPHORUS	1	196	1	0	3	2	3	193
	ZINC	2	3	3	3	3	2	4	4
	BARIUM	0	0	0	0	0	0	0	0

Values Should Be*

PROPERTIES	SUS Viscosity @ 210°F	90.1	86-105	92.6	88.9	90.1	95.8	99.3
	cSt Viscosity @ 100°C	18.00	17.0-21.8	18.60	17.72	18.00	19.37	20.19
	Flashpoint in °F	440	>430	470	415	450	480	465
	Fuel %	<0.5	<1.0	<0.5	0.8	<0.5	<0.5	<0.5
	Antifreeze %	-		-	-	-	-	-
	Water %	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Insolubles %	0.2	<0.6	0.4	0.3	0.5	0.4	0.4
	TBN							
	TAN							
	ISO Code							

* THIS COLUMN APPLIES ONLY TO THE CURRENT SAMPLE

416 E. PETTIT AVE. FORT WAYNE, IN 46806 (260) 744-2380 www.blackstone-labs.com



OIL REPORT

LAB NUMBER: M60811
 REPORT DATE: 9/9/2020
 CODE: 1/16

UNIT ID: N181MC
 CLIENT ID: 169115
 PAYMENT: Bulk CC

UNIT	MAKE/MODEL: Continental IO-550-N68	OIL TYPE & GRADE: Phillips XC (A/C) 20W/50
	FUEL TYPE: Gasoline (Leaded)	OIL USE INTERVAL: 51 Hours
	ADDITIONAL INFO: Cirrus SR22, S/N: 1036520, 4720	

CLIENT	RICK MCCOMB / JIM ODENWALDT/ DANIEL ST	PHONE: (703) 443-4739
	FLY ADVANCED WINCHESTER	FAX:
	509 AIRPORT RD	ALT PHONE: (508) 633-2495
	SUITE 109	EMAIL: rmccomb@flyadvanced.com,
	WINCHESTER, VA 22602	jodenwaldt@flyadvanced.com,

COMMENTS
 STEVE/MIKE: Nice report for this SR-22. We mentioned nickel last time since it was a pinch higher than usual - it's nice to see it dropping back to a familiar level, especially after a longer run. Nickel's trend shows exhaust valve guides are doing just fine. Other metals look great, so we really don't have any wear-related concerns to speak of. The flashpoint of this sample is 470°F, high enough to rule out any measurable fuel. The 0.8% last time must've been from something temporary (like priming). Keep up the great work with N181MC!

ELEMENTS IN PARTS PER MILLION	UNIT / LOCATION AVERAGES		VALUES					UNIVERSAL AVERAGES
	MI/HR on Oil	MI/HR on Unit	4/9/2020	1/9/2020	10/16/2019	9/26/2019	7/2/2019	
ALUMINUM	10	10	9	7	5	13	4	7
CHROMIUM	16	12	16	17	10	23	9	11
IRON	63	48	62	61	33	90	26	50
COPPER	7	5	6	7	4	9	3	5
LEAD	7992	6095	7844	8190	4911	9175	3197	5703
TIN	2	1	3	2	2	3	0	2
MOLYBDENUM	9	6	9	9	5	15	4	5
NICKEL	15	12	19	13	10	18	7	11
MANGANESE	1	1	1	1	1	1	0	1
SILVER	0	0	0	0	0	0	0	0
TITANIUM	0	0	1	0	0	1	0	0
POTASSIUM	0	0	0	0	0	0	0	0
BORON	0	1	0	1	0	0	1	1
SILICON	4	8	5	5	4	7	6	6
SODIUM	1	2	1	1	1	1	1	2
CALCIUM	1	2	1	2	1	2	1	26
MAGNESIUM	1	0	0	0	0	1	1	1
PHOSPHORUS	1	196	0	3	2	3	12	193
ZINC	3	3	3	3	2	4	2	4
BARIUM	0	0	0	0	0	0	0	0

Values Should Be*

PROPERTIES	VALUES	VALUES SHOULD BE*	88.9	90.1	95.8	99.3	92.4
SUS Viscosity @ 210°F	92.6	86-105	88.9	90.1	95.8	99.3	92.4
cSt Viscosity @ 100°C	18.60	17.0-21.8	17.72	18.00	19.37	20.19	18.55
Flashpoint in °F	470	>430	415	450	480	465	450
Fuel %	<0.5	<1.0	0.8	<0.5	<0.5	<0.5	<0.5
Antifreeze %	-	-	-	-	-	-	-
Water %	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Insolubles %	0.4	<0.6	0.3	0.5	0.4	0.4	0.4
TBN							
TAN							
ISO Code							

* THIS COLUMN APPLIES ONLY TO THE CURRENT SAMPLE

416 E. PETTIT AVE. FORT WAYNE, IN 46806 (260) 744-2380 www.blackstone-labs.com



OIL REPORT

LAB NUMBER: M23540
 REPORT DATE: 5/6/2020
 CODE: 1/16

UNIT ID: N181MC
 CLIENT ID: 169115
 PAYMENT: Bulk CC

UNIT	MAKE/MODEL: Continental IO-550-N68	OIL TYPE & GRADE: Phillips XC (A/C) 20W/50
	FUEL TYPE: Gasoline (Leaded)	OIL USE INTERVAL: 39 Hours
	ADDITIONAL INFO: Cirrus SR22, S/N: 1036520, 4720	

CLIENT	RICK MCCOMB / JIM ODENWALDT/ DANIEL ST	PHONE: (703) 443-4739
	FLY ADVANCED WINCHESTER	FAX:
	509 AIRPORT RD	ALT PHONE: (508) 633-2495
	SUITE 109	EMAIL: rmccomb@flyadvanced.com,
	WINCHESTER, VA 22602	jodenwaldt@flyadvanced.com,

COMMENTS STEVE/MIKE: N181MC continues to put up stellar results. The only mark this time is for the flashpoint, but that 415°F reading translates to only a harmless 0.8% fuel dilution, and that will probably end up going away on its own. Metals are holding nice and steady on the whole, though nickel did edge up a bit. Still, 19 ppm is a healthy level of wear for nickel parts like exhaust valve guides, so that's just a minor point of note that we'll check on next time. The viscosity is in spec for 20W/50, so the oil didn't get too thin even with a little fuel in the mix. Nice report!

	MI/HR on Oil	39	UNIT / LOCATION AVERAGES	54	18	80			UNIVERSAL AVERAGES
	MI/HR on Unit	409		371	316	298	218	207	
	Sample Date	4/9/2020		1/9/2020	10/16/2019	9/26/2019	7/2/2019	6/5/2019	
ELEMENTS IN PARTS PER MILLION	Make Up Oil Added								
	ALUMINUM	9	10	7	5	13	4	8	7
	CHROMIUM	16	12	17	10	23	9	17	11
	IRON	62	48	61	33	90	26	49	50
	COPPER	6	5	7	4	9	3	9	5
	LEAD	7844	6095	8190	4911	9175	3197	7335	5703
	TIN	3	1	2	2	3	0	1	2
	MOLYBDENUM	9	6	9	5	15	4	8	5
	NICKEL	19	12	13	10	18	7	9	11
	MANGANESE	1	1	1	1	1	0	1	1
	SILVER	0	0	0	0	0	0	0	0
	TITANIUM	1	0	0	0	1	0	0	0
	POTASSIUM	0	0	0	0	0	0	0	0
	BORON	0	1	1	0	0	1	0	1
	SILICON	5	8	5	4	7	6	15	6
	SODIUM	1	2	1	1	1	1	1	2
	CALCIUM	1	2	2	1	2	1	2	26
	MAGNESIUM	0	0	0	0	1	1	0	1
	PHOSPHORUS	0	196	3	2	3	12	66	193
	ZINC	3	3	3	2	4	2	3	4
	BARIUM	0	0	0	0	0	0	0	0

Values Should Be*

PROPERTIES	SUS Viscosity @ 210°F	88.9	86-105	90.1	95.8	99.3	92.4	91.7
	cSt Viscosity @ 100°C	17.72	17.0-21.8	18.00	19.37	20.19	18.55	18.39
	Flashpoint in °F	415	>430	450	480	465	450	450
	Fuel %	0.8	<1.0	<0.5	<0.5	<0.5	<0.5	<0.5
	Antifreeze %	-		-	-	-	-	-
	Water %	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Insolubles %	0.3	<0.6	0.5	0.4	0.4	0.4	0.3
	TBN							
	TAN							
	ISO Code							

* THIS COLUMN APPLIES ONLY TO THE CURRENT SAMPLE

416 E. PETTIT AVE. FORT WAYNE, IN 46806 (260) 744-2380 www.blackstone-labs.com



OIL REPORT

LAB NUMBER: L96009
 REPORT DATE: 1/24/2020
 CODE: 1/16

UNIT ID: N181MC
 CLIENT ID: 169115
 PAYMENT: Bulk CC

UNIT	MAKE/MODEL: Continental IO-550-N68	OIL TYPE & GRADE: Phillips XC (A/C) 20W/50
	FUEL TYPE: Gasoline (Leaded)	OIL USE INTERVAL: 54 Hours
	ADDITIONAL INFO: Cirrus SR22, S/N: 1036520, 4720	

CLIENT	RICK MCCOMB / JIM ODENWALDT/ DANIEL ST	PHONE: (703) 443-4739
	FLY ADVANCED WINCHESTER	FAX:
	509 AIRPORT RD	ALT PHONE: (508) 633-2495
	SUITE 109	EMAIL: rmccomb@flyadvanced.com,
	WINCHESTER, VA 22602	jodenwaldt@flyadvanced.com,

COMMENTS STEVE/MIKE: Another good one! Metals have mostly gone up since last time, but that's a pretty natural occurrence given that this oil change interval was about three times as long. These levels are right in line with what we'd expect from a healthy engine that's put over 50 hours on the oil, so there isn't anything to suggest a mechanical problem is in the works. There's no trouble with contamination either - we didn't come across any signs of fuel, water, or dirt. The viscosity is on target for a 20W/50. All around, nice results.

	MI/HR on Oil	54	UNIT / LOCATION AVERAGES	18	80				UNIVERSAL AVERAGES
	MI/HR on Unit	371		316	298	218	207	155	
	Sample Date	1/9/2020		10/16/2019	9/26/2019	7/2/2019	6/5/2019	5/2/2019	
	Make Up Oil Added								
ELEMENTS IN PARTS PER MILLION	ALUMINUM	7	10	5	13	4	8	10	7
	CHROMIUM	17	12	10	23	9	17	23	11
	IRON	61	48	33	90	26	49	63	50
	COPPER	7	5	4	9	3	9	11	5
	LEAD	8190	6095	4911	9175	3197	7335	7794	5703
	TIN	2	1	2	3	0	1	3	2
	MOLYBDENUM	9	6	5	15	4	8	11	5
	NICKEL	13	12	10	18	7	9	8	11
	MANGANESE	1	1	1	1	0	1	1	1
	SILVER	0	0	0	0	0	0	0	0
	TITANIUM	0	0	0	1	0	0	0	0
	POTASSIUM	0	0	0	0	0	0	1	0
	BORON	1	1	0	0	1	0	0	1
	SILICON	5	8	4	7	6	15	11	6
	SODIUM	1	2	1	1	1	1	1	2
	CALCIUM	2	2	1	2	1	2	8	26
	MAGNESIUM	0	0	0	1	1	0	1	1
	PHOSPHORUS	3	196	2	3	12	66	3	193
	ZINC	3	3	2	4	2	3	6	4
	BARIUM	0	0	0	0	0	0	0	0

Values Should Be*

PROPERTIES	SUS Viscosity @ 210°F	90.1	86-105	95.8	99.3	92.4	91.7	91.4
	cSt Viscosity @ 100°C	18.00	17.0-21.8	19.37	20.19	18.55	18.39	18.32
	Flashpoint in °F	450	>430	480	465	450	450	445
	Fuel %	<0.5	<1.0	<0.5	<0.5	<0.5	<0.5	<0.5
	Antifreeze %	-		-	-	-	-	-
	Water %	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Insolubles %	0.5	<0.6	0.4	0.4	0.4	0.3	0.4
	TBN							
	TAN							
	ISO Code							

* THIS COLUMN APPLIES ONLY TO THE CURRENT SAMPLE

416 E. PETTIT AVE. FORT WAYNE, IN 46806 (260) 744-2380 www.blackstone-labs.com



OIL REPORT

LAB NUMBER: L73279
 REPORT DATE: 11/5/2019
 CODE: 1/16

UNIT ID: N181MC
 CLIENT ID: 169115
 PAYMENT: Bulk CC

UNIT	MAKE/MODEL: Continental IO-550-N68	OIL TYPE & GRADE: Phillips XC (A/C) 20W/50
	FUEL TYPE: Gasoline (Leaded)	OIL USE INTERVAL: 18 Hours
	ADDITIONAL INFO: Cirrus SR22, S/N: 1036520, 4720	

CLIENT	RICK MCCOMB / JIM ODENWALDT/ DANIEL ST	PHONE: (703) 443-4739
	FLY ADVANCED WINCHESTER	FAX:
	509 AIRPORT RD	ALT PHONE: (508) 633-2495
	SUITE 109	EMAIL: rmccomb@flyadvanced.com,
	WINCHESTER, VA 22602	jodenwaldt@flyadvanced.com,

COMMENTS STEVE/MIKE: The only thing we have to report for this engine is improvement - which is what we'd expect on a shorter-than-usual oil change. All metals are appropriately balanced. Silicon improved to 4 ppm, showing no issues with air filtration (or excessive sealers). Insolubles look good too, and no fuel or water is present. All signs point to good engine as of the 10/16/19 sample date.

ELEMENTS IN PARTS PER MILLION	MI/HR on Oil	18	UNIT / LOCATION AVERAGES	80					38	UNIVERSAL AVERAGES
	MI/HR on Unit	316		298	218	207	155	107		
	Sample Date	10/16/2019		9/26/2019	7/2/2019	6/5/2019	5/2/2019	3/6/2019		
	Make Up Oil Added									
	ALUMINUM	5	10	13	4	8	10	10	10	7
	CHROMIUM	10	12	23	9	17	23	23	23	11
	IRON	33	48	90	26	49	63	66	66	50
	COPPER	4	5	9	3	9	11	14	14	5
	LEAD	4911	6095	9175	3197	7335	7794	6966	6966	5703
	TIN	2	1	3	0	1	3	4	4	2
	MOLYBDENUM	5	6	15	4	8	11	13	13	5
	NICKEL	10	12	18	7	9	8	9	9	11
	MANGANESE	1	1	1	0	1	1	1	1	1
	SILVER	0	0	0	0	0	0	0	0	0
	TITANIUM	0	0	1	0	0	0	0	0	0
	POTASSIUM	0	0	0	0	0	1	1	1	0
	BORON	0	1	0	1	0	0	0	0	1
	SILICON	4	8	7	6	15	11	12	12	6
	SODIUM	1	2	1	1	1	1	2	2	2
	CALCIUM	1	2	2	1	2	8	9	9	26
	MAGNESIUM	0	0	1	1	0	1	2	2	1
	PHOSPHORUS	2	196	3	12	66	3	3	3	193
	ZINC	2	3	4	2	3	6	9	9	4
	BARIUM	0	0	0	0	0	0	0	0	0

Values Should Be*

PROPERTIES	95.8	86-105	99.3	92.4	91.7	91.4	91.1
SUS Viscosity @ 210°F	95.8	86-105	99.3	92.4	91.7	91.4	91.1
cSt Viscosity @ 100°C	19.37	17.0-21.8	20.19	18.55	18.39	18.32	18.24
Flashpoint in °F	480	>430	465	450	450	445	445
Fuel %	<0.5	<1.0	<0.5	<0.5	<0.5	<0.5	<0.5
Antifreeze %	-	-	-	-	-	-	-
Water %	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Insolubles %	0.4	<0.6	0.4	0.4	0.3	0.4	0.4
TBN							
TAN							
ISO Code							

* THIS COLUMN APPLIES ONLY TO THE CURRENT SAMPLE

416 E. PETTIT AVE. FORT WAYNE, IN 46806 (260) 744-2380 www.blackstone-labs.com



OIL REPORT

LAB NUMBER: L62334
 REPORT DATE: 10/3/2019
 CODE: 1/16

UNIT ID: N181MC
 CLIENT ID: 169115
 PAYMENT: Bulk CC

UNIT	MAKE/MODEL: Continental IO-550-N68	OIL TYPE & GRADE: Phillips XC (A/C) 20W/50
	FUEL TYPE: Gasoline (Leaded)	OIL USE INTERVAL: 80 Hours
	ADDITIONAL INFO: Cirrus SR22, S/N: 1036520, 4720	

CLIENT	RICK MCCOMB / JIM ODENWALDT/ DANIEL ST	PHONE: (703) 443-4739
	FLY ADVANCED WINCHESTER	FAX:
	509 AIRPORT RD	ALT PHONE: (508) 633-2495
	SUITE 109	EMAIL: rmccomb@flyadvanced.com,
	WINCHESTER, VA 22602	jodenwaldt@flyadvanced.com,

COMMENTS STEVE/MIKE: This oil has 80 hours on it, and for the interval most wear levels actually look pretty good. As a reminder, averages are only based on a 40-hour run. Chrome does show a bit more ring wear than the interval alone accounts for, but it's by no means a cautionary result. This IO-550 averages about 20 ppm of chrome. If oil consumption is stable and the engine runs with normal temps, we wouldn't worry much. No contamination showed up. At 7 ppm, silicon is low enough to show the air filter worked just fine. Nice results, especially for the hours on the oil.

ELEMENTS IN PARTS PER MILLION	MI/HR on Oil	80	UNIT / LOCATION AVERAGES						UNIVERSAL AVERAGES
	MI/HR on Unit	298		218	207	155	107	69	
	Sample Date	9/26/2019	7/2/2019	6/5/2019	5/2/2019	3/6/2019	1/8/2019		
	Make Up Oil Added								
ALUMINUM	13	10	4	8	10	10	10	7	
CHROMIUM	23	12	9	17	23	23	24	11	
IRON	90	48	26	49	63	66	64	50	
COPPER	9	5	3	9	11	14	25	5	
LEAD	9175	6095	3197	7335	7794	6966	6382	5703	
TIN	3	1	0	1	3	4	3	2	
MOLYBDENUM	15	6	4	8	11	13	13	5	
NICKEL	18	12	7	9	8	9	5	11	
MANGANESE	1	1	0	1	1	1	1	1	
SILVER	0	0	0	0	0	0	0	0	
TITANIUM	1	0	0	0	0	0	0	0	
POTASSIUM	0	0	0	0	1	1	1	0	
BORON	0	1	1	0	0	0	1	1	
SILICON	7	8	6	15	11	12	13	6	
SODIUM	1	2	1	1	1	2	1	2	
CALCIUM	2	2	1	2	8	9	17	26	
MAGNESIUM	1	0	1	0	1	2	2	1	
PHOSPHORUS	3	196	12	66	3	3	8	193	
ZINC	4	3	2	3	6	9	19	4	
BARIUM	0	0	0	0	0	0	0	0	

Values Should Be*

PROPERTIES	SUS Viscosity @ 210°F	99.3	86-105	92.4	91.7	91.4	91.1	90.9
	cSt Viscosity @ 100°C	20.19	17.0-21.8	18.55	18.39	18.32	18.24	18.19
	Flashpoint in °F	465	>430	450	450	445	445	470
	Fuel %	<0.5	<1.0	<0.5	<0.5	<0.5	<0.5	<0.5
	Antifreeze %	-		-	-	-	-	-
	Water %	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Insolubles %	0.4	<0.6	0.4	0.3	0.4	0.4	0.3
	TBN							
	TAN							
	ISO Code							

* THIS COLUMN APPLIES ONLY TO THE CURRENT SAMPLE

416 E. PETTIT AVE. FORT WAYNE, IN 46806 (260) 744-2380 www.blackstone-labs.com



OIL REPORT

LAB NUMBER: L38227
 REPORT DATE: 7/17/2019
 CODE: 1/16

UNIT ID: N181MC
 CLIENT ID: 169115
 PAYMENT: Bulk CC

UNIT	MAKE/MODEL: Continental IO-550-N68	OIL TYPE & GRADE: 20W/50
	FUEL TYPE: Gasoline (Leaded)	OIL USE INTERVAL: Hours
	ADDITIONAL INFO: Cirrus SR22, S/N: 1036520, 4720	

CLIENT	RICK MCCOMB / JIM ODENWALDT/ DANIEL ST	PHONE: (703) 443-4739
	FLY ADVANCED WINCHESTER	FAX:
	509 AIRPORT RD	ALT PHONE: (508) 633-2495
	SUITE 109	EMAIL: rmccomb@flyadvanced.com,
	WINCHESTER, VA 22602	jodenwaldt@flyadvanced.com,

COMMENTS STEVE/MIKE: Looks like this may have been one of the shorter oil runs for N181MC in recent history, based on the total engine hours and the low level of leaded blow-by, and that probably helped bring about some of the lowest wear levels on the page, too. Really the only metal that could've stood to be lower in the last few reports was chrome, so it's nice to be able to leave it unmarked this time. Silicon is also at a low, showing appropriate air filtration during this run. No fuel or water was present, and insolubles were fine at 0.4%. Nice report, all told.

	UNIT / LOCATION AVERAGES		VALUES					UNIVERSAL AVERAGES
	MI/HR on Oil	MI/HR on Unit	6/5/2019	5/2/2019	3/6/2019	1/8/2019	12/12/2018	
Sample Date	7/2/2019							
Make Up Oil Added								
ALUMINUM	4	10	8	10	10	10	19	7
CHROMIUM	9	12	17	23	23	24	43	11
IRON	26	48	49	63	66	64	73	50
COPPER	3	5	9	11	14	25	59	5
LEAD	3197	6095	7335	7794	6966	6382	4519	5703
TIN	0	1	1	3	4	3	4	2
MOLYBDENUM	4	6	8	11	13	13	14	5
NICKEL	7	12	9	8	9	5	8	11
MANGANESE	0	1	1	1	1	1	4	1
SILVER	0	0	0	0	0	0	0	0
TITANIUM	0	0	0	0	0	0	0	0
POTASSIUM	0	0	0	1	1	1	5	0
BORON	1	1	0	0	0	1	2	1
SILICON	6	8	15	11	12	13	19	6
SODIUM	1	2	1	1	2	1	4	2
CALCIUM	1	2	2	8	9	17	100	26
MAGNESIUM	1	0	0	1	2	2	5	1
PHOSPHORUS	12	196	66	3	3	8	54	193
ZINC	2	3	3	6	9	19	97	4
BARIUM	0	0	0	0	0	0	0	0

Values Should Be*

PROPERTIES	VALUES	VALUES	VALUES	VALUES	VALUES	VALUES	VALUES
SUS Viscosity @ 210°F	92.4	81-105	91.7	91.4	91.1	90.9	76.0
cSt Viscosity @ 100°C	18.55	15.8-21.8	18.39	18.32	18.24	18.19	14.50
Flashpoint in °F	450	>445	450	445	445	470	445
Fuel %	<0.5	<1.0	<0.5	<0.5	<0.5	<0.5	0.8
Antifreeze %	-		-	-	-	-	-
Water %	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Insolubles %	0.4	<0.6	0.3	0.4	0.4	0.3	0.2
TBN							
TAN							
ISO Code							

* THIS COLUMN APPLIES ONLY TO THE CURRENT SAMPLE

416 E. PETTIT AVE. FORT WAYNE, IN 46806 (260) 744-2380 www.blackstone-labs.com



OIL REPORT

LAB NUMBER: L29522 UNIT ID: N181MC
 REPORT DATE: 6/18/2019 CLIENT ID: 169115
 CODE: 1/16 PAYMENT: CC: AmEx (Bulk)

UNIT	MAKE/MODEL: Continental IO-550-N68	OIL TYPE & GRADE: Aircraft Engine Oil
	FUEL TYPE: Gasoline (Leaded)	OIL USE INTERVAL: Hours
	ADDITIONAL INFO: Cirrus SR22, S/N: 1036520, 4720	

CLIENT	RICK MCCOMB / JIM ODENWALDT/ DANIEL ST	PHONE: (703) 443-4739
	FLY ADVANCED WINCHESTER	FAX:
	509 AIRPORT RD	ALT PHONE: (508) 633-2495
	SUITE 109	EMAIL: rmccomb@flyadvanced.com,
	WINCHESTER, VA 22602	jodenwaldt@flyadvanced.com,

COMMENTS STEVE/MIKE: We're really tempted not to mark chrome in this sample. Technically, it's more than twice average so it is marked, but it's been such a common finding in this engine's samples that it really doesn't look out of place. We'll give it another look or two just for good measure, but we'll probably stop marking it before too long, even if it doesn't improve much more than this. Silicon nudged up, so do make sure the air filter/intake is clean and in good working order. Also: if the cylinders are chrome or Millennium, let us know -- that'd be reason to immediately unmark chrome.

ELEMENTS IN PARTS PER MILLION	MI/HR on Oil				38		23	
	MI/HR on Unit	207	UNIT / LOCATION AVERAGES	155	107	69	23	UNIVERSAL AVERAGES
	Sample Date	6/5/2019		5/2/2019	3/6/2019	1/8/2019	12/12/2018	
	Make Up Oil Added							
ALUMINUM	8	10	10	10	10	10	19	7
CHROMIUM	17	12	23	23	24	24	43	11
IRON	49	48	63	66	64	64	73	50
COPPER	9	5	11	14	25	25	59	5
LEAD	7335	6095	7794	6966	6382	6382	4519	5703
TIN	1	1	3	4	3	3	4	2
MOLYBDENUM	8	6	11	13	13	13	14	5
NICKEL	9	12	8	9	5	5	8	11
MANGANESE	1	1	1	1	1	1	4	1
SILVER	0	0	0	0	0	0	0	0
TITANIUM	0	0	0	0	0	0	0	0
POTASSIUM	0	0	1	1	1	1	5	0
BORON	0	1	0	0	1	1	2	1
SILICON	15	8	11	12	13	13	19	6
SODIUM	1	2	1	2	1	1	4	2
CALCIUM	2	2	8	9	17	17	100	26
MAGNESIUM	0	0	1	2	2	2	5	1
PHOSPHORUS	66	196	3	3	8	8	54	193
ZINC	3	3	6	9	19	19	97	4
BARIUM	0	0	0	0	0	0	0	0

Values Should Be*

PROPERTIES	SUS Viscosity @ 210°F	91.7		91.4	91.1	90.9	76.0	
	cSt Viscosity @ 100°C	18.39		18.32	18.24	18.19	14.50	
	Flashpoint in °F	450	>430	445	445	470	445	
	Fuel %	<0.5	<1.0	<0.5	<0.5	<0.5	0.8	
	Antifreeze %	-		-	-	-	-	
	Water %	0.0	0.0	0.0	0.0	0.0	0.0	
	Insolubles %	0.3	<0.6	0.4	0.4	0.3	0.2	
	TBN							
	TAN							
	ISO Code							

* THIS COLUMN APPLIES ONLY TO THE CURRENT SAMPLE

416 E. PETTIT AVE. FORT WAYNE, IN 46806 (260) 744-2380 www.blackstone-labs.com



OIL REPORT

LAB NUMBER: L21148 UNIT ID: N181MC
 REPORT DATE: 5/22/2019 CLIENT ID: 169115
 CODE: 1/16 PAYMENT: CC: AmEx (Bulk)

UNIT	MAKE/MODEL: Continental IO-550-N68	OIL TYPE & GRADE: Phillips XC (A/C) 20W/50
	FUEL TYPE: Gasoline (Leaded)	OIL USE INTERVAL: Hours
	ADDITIONAL INFO: Cirrus SR22, S/N: 1036520, 4720	

CLIENT	RICK MCCOMB / JIM ODENWALDT/ DANIEL ST	PHONE: (703) 443-4739
	FLY ADVANCED WINCHESTER	FAX:
	509 AIRPORT RD	ALT PHONE: (508) 633-2495
	SUITE 109	EMAIL: rmccomb@flyadvanced.com,
	WINCHESTER, VA 22602	jodenwaldt@flyadvanced.com,

COMMENTS STEVE/MIKE: Copper dropped into the average range during this run, but chrome didn't seem to get that memo. It's still at 23 ppm, showing more ring wear than the average IO-550-N. This is a brand new engine too, so there shouldn't be any aftermarket cylinders in use that might explain the extra chrome. It could indicate a ring problem in this young engine, or maybe poor wear from cylinder glazing. Make sure oil consumption is stable and consider checking compressions if that hasn't been done recently. Nice report aside from the extra chrome. Hopefully it improves soon.

ELEMENTS IN PARTS PER MILLION	MI/HR on Oil			38		23		UNIVERSAL AVERAGES
	MI/HR on Unit	155	UNIT / LOCATION AVERAGES	107	69	23		
	Sample Date	5/2/2019		3/6/2019	1/8/2019	12/12/2018		
	Make Up Oil Added							
ALUMINUM	10	10	10	10	19		7	
CHROMIUM	23	12	23	24	43		11	
IRON	63	48	66	64	73		50	
COPPER	11	5	14	25	59		5	
LEAD	7794	6095	6966	6382	4519		5703	
TIN	3	1	4	3	4		2	
MOLYBDENUM	11	6	13	13	14		5	
NICKEL	8	12	9	5	8		11	
MANGANESE	1	1	1	1	4		1	
SILVER	0	0	0	0	0		0	
TITANIUM	0	0	0	0	0		0	
POTASSIUM	1	0	1	1	5		0	
BORON	0	1	0	1	2		1	
SILICON	11	8	12	13	19		6	
SODIUM	1	2	2	1	4		2	
CALCIUM	8	2	9	17	100		26	
MAGNESIUM	1	0	2	2	5		1	
PHOSPHORUS	3	196	3	8	54		193	
ZINC	6	3	9	19	97		4	
BARIUM	0	0	0	0	0		0	

Values Should Be*

PROPERTIES	SUS Viscosity @ 210°F	91.4	86-105	91.1	90.9	76.0	
	cSt Viscosity @ 100°C	18.32	17.0-21.8	18.24	18.19	14.50	
	Flashpoint in °F	445	>430	445	470	445	
	Fuel %	<0.5	<1.0	<0.5	<0.5	0.8	
	Antifreeze %	-		-	-	-	
	Water %	0.0	0.0	0.0	0.0	0.0	
	Insolubles %	0.4	<0.6	0.4	0.3	0.2	
	TBN						
	TAN						
	ISO Code						

* THIS COLUMN APPLIES ONLY TO THE CURRENT SAMPLE

416 E. PETTIT AVE. FORT WAYNE, IN 46806 (260) 744-2380 www.blackstone-labs.com



OIL REPORT

LAB NUMBER: L08640 UNIT ID: N181MC
 REPORT DATE: 4/11/2019 CLIENT ID: 169115
 CODE: 1/16 PAYMENT: CC: AmEx (Bulk)

UNIT	MAKE/MODEL: Continental IO-550-N68	OIL TYPE & GRADE: Phillips XC (A/C) 20W/50
	FUEL TYPE: Gasoline (Leaded)	OIL USE INTERVAL: 38 Hours
	ADDITIONAL INFO: Cirrus SR22, S/N: 1036520, 4720	

CLIENT	RICK MCCOMB / JIM ODENWALDT/ DANIEL ST	PHONE: (703) 443-4739
	FLY ADVANCED WINCHESTER	FAX:
	509 AIRPORT RD	ALT PHONE: (508) 633-2495
	SUITE 109	EMAIL: rmccomb@flyadvanced.com,
	WINCHESTER, VA 22602	jodenwaldt@flyadvanced.com,

COMMENTS STEVE/MIKE: It would have been nice to see metals a little lower since wear-in is supposed to be washing out. Copper at least got the message since it dropped a bit from last time. All that said, chrome is really the only metal that we're concerned about. It shows quite a bit of ring wear still. Make sure oil consumption is stable or improving. If any chrome or Millennium cylinders are in use, extra chrome might prove normal. Hopefully it drops a bit next time. If it doesn't a compression check might be warranted, but we're not there yet.

ELEMENTS IN PARTS PER MILLION			UNIT / LOCATION AVERAGES				UNIVERSAL AVERAGES
	MI/HR on Oil		1/8/2019	12/12/2018			
MI/HR on Oil	38			23			
MI/HR on Unit	107		69	23			
Sample Date	3/6/2019						
Make Up Oil Added							
ALUMINUM	10	10	10	19			7
CHROMIUM	23	12	24	43			11
IRON	66	48	64	73			50
COPPER	14	5	25	59			5
LEAD	6966	6095	6382	4519			5703
TIN	4	1	3	4			2
MOLYBDENUM	13	6	13	14			5
NICKEL	9	12	5	8			11
MANGANESE	1	1	1	4			1
SILVER	0	0	0	0			0
TITANIUM	0	0	0	0			0
POTASSIUM	1	0	1	5			0
BORON	0	1	1	2			1
SILICON	12	8	13	19			6
SODIUM	2	2	1	4			2
CALCIUM	9	2	17	100			26
MAGNESIUM	2	0	2	5			1
PHOSPHORUS	3	196	8	54			193
ZINC	9	3	19	97			4
BARIUM	0	0	0	0			0

Values Should Be*

PROPERTIES		86-105	90.9	76.0			
SUS Viscosity @ 210°F	91.1	86-105	90.9	76.0			
cSt Viscosity @ 100°C	18.24	17.0-21.8	18.19	14.50			
Flashpoint in °F	445	>430	470	445			
Fuel %	<0.5	<1.0	<0.5	0.8			
Antifreeze %	-		-	-			
Water %	0.0	0.0	0.0	0.0			
Insolubles %	0.4	<0.6	0.3	0.2			
TBN							
TAN							
ISO Code							

* THIS COLUMN APPLIES ONLY TO THE CURRENT SAMPLE

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OIL REPORT

LAB NUMBER: K88670 UNIT ID: N181MC
 REPORT DATE: 1/25/2019 CLIENT ID: 169115
 CODE: 1/16 PAYMENT: CC: AmEx (Bulk)

UNIT	MAKE/MODEL: Continental IO-550-N68	OIL TYPE & GRADE: Phillips XC (A/C) 20W/50
	FUEL TYPE: Gasoline (Leaded)	OIL USE INTERVAL: Hours
	ADDITIONAL INFO: Cirrus SR22, S/N: 1036520, 4720	

CLIENT	RICK MCCOMB / JIM ODENWALDT/ DANIEL ST	PHONE: (703) 443-4739
	FLY ADVANCED WINCHESTER	FAX:
	509 AIRPORT RD	ALT PHONE: (508) 633-2495
	SUITE 109	EMAIL: rmccomb@flyadvanced.com,
	WINCHESTER, VA 22602	jodenwaldt@flyadvanced.com,

COMMENTS STEVE/MIKE: Metals and silicon are still on the high side, but that doesn't change the fact that there's a lot of progress to take in with this second sample. Judging by the engine hours, we'd guess this was a longer interval than last time, so the reduction in metal shows the residual wear-in material is well on its way to washing out. Silicon is also getting there, as it just needs to drop another ppm or two before we can call it okay. Fuel dilution cleared right up, likely due to the rings now being seated. Looks good, so far! Just check back to see how trends progress.

ELEMENTS IN PARTS PER MILLION	MI/HR on Oil		UNIT / LOCATION AVERAGES	23					
	MI/HR on Unit	69		23					UNIVERSAL AVERAGES
	Sample Date	1/8/2019		12/12/2018					
	Make Up Oil Added								
ALUMINUM	10	10	19						7
CHROMIUM	24	12	43						11
IRON	64	48	73						50
COPPER	25	5	59						5
LEAD	6382	6095	4519						5703
TIN	3	1	4						2
MOLYBDENUM	13	6	14						5
NICKEL	5	12	8						11
MANGANESE	1	1	4						1
SILVER	0	0	0						0
TITANIUM	0	0	0						0
POTASSIUM	1	0	5						0
BORON	1	1	2						1
SILICON	13	8	19						6
SODIUM	1	2	4						2
CALCIUM	17	2	100						26
MAGNESIUM	2	0	5						1
PHOSPHORUS	8	196	54						193
ZINC	19	3	97						4
BARIUM	0	0	0						0

Values Should Be*

PROPERTIES	SUS Viscosity @ 210°F	90.9	86-105	76.0				
	cSt Viscosity @ 100°C	18.19	17.0-21.8	14.50				
	Flashpoint in °F	470	>430	445				
	Fuel %	<0.5	<1.0	0.8				
	Antifreeze %	-		-				
	Water %	0.0	0.0	0.0				
	Insolubles %	0.3	<0.6	0.2				
	TBN							
	TAN							
	ISO Code							

* THIS COLUMN APPLIES ONLY TO THE CURRENT SAMPLE

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OIL REPORT

LAB NUMBER: K83960
 REPORT DATE: 1/9/2019
 CODE: 1/16

UNIT ID: N181MC
 CLIENT ID: 169115
 PAYMENT: CC: AmEx (Bulk)

UNIT	MAKE/MODEL: Continental IO-550-N68	OIL TYPE & GRADE: Mineral Oil
	FUEL TYPE: Gasoline (Leaded)	OIL USE INTERVAL: 23 Hours
	ADDITIONAL INFO: Cirrus SR22, S/N: 1036520, 4720	

CLIENT	RICK MCCOMB / JIM ODENWALDT/ DANIEL ST	PHONE: (703) 443-4739
	FLY ADVANCED WINCHESTER	FAX:
	509 AIRPORT RD	ALT PHONE: (508) 633-2495
	SUITE 109	EMAIL: rmccomb@flyadvanced.com,
	WINCHESTER, VA 22602	jodenwaldt@flyadvanced.com,

COMMENTS STEVE/MIKE: This is a new engine, so high metals and silicon aren't a surprise. Initial break-in is a big factor in the extra metal, while most of the silicon is from sealers. We'll watch chrome (from rings) since it's a bit higher than is typical at this point, but assuming operation is normal and oil consumption has at least started to stabilize, then it should improve with other metals over the next few oil changes. Universal averages show typical wear after ~40 hours of oil use. Fuel isn't a concern at 0.8%, as it's likely from before the rings were seated, and may clear up on its own.

ELEMENTS IN PARTS PER MILLION			UNIT / LOCATION AVERAGES					UNIVERSAL AVERAGES
	MI/HR on Oil							
	MI/HR on Oil	23						
	MI/HR on Unit	23						
	Sample Date	12/12/2018						
	Make Up Oil Added							
	ALUMINUM	19	10					7
	CHROMIUM	43	12					11
	IRON	73	48					50
	COPPER	59	5					5
	LEAD	4519	6095					5703
	TIN	4	1					2
	MOLYBDENUM	14	6					5
	NICKEL	8	12					11
	MANGANESE	4	1					1
	SILVER	0	0					0
	TITANIUM	0	0					0
	POTASSIUM	5	0					0
	BORON	2	1					1
	SILICON	19	8					6
	SODIUM	4	2					2
	CALCIUM	100	2					26
	MAGNESIUM	5	0					1
	PHOSPHORUS	54	196					193
	ZINC	97	3					4
	BARIUM	0	0					0

Values Should Be*

PROPERTIES	SUS Viscosity @ 210°F	76.0					
	cSt Viscosity @ 100°C	14.50					
	Flashpoint in °F	445	>460				
	Fuel %	0.8	<1.0				
	Antifreeze %	-					
	Water %	0.0	0.0				
	Insolubles %	0.2	<0.6				
	TBN						
	TAN						
	ISO Code						

* THIS COLUMN APPLIES ONLY TO THE CURRENT SAMPLE

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