

# MARINE ENGINE SURVEYORS & CONSULTANTS

## MARINE ENGINE SURVEY

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SURVEY DATE: MAY 1, 2024

CLIENT: JOSE FERNANDEZ

M/Y: WOMBAT

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PERFORMED GENERAL SURVEY ON VESSEL, MAIN PROPULSION ENGINES, GEARS AND  
AUXILIARY GENERATOR

### MAIN ENGINES:

PORT ENGINE MODEL NUMBER : QSB 6.7

ENGINE HOURS: 358

SERIAL NUMBER: 73567977

PORT TRANSMISSION MODEL NUMBER : ZF 2800

SERIAL NUMBER: 20174834

STARBOARD ENGINE MODEL NUMBER : QSB 6.7

ENGINE HOURS: 356

SERIAL NUMBER: 73567960

STARBOARD TRANSMISSION MODEL NUMBER : ZF 2800

SERIAL NUMBER: 20174832

MAIN GENERATOR MODEL NUMBER: K3-8.0KW

SERIAL NUMBER: 07753

GENERATOR HOURS: 427

**SEA TRIAL READINGS:**

	<u>PORT ENGINE</u>	<u>STARBOARD ENGINE</u>
OIL TEMPERATURE	147	146
OIL PRESSURE	55.1	54.8
WATER TEMPERATURE	172	173
VOLTS	14.1	14.2
IDLE RPM	602	601
FULL LOAD RPM	3340	3340
EXHAUST BOOST PRESSURE	18.9	20.0
TRANSMISSION PRESSURE	50	58
GEAR TEMPERATURE	126	122
ENGINE LOAD	96	99

\*NOTE: ITEMS WITH ASTERISK REPRESENT A DEFICIENCY

**MAIN GENERATOR READINGS:**

OIL PRESSURE	69
WATER TEMPERATURE	176
DC VOLTAGE	13.6
AC VOLTAGE	121/242
HERTZ	61.2

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**MAIN ENGINE DEFICIENCIES:**

**PORT ENGINE:**

NO DEFICIENCIES FOUND

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**STARBOARD ENGINE:**

NO DEFICIENCIES FOUND

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**MAIN GENERATOR:**

NO DEFICIENCIES FOUND

**RECOMMENDATIONS:**

NONE

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**NOTE:**

ALL QUOTES ARE ESTIMATED AND DO **NOT** INCLUDE STATE SALES TAX OR ANY UNFORSEEN DAMAGE OR COMPONENTS THAT HAVE BEEN DAMAGED, OR FEES FOR THE FOLLOWING: DOCKAGE, HAUL OUT, BLOCK OR LAUNCH OF VESSEL, STORAGE FEES, YARD AND/OR FORKLIFT FEES, EXPEDITED FREIGHT OR TRAVEL TIME TO AND FROM VESSEL. QUOTES, TERMS AND PRICING ARE VALID FOR 30 DAYS. PRICES ARE SUBJECT TO CHANGE WITHOUT NOTICE. A DEPOSIT IS REQUIRED PRIOR TO THE COMMENCEMENT OF WORK. THE REMAINING BALANCE IS DUE AND PAYABLE IN FULL UPON COMPLETION OF WORK. WE DO NOT GUARANTEE THE TIMEFRAME OF ANY JOB DUE TO THE POSSIBILITY OF BACKORDERD PARTS, MATERIALS OR ISSUES THAT MAY ARISE THAT ARE BEYOND OUR CONTROL.

THE COMMENTS AS STATED IN THIS REPORT ARE BASED ON ENGINE INSPECTIONS THAT WERE PERFORMED TO THE BEST OF OUR ABILITY AND WITH AS MUCH ATTENTION TO DETAIL AS POSSIBLE. THE RESULTS ARE BELIEVED TO BE AN ACCURATE EVALUATION AS TO THE GENERAL CONDITION OF THE ENGINES AT THIS TIME.

HOWEVER, *MARINE ENGINE SURVEYORS & CONSULTANTS* OFFERS NO WARRANTY EITHER EXPRESSED OR IMPLIED ON THE ENGINES OF **M/Y WOMBAT** . SURVEY RESULTS ARE INTENDED TO REPRESENT THE PHYSICAL CONDITION OF THE VESSEL ONLY ON THE DAY OF THE SURVEY, BASED ON THE FACTS PRESENTED AND DISCOVERED, IN THE OPINION OF THE SURVEYOR. THIS REPORT WILL NOT SPECIFY OR IMPLY ANY TYPE OF WARRANTY OF THE VESSEL OR THE VESSEL'S MACHINERY.


THIS REPORT IS ISSUED SUBJECT TO THE CONDITION THAT IT IS UNDERSTOOD AND AGREED THAT NEITHER THIS OFFICE, NOR ANY SURVEYOR OR EMPLOYEE THEREOF, IS UNDER ANY CIRCUMSTANCES WHATSOEVER TO BE HELD RESPONSIBLE IN ANY WAY FOR ANY ERROR IN JUDGEMENT, DEFAULT OR NEGLIGENCE, NOR FOR ANY INACCURACY, OMISSION, MISREPRESENTATION OR MISSTATEMENT IN THIS REPORT, AND THAT THE USE OF THIS REPORT SHALL BE CONSTRUED TO BE AN ACCEPTANCE OF THE FOREGOING CONDITIONS.

THE LABOR AND MATERIAL ESTIMATES FOR THE DEFICIENCIES FOUND ARE **ONLY** IF THE VESSEL IS PRESENT AT OUR FACILITY IN MILFORD CONNECTICUT FOR THE REPAIRS, AND DO NOT INCLUDE STATE SALES TAX. YOUR RECEIPT OF THIS DOCUMENT IS YOUR ACCEPTANCE THAT YOU AGREE TO IT'S CONTENTS. THIS REPORT IS ISSUED WITHOUT PREJUDICE TO THE RIGHTS OF WHOM IT MAY CONCERN.

THANK YOU FOR THE OPPORTUNITY TO BE OF SERVICE AND IF YOU HAVE ANY QUESTIONS, PLEASE DON'T HESITATE TO CALL.

SINCERELY,  
PAUL WALKER, JR.  
PRESIDENT, MARINE ENGINE SURVEYORS & CONSULTANTS



<b>CONNECTICUT DIESEL &amp; MARINE</b>		Machine ID: WOMBAT 5-1-2024		Component ID: 735679601		 <b>MOTORCHECK LAB</b> 2000 N FLORIDA MANGO RD 104 WEST PALM BEACH FL 33409 561-684-7799
Phone: Email: Fax:		Machine Year : NA		Component Make: CUMMINS Component Model: QSB 6.7 Component Year: NA Component Type : DIESEL ENGINE Component Location: STARBOARD MAIN		
Component Description:		Sump Capacity: 6 Gallons				

Sample ID	Date Taken	Hours on Component	Hours on Oil	Oil Weight	Oil Brand	Oil Type	Oil Changed	Date Analyzed	User Sample ID
26297	5/1/2024	556	100	15W40	UNKNOWN	UNKNOWN	No	5/1/2024	
Comments ALL ENGINE WEAR RATES NORMAL. SAMPLE APPEARS FREE OF EXTERNAL CONTAMINATION. ANALYSIS INDICATES PROPER PERFORMANCE OF THE LUBRICANT AND UNIT.									

Wear Metals(ppm)							Contaminant Metals (ppm)			Multi-Source Metals (ppm)					Additives (ppm)					
Sample ID	Iron	Chromium	Aluminum	Copper	Lead	Tin	Vanadium	Silicon	Sodium	Potassium	Titanium	Molybdenum	Nickel	Manganese	Boron	Magnesium	Calcium	Barium	Phosphorus	Zinc
26297	40	<2	18	6	<2	<2	X	4	21	29	X	42	X	X	X	X	X	X	X	X

Contaminants					Physical Properties								
Sample ID	Fuel	Soot	Water	Glycol	Nitration	TBN	Oxidation	V40C	V100C	Vindex	V40C Limit	V100C Limit	Visc Mode
26297	-	0.2	<0.1	-	2.6	10.2	5.6	110	14.5	135	92 - 124	12.5 - 16.3	C

ABNORMAL

SEVERE

D = DETECTED


- = NOT DETECTED

X = NOT TESTED / NOT APPLICABLE

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M = MEASURED

<b>CONNECTICUT DIESEL &amp; MARINE</b>		Machine ID: WOMBAT 5-1-2024		Component ID: 735679771			
Phone: _____		Machine Year : NA		Component Make: CUMMINS		MOTORCHECK LAB	
Email: _____				Component Model: QSB 6.7		2000 N FLORIDA MANGO RD 104	
Fax: _____				Component Year: NA		WEST PALM BEACH FL 33409	
		Component Description:		Component Type : DIESEL ENGINE		561-684-7799	
				Component Location: PORT MAIN			
		Sump Capacity: 6 Gallons					

Sample ID	Date Taken	Hours on Component	Hours on Oil	Oil Weight	Oil Brand	Oil Type	Oil Changed	Date Analyzed	User Sample ID
26296	5/1/2024	558	100	15W40	UNKNOWN	UNKNOWN	No	5/1/2024	
Comments ALL ENGINE WEAR RATES NORMAL. SAMPLE APPEARS FREE OF EXTERNAL CONTAMINATION. ANALYSIS INDICATES PROPER PERFORMANCE OF THE LUBRICANT AND UNIT.									

Wear Metals(ppm)						Contaminant Metals (ppm)			Multi-Source Metals (ppm)					Additives (ppm)						
Sample ID	Iron	Chromium	Aluminum	Copper	Lead	Tin	Vanadium	Silicon	Sodium	Potassium	Titanium	Molybdenum	Nickel	Manganese	Boron	Magnesium	Calcium	Barium	Phosphorus	Zinc
26296	57	5	<2	9	<2	<2	X	3	20	12	X	34	X	X	X	X	X	X	X	X

Contaminants					Physical Properties								
Sample ID	Fuel	Soot	Water	Glycol	Nitration	TBN	Oxidation	V40C	V100C	Vindex	V40C Limit	V100C Limit	Visc Mode
26296	-	0.1	<0.1	-	2.6	10.1	5.2	110	14.5	135	92 - 124	12.5 - 16.3	C

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<b>CONNECTICUT DIESEL &amp; MARINE</b>		Machine ID: WOMBAT		Component ID: 07753			
Phone: _____ Email: _____ Fax: _____		Machine Year : NA		Component Make: PHASOR Component Model: K3-8.0KW Component Year: NA Component Type : DIESEL ENGINE Component Location: GENSET		MOTORCHECK LAB 2000 N FLORIDA MANGO RD 104 WEST PALM BEACH FL 33409 561-684-7799	
Component Description:				Sump Capacity: 5 Quarts			

Sample ID	Date Taken	Hours on Component	Hours on Oil	Oil Weight	Oil Brand	Oil Type	Oil Changed	Date Analyzed	User Sample ID
26219	4/22/2024	427	100	15W40	UNKNOWN	UNKNOWN	No	4/22/2024	
ALL ENGINE WEAR RATES NORMAL. SAMPLE APPEARS FREE OF EXTERNAL CONTAMINATION. ANALYSIS INDICATES PROPER PERFORMANCE OF THE LUBRICANT AND UNIT.									
Comments									

Wear Metals(ppm)							Contaminant Metals (ppm)			Multi-Source Metals (ppm)					Additives (ppm)					
Sample ID	Iron	Chromium	Aluminum	Copper	Lead	Tin	Vanadium	Silicon	Sodium	Potassium	Titanium	Molybdenum	Nickel	Manganese	Boron	Magnesium	Calcium	Barium	Phosphorus	Zinc
26219	<2	2	<2	<2	<2	<2	X	4	9	12	X	32	X	X	X	X	X	X	X	X

Contaminants					Physical Properties								
Sample ID	Fuel	Soot	Water	Glycol	Nitration	TBN	Oxidation	V40C	V100C	Vindex	V40C Limit	V100C Limit	Visc Mode
26219	-	0.2	<0.1	-	3.6	9.9	8.2	111	14.5	133	92 - 124	12.5 - 16.3	C

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<b>CONNECTICUT DIESEL &amp; MARINE</b>		Machine ID: WOMBAT Machine Year: NA		Component ID: 20174834 Component Make: ZF Component Model: 2800 Component Year: NA Component Type: GEARBOX Component Location: PORT Sump Capacity: 3 Gallons		 <b>MOTORCHECK LAB</b> 2000 N FLORIDA MANGO RD 104 WEST PALM BEACH FL 33409 561-684-7799	
Phone: _____ Email: _____ Fax: _____		Component Description:					

Sample ID	Date Taken	Hours on Component	Hours on Oil	Oil Weight	Oil Brand	Oil Type	Oil Changed	Date Analyzed	User Sample ID
26222	4/22/2024	358	100	ATF	UNKNOWN	UNKNOWN	No	4/22/2024	
Comments: GEAR UNIT WEAR RATES NORMAL. SAMPLE APPEARS FREE OF EXTERNAL CONTAMINATION. ANALYSIS INDICATES PROPER PERFORMANCE OF THE LUBRICANT AND UNIT.									

Wear Metals(ppm)							Contaminant Metals (ppm)			Multi-Source Metals (ppm)						Additives (ppm)				
Sample ID	Iron	Chromium	Aluminum	Copper	Lead	Tin	Vanadium	Silicon	Sodium	Potassium	Titanium	Molybdenum	Nickel	Manganese	Boron	Magnesium	Calcium	Barium	Phosphorus	Zinc
26222	12	<2	<2	32	<2	<2	X	4	4	<2	X	<2	X	X	X	X	X	X	X	X

Contaminants					Physical Properties								
Sample ID	Fuel	Soot	Water	Glycol	Nitration	TBN	Oxidation	V40C	V100C	Vindex	V40C Limit	V100C Limit	Visc Mode
26222	X	X	<0.1	X	X	X	<2.0	36	7.4	175	30 - 42	5.8 - 8.9	C

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<b>CONNECTICUT DIESEL &amp; MARINE</b>		Machine ID: WOMBAT		Component ID: 20174832		 <b>MOTORCHECK LAB</b> 2000 N FLORIDA MANGO RD 104 WEST PALM BEACH FL 33409 561-684-1739
Phone: Email: Fax: _____		Machine Year : NA		Component Make: ZF Component Model: 2800 Component Year: NA Component Type : GEARBOX Component Location: STARBOARD		
Component Description:		Sump Capacity: 3 Gallons				

Sample ID	Date Taken	Hours on Component	Hours on Oil	Oil Weight	Oil Brand	Oil Type	Oil Changed	Date Analyzed	User Sample ID
26223	4/22/2024	356	100	ATF	UNKNOWN	UNKNOWN	No	4/22/2024	
GEAR UNIT WEAR RATES NORMAL. SAMPLE APPEARS FREE OF EXTERNAL CONTAMINATION. ANALYSIS INDICATES PROPER PERFORMANCE OF THE LUBRICANT AND UNIT.									

Wear Metals(ppm)							Contaminant Metals (ppm)			Multi-Source Metals (ppm)					Additives (ppm)					
Sample ID	Iron	Chromium	Aluminum	Copper	Lead	Tin	Vanadium	Silicon	Sodium	Potassium	Titanium	Molybdenum	Nickel	Manganese	Boron	Magnesium	Calcium	Barium	Phosphorus	Zinc
26223	29	<2	<2	28	4	2	X	4	<2	<2	X	<2	X	X	X	X	X	X	X	X

Contaminants					Physical Properties								
Sample ID	Fuel	Soot	Water	Glycol	Nitration	TBN	Oxidation	V40C	V100C	Vindex	V40C Limit	V100C Limit	Visc Mode
26223	X	X	<0.1	X	X	X	<2.0	36	7.4	175	30 - 42	5.8 - 8.9	C

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# M<sup>✓</sup>C<sup>™</sup> *UNDERSTANDING YOUR REPORT*

## ENGINES

<b>ALUMINUM:</b>	PISTONS, BEARINGS, HOUSINGS, THRUST WASHERS, BUSHINGS,
<b>CHROMIUM:</b>	COMPRESSION RINGS, LOW FRICTION BEARINGS, LINERS, CHROMATE COOLING SYSTEM
<b>COPPER:</b>	BEARINGS, BUSHINGS, THRUST WASHERS, OIL COOLER, CLUTCHES, AND AN OIL ADDITIVE IN SOME GASOLINE ENGINE OILS.
<b>IRON:</b>	CRANKSHAFT, CYLINDERS, PISTONS, LINERS, BEARINGS, VALVE TRAIN
<b>LEAD:</b>	BEARINGS, CONTAMINATION FROM LEADED GASOLINE
<b>TIN:</b>	PISTON SKIRTS, BEARINGS, AND BUSHINGS.
<b>SILICON:</b>	AIRBORN DIRT, SEAL MATERIAL, GASKETS, USED IN SOME OIL ADDITIVES, SPRAY LUBRICANTS, WHEN FOUND WITH POTASSIUM INDICATES GLYCOL ISSUE
<b>POTASSIUM:</b>	INDICATION OF GLYCOL OR SALTWATER INTRUSION, ADDITIVE IN SOME OILS
<b>SODIUM:</b>	FOUND IN SOME OIL ADDITIVES, GLYCOL, ENVIRONMENTAL CONTAMINANT OR SALT WATER
<b>WATER:</b>	MEASURED IN % VOLUME, CAN BE INDICATION OF CONDENSATION, COOLING SYSTEM LEAK, OR OUTSIDE CONTAMINATION
<b>GLYCOL:</b>	MEASURED IN % VOLUME, IN THE FORMULATION OF MOST COMMERCIAL COOLANTS
<b>OXIDATION:</b>	THIS IS THE RESULTS OF OXYGEN IN THE AIR REACTING WITH THE OIL AT ELEVATED TEMPERATURES. THIS IS A NORMAL PROCESS AS THE OIL AGES. IF AN ENGINE IS OPERATED CONTINUOUSLY AT A HIGH TEMPERATURE FOR EXTENDED PERIODS, OR IF DRAIN INTERVAL IS OVER EXTENDED, OIL CHANGE IS RECOMMENDED.
<b>NITRATION:</b>	FORMED DURING COMBUSTION PROCESS, LEADS TO ACCELERATED OIL DETERIORATION.
<b>SOOT:</b>	NORMAL COMBUSTION BY PRODUCT OF DIESEL FUEL AND APPEARS AS CONTAMINANT IN THE OIL CAUSING AN INCREASE IN VISCOSITY. INDICATE AN IMPROPER AIR/FUEL RATIO, DEFECTIVE AIR INTAKE, FAULTY INJECTORS, OR BLOW-BY
<b>VISCOSITY:</b>	CALCULATED MEASUREMENT OF THE OIL'S ABILITY TO FLOW AND LUBRICATE, INDICATES IF OIL IS TOO THICK OR THIN
<b>TBN:</b>	MEASUREMENT OF OIL'S ALKALINE BASE RESERVE, ADDITIVE IN OIL CAPABLE OF NEUTRALIZING ACIDIC CONTAMINANTS, WHEN TBN IS BELOW 3, IT IS AN INDICATION THE OIL IS NO LONGER SERVICEABLE
<b>FUEL DILUTION:</b>	MEASURED IN % VOLUME, CAN INDICATE FAULTY COMBUSTION, RICH AIR/FUEL MIXTURE WHEN PRESENT BETWEEN 2%-5%. INJECTOR PROBLEM OR INTERNAL FUEL LINE LEAK IS TYPICALLY INDICATED WHEN FUEL IS DETECTED AT HIGH LEVELS

## TRANSMISSIONS

TORQUE CONVERTER, THE CASE, THRUST WASHERS, HOUSINGS, GEAR AND VANE PUMPS
BALL AND ROLLER BEARINGS, ALLOY OF STEEL PARTS
CLUTCH PLATES, BRONZE BUSHINGS, OIL COOLER OXIDES, BRASS FITTINGS
GEARS, BEARINGS, SHAFTS, SOME CASES, CLUTCH PLATES
GEARS
SOME BEARING CAGES
AIRBORN DIRT, SEALERS, GASKETS, USED IN SOME OIL ADDITIVES, SPRAY LUBRICANTS, WHEN FOUND WITH POTASSIUM INDICATES GLYCOL ISSUE, SAND-CASTED PARTS
INDICATION OF GLYCOL OR SALTWATER INTRUSION, ADDITIVE IN SOME OILS
FOUND IN SOME OIL ADDITIVES, GLYCOL, ENVIRONMENTAL CONTAMINANT OR SALT WATER

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