



ENGINESURVEYOR.COM

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VESSEL NAME: "Lady Anaqueña" Hailing port: Long Key Florida

VESSEL DOCUMENTATION NUMBER: 1195155

DATE: February 4th 2010

LOCATION: Old Port Cove Marina North Palm Beach Florida

SURVEY PREPARED FOR: Mr. Neil Estes E-mail nestes@doylechemical.com

SEA CONDITION: Intercostal testing only

Load On Board: "Normal" load situation" Seven grown men.
Fuel one-half (50%) tank full (200 out of 350 gallons Capacity, two tanks). Water quarter full (15 out of 125 gallons capacity one tank)

HULL NUMBER: MDNH6008K506 39156-5003

TYPE OF VESSEL: Built in 2006, 2006 Model 391 Meridian Sedan Cruiser manufactured by Meridian Yachts. Cuddy cabin design, fiberglass construction with a displacement of 16,400 pounds. Four-cycle inline six cylinders turbo charged after cooled with a displacement of 5.9 liters with 808-ft/lb-engine torque Accompanied with a three cylinder four-cycle natural aspirated Onan generator producing 9.0 Kilo Watts of AC power for the ship electrical systems. The top speed experienced today with a "normal" load on board was 29.2 knots at 2830 rpm maximum speed cruise speed and of 24.5 knots @ 2600 rpm.

ALL OBSERVATION AND CONDITION IN THIS SURVEY WERE DERIVED FROM PRESSURE GAUGES TESTING AND/OR CUMMINS SOFTWARE PROGRAMMING, EXTERNAL AND WHEN POSSIBLE INTERNAL INSPECTION OF THIS VESSEL. THE FINDING ARE BASED ON THE RESULTS OF FACTS AND CONDITIONS MADE KNOW TO THE SURVEYOR AT THE TIME OF THE SURVEY. THE SURVEYORS FINDINGS ARE NOT EXPRESS OR IMPLIED WARRANTIES AS TO THE PERFORMANCE AND/OR THE LONGEVITY OF THE ENGINE.

Owner/Agent _____

Date _____



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	<i>PORT</i>	<i>STARBOARD</i>
<i>ENGINE HOUR METER:</i>	336.45	(Electrical hour meter in engine ECM memory) 350.2
<i>ENGINE SERIAL NUMBER:</i>	46529080	46580358
<i>ENGINE MODEL NUMBER:</i>	<i>QSM5.9-380HO</i>	
<i>ENGINE HORSEPOWER:</i>	<i>380 HP @ 3000 rpm</i>	
<i>TRANSMISSION MODEL#:</i>	<i>ZF 80A-2.0</i>	
<i>TRANSMISSION SERIAL #:</i>	<i>32532P</i>	<i>35539P</i>
<i>TRANSMISSION RATIO:</i>	<i>1.96: 1.0</i>	
<i>SHAFT SIZE:</i>	<i>2.0" #22 Aquamet Stainless steel shafts with no line spurs</i>	
<i>PROP SIZE:</i>	<i>"Hi torque" four bladed with a cup 23" Diameter X 26" Pitch with a minor cup. (No spare propellers found check the hull survey report)</i>	
<i>FUEL SUPPLY LINE SIZE:</i>	<i>1/2" LINE</i>	
<i>AIR INDUCTION:</i>	<i>Side vents under cap.</i>	
<i>EXHAUST SYSTEM:</i>	<i>The exhaust risers are constructed and fabricated by Marine Exhaust Systems manufacture in the recent year of 2006 .The exhaust collectors ("water can") normal life expectancy of risers is five to seven years of service in salt water environment. Due to the fact they are salt water cooled and exposed to corrosion. If they have not been checked and / or changed within this period of time it is recommended that they be tested in accordance with preventive maintenance practice. Present condition internally unknown , external leaks were detected on the starboard engine only..</i>	
<i>EXHAUST ELBOWS:</i>	<i>All fiberglass construction direct connection to water exhaust port via an exhaust hoses, no leaks observed during the test run.</i>	
<i>EXHAUST HOSES:</i>	<i>Serviceable</i>	<i>(No leaks detected) Serviceable</i>
<i>EXHAUST CLAMPS:</i>	<i>Serviceable</i>	<i>Serviceable</i>
<i>FRESH WATER SYSTEM PRESSURE:</i>	<i>15 -Lbs.</i>	

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FRESH WATER SYSTEM TEST:

No leaks observed during trial run and previous pressure test completed on engine prior to test run.

FRESH WATER CONDITION: “Standard Antifreeze” conditioner present in both engines. Supplemental coolant additives (SCA) are recommended for all Cummins engines cooling systems. Both engines fresh water system are protected presently.

Note: Excessive amounts of inhibitors in the cooling system can cause a gel or crystalline deposit that will reduce the heat transfer process (“Drop Out”) A powdery substance given off from use become gritty and cause excessive wear on seals and pumps. The present coolant condition observed contained antifreeze protection the recommended concentration level should be tested and adjusted according to OEM recommendations. There is a coolant conditioner present in cooling system. The verification of concentration recommended.

<i>FRESH WATER HOSES:</i>	<i>Serviceable</i>	<i>Serviceable.</i>
<i>FRESH WATER CLAMPS:</i>	<i>Serviceable</i>	<i>Serviceable</i>
<i>FRESH WATER PUMP:</i>	<i>Serviceable</i>	<i>(No leaks detected during test run and pressure test) Serviceable</i>
<i>ENGINE BELTS:</i>	<i>Serviceable</i>	<i>(Service as per maintenance schedule) Serviceable</i>
<i>ENGINE OIL LEVEL:</i>	<i>Over full</i>	<i>Full</i>
	<i>(Cummins Engine Company recommends the use of high quality SAE 15W-40 heavy-duty engine oil)</i>	
<i>TRANSMISSION LEVEL:</i>	<i>Full</i>	<i>Full</i>
<i>OVERFLOW BOTTLE:</i>	<i>Cleaned and filled to the proper level</i>	<i>Clean and filled to proper level</i>

TURBO TYPE: Single turbo installation fresh water-cooled. The turbo oil lines are of steel construction and normal OEM maintenance is required.

TURBO CONDITION: The turbo's were inspected and found to show no external exhaust leakage during sea trial testing. Monitor condition and service as required.

TURBO AFTER COOLERS: No leaks detected appeared in good serviceable condition. No corrosion around zinc plugs on either engine. (Cleaning and inspection of zincs suggested in maintaining engine subcomponents exposed to electrolysis to keep equipment in “bristol” condition.)

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RAW WATER SYSTEM: *The raw water intakes consist of seacocks and “ Groco ARG 2000 model” and sea scopes on the bottom of the vessel. The seacocks were tested and found to be free on starboard and free to operate on port. The water system was visually inspected before and during the trial run. No service required to get the thru hull valves free to operate with ease.*

RAW WATER HEAT EXCHANGERS: *The raw watersides of heat exchangers are expected to contain some scale. The rate of heat transfer is related directly to the build up of scale on raw waterside of heat exchanger majority of the time unless the fresh waterside has dirt or calcium build. Neither corrosion nor leaks noted on either engine. It appears that the heat exchanger has been serviced recently no reason for any service presently. The new owner should follow the O.E.M. recommendation on maintenance task to schedule next cleaning and inspection of heat exchanger cores.*

RAW WATER HOSES: *Serviceable* *Serviceable*

RAW WATER CLAMPS: *Serviceable* *Serviceable*

RAW WATER PUMP: *Serviceable* *(No leaks detected)* *Serviceable*

ENGINE GAUGES ON BRIDGE: *Factory installation, all electronic and well labeled and functional .*

ENGINE ELECTRICAL: *Protected through out the entire electrical system*

ENGINE STARTS OPERATION: *Good* *Good*

ENGINE LOW OIL ALARM: *Working* *Working*

ENGINE ALTERNATOR OPS: *13.23* *13.98*

BATTERY CONDITION:

“Serviceable” See hull survey for redundant information concerning the battery and life expectancies

ALARM SYSTEM: *Meridian Yachts. / Cummins factory warning system installed.*

ENGINE MOUNTS: *Good shape* *(Some surface corrosion present)* *Good shape*

ENGINE OIL ANALYSIS: *Oil analysis completed all wear metals and amounts of wear metals appear to be normal. (Interpreting oil analysis results is concerned with the relative values or trends of wear metal and other contaminants over a period of time. A single oil analysis for a given engine is of considerably less value than a consecutive series of analyses. The purpose of oil sample is for the purpose to bring attention to rapid wear rates recorded in single oil sample that would, should give reason for investigation and repairs.) It would be recommend t start record keeping to determine any wear containments.*

VIBRATION: *None noticeable on either engine through out all rpm ranges.*

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<i>OVERALL ENGINE APPEARANCE:</i>	<i>Clean</i>	<i>(Lacking attention to detail)</i>	<i>Clean</i>
<i>OVERALL ENGINE ROOM:</i>	<i>Clean</i>	<i>(Lacking attention to detail)</i>	<i>Clean</i>
<i>ENGINE BILGES:</i>	<i>Dirty</i>	<i>(Immediate service is required)</i>	<i>Clean</i>
<i>APPEARANCE OF TRANSOM:</i>	<i>Clean</i>		<i>Clean</i>
<i>ENGINE FUEL LINE:</i>	<i>Original</i>	<i>(“Aeroquiped” and “Parker” high pressure hoses)</i>	<i>Original</i>
<i>ENGINE OIL LINE:</i>	<i>Original</i>	<i>(Steel /good shape)</i>	<i>Original</i>
<i>TRANSMISSION OIL LINES:</i>	<i>Original</i>	<i>(“Parker “high pressure hoses)</i>	<i>Original</i>

PRIMARY FUEL FILTERS:

Single Racor 900 water separators with no vacuum gauges. Both fuel filters in fair shape, some algae present. Service is required presently (I do recommended to add a vacuum gauges).

SECONDARY FUEL FILTERS: Standard factory spin style (5285 Fleet guard) fuel filters

AIR CLEANERS: Walker Air Sep filter appears elements, which appear to be clean. No service will be required in good serviceable condition.

CONTROLS OPERATION: Single station Morse Control with Engine Electronic Controls (EEDC) the controls connected to a work with an electronic synchronizer and control assembly in engine room .

GOVERNOR: Electrical control with a mechanical lift pump

TRANSMISSION OPERATION: Good Good

OVERALL PERFORMANCE:

Good did meet factory rating of 2830+rpm with a “ full” load and no gear on board.

Diamond Performance Series High Output Range

High Output Rating: This rating is for use in variable load applications where full power is limited to one (1) hour out of every eight (8) hours of operation. Also, reduced power operations must be at or below 200 of the maximum rated RPM.

To ensure the engine is not overloaded it must be able to reach its maximum rated speed RPM at wide-open throttle.

The size of the propeller as well as the condition of the boat bottom directly affects the RPM the engine turns. If the propeller is too large or the bottom is fouled the engine will not be able to reach the proper operating limit.

If the engine is not able to reach the maximum rated speed (RPM) at a wide-open throttle, your engine may be operating in an overload condition and premature failure or shorten life may occur.

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	<i>Port Engine</i>	<i>SEA TRIAL DATA</i>	<i>Starboard Engine</i>
<i>ENGINE IDLE R.P.M.:</i>	596	<i>(Minimum 520 Low idle)</i>	598
<i>ENGINE HIGH IDLE RPM:</i>	3175	<i>(Factory set 2800-3150)</i>	3100
<i>ENGINE FULL LOAD RPM:</i>	2968	<i>(Rated 3000 rpm w/full load)</i>	2957
<i>EXHAUST COLOR START UP:</i>	<i>Minimal white smoke all normal</i>		
<i>OIL PRESSURE HOT @ FULL LOAD:</i>	<i>(Normal 30-75psi 10 psi Min @ idle) 49.8</i>		
<i>OIL TEMP @ FULL LOAD:</i>	205	<i>(Max 240)</i>	210
<i>WATER TEMP @ FULL LOAD:</i>	179	<i>(Range 195-205 Max)</i>	180
<i>SEA WATER TEMP:</i>	73		
<i>SEA WATER RETURN:</i>	103	<i>(Transfer of heat indicator)</i>	108
<i>FUEL BURN RATE FULL LOAD 2860RPM:</i>	<i>100% load</i>		<i>20.22 GPH / Each</i>
<i>FUEL BURN RATE FULL LOAD 2800RPM:</i>	<i>86 % load</i>		<i>15.71 GPH / Each</i>
<i>FUEL BURN RATE FULL LOAD 2600RPM:</i>	<i>78 % load</i>		<i>15.52 GPH / Each</i>
<i>FUEL BURN RATE AT OPTIMUM CRUISE of 2400 rpm : 68 % LOAD:</i>	<i>15.34 rpm GPH / Each</i>		
<i>FUEL TEMP IN:</i>	73		
<i>FUEL TEMP OUT:</i>	<i>Minimal amount unable to measure</i>		
<i>DRIVE OIL TEMPERATURE FULL LOAD:</i>	141		149
<i>CRANKCASE PRESSURE @ FULL LOAD: 3.8 "(H2O) (Factory has not maximum ratings posted)" 4.4" (H2O)</i>			

" Blow test" A blow-By test showed crankcase pressure to be less than 4.4" (H2O) inches on both main engines. This test shows those compression pressures that are controlled by the piston rings and liners are within/close to factory (South East Cummins service technician's specifications. The factory has not posted any rated maximum of crankcase pressure levels are determined by experience comparisons only.

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DEFICIENCIES:

Port Engine:

1) No service history, service history was requested the day of the survey to provide the prospective owner history of maintenance task and repairs to educate the new owner on tasks completed as per factory requirements to keep the equipment in good condition. Cummins has written guidelines and service intervals that must be completed to keep equipment operation within the factory standards. The new owner/ buyer must assume no maintenance task have been completed until proven. The factory has specifics task to be completed to insure engine longevity while in operation. The new owner should catch up to factory maintenance items if they have been completed at this time. The new owner should refer to the printed factory guidelines to assist on these maintenance items.

These are maintenance items that the factory has given the operator/owner a scheduled maintenance interval to keep the equipment in good condition according to their (Original Engine manufacture) OEM standards.

Cummins factory maintenance tasks in regards to the engine cooling, fuel and air induction systems

- A) Raw water impellers to be replaced (Every 1000 or 12 months)
 - B) Inspect and service the injectors (Every 1500 or 24 months)
 - C) Service and inspection of heat exchanges (Every 1500 or 24 months)
 - D) Service and inspection of intercoolers (Every 1500 or 24 Months)
 - E) Check if necessary adjust valve clearance (Every 600 hours or 12 Months)
 - F) Service air filters (Every 200 hours)
- 2) Lacking full load rpm further investigation will be required to have the ability to achieve the rated rpm of 3000 .
 - 3) The raw water pump is leaking and has been leaking service required to reseal and clean that area from the rust build up.
 - 4) The ECM is not communicating with the helm or the remote plug in adaptor to monitor readings.
 - 5) The oil level is over full draining some oil to the full mark required at this time.

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DEFICIENCIES:

Starboard Engine:

1) No service history, service history was requested the day of the survey to provide the prospective owner history of maintenance task and repairs to educate the new owner on tasks completed as per factory requirements to keep the equipment in good condition. Cummins has written guidelines and service intervals that must be completed to keep equipment operation within the factory standards. The new owner/ buyer must assume no maintenance task have been completed until proven. The factory has specific tasks to be completed to insure engine longevity while in operation. The new owner should catch up to factory maintenance items if they have been completed at this time. The new owner should refer to the printed factory guidelines to assist on these maintenance items.

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- D) Service and inspection of intercoolers (Every 1500 or 24 Months)
- E) Check if necessary adjust valve clearance (Every 600 hours)

2) Lacking full load rpm further investigation will be required to have the ability to achieve the rated rpm of 3000 .

3) Exhaust leak on the riser assembly exact location unknown service will be required to locate and repair immediately

4) The raw water connection on the raw water pump is starting to show some dry rot at that connect secure hat hoses will assist it's service life.

RECOMMENDATIONS: Repair Deficiencies noted above.

- 1) Service and inspect raw water impellers.
- 2) Check condition of zincs and replace as needed.
- 3) Start fresh with oil and fuel filter all around including transmission and generators.
- 4 Clean and inspect all coolers in the raw waterside.
- 5) Detail the entire engine room presently the engine room is dirty not a yachting standard
- 6) Fabricate a new riser for both engines with a high dead rise

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GENERATOR TYPE: *Onan with a Kubota diesel three cylinder four-cycle fresh water-cooled.*

GENERATOR MODEL: *9MDKBL-5201B*

GENERATOR ENGINE SERIAL NUMBER: *105083665*

GENERATOR ELECTRICAL END SERIAL NUMBER: *Unable to read the data tag easily*

GENERATOR HOUR METER. : *716.5*

GENERATOR OUT PUT W/LOAD: *112.1 VOLTS 60.08 + HERTZ*

GENERATOR PERFORMANCE: *Good held a full load on with no trouble, achieving 60 hertz as required.*

GENERATOR COOLING SYSTEM: *Protected and held pressure test.*

GENERATOR RAW WATER EXCHANGER: *Clean and suspect do for a cleaning as per OEM maintenance scheduling*

GENERATOR EXHAUST SYSTEM *Serviceable, no leaks detected during test run*

GENERATOR DEFICIENCIES:

1) No service history in regards to the cooling system maintenance of clean and replenish coolers and coolant.

GENERATOR RECOMMENDATION:

- 1) Continue maintenance as per the Onan handbook.*
- 2) Check and replace zincs as needed.*
- 3) Service heat exchanger as per O.E.M. scheduling.*
- 4) Replace original belts with new.*
- 5) Replace the raw water impeller with new.*
- 6) Install a scope on the bottom of the vessel to assist in the water pick up.*
- 7) The raw water intake hoses in marginal condition a replacement should be applied.*



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