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E-mail Website: www.enginesurveyor.com

VESSEL NAME: "Tuff Life II" Hailing port; Orlando Florida

VESSEL DOCUMENTATION NUMBER: 943282 (Expiration date: May 31, 2017)

DATE: August 2, 2016

LOCATION: Scorpion Marina Cape Canaveral Florida

SURVEY PREPARED FOR: Mr. Mark J. Bernet, Receiver
401 E Jackson Street 1700 Suite 1700 Tampa Florida 33602
E-mail mark.bernet@akerman.com

SEA CONDITION:
Inshore and offshore testing with a light chop and mild winds, with and against the currents.

LOAD ON BOARD: A "Good" load situation with three people and no gear on board.
(Fuel tank full according to the gauge. Water tank unknown. Holding tank empty.)
(Fuel tank capacity of two tanks 860 US gallons total and the water tank, 250 US gallons capacity)

HULL NUMBER: XYU15655L898

TYPE OF VESSEL: 1998 – 55' (55.7) Super Sport Fish with tuna tower manufactured by Ocean Yachts. Powered with a pair of turbo charged, intercooled eight cylinder Detroit Diesel Ninety two series two cycle engines rated at 735 horsepower at 2,300 rpm with a compression ratio of 17:1.0 modified by Johnson Towers Engine Company. Accompanied with a Tropical Diesel Electric Company 21KW generator four-cylinder four- cycle producing AC voltage for ships systems.

ALL OBSERVATION AND CONDITION IN THIS SURVEY WERE DERIVED FROM PRESSURE GAUGES TESTING AND/OR EXTERNAL AND WHEN POSSIBLE INTERNAL INSPECTION OF THE ENGINES. THE FINDING IS 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. THERE WAS NO TROUBLE SHOOTING INVOLVED ON ANY OF THE EQUIPMENT MERELY AN INPECTION SURVEY.

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	PORT	STARBOARD
ENGINE HOUR METER:	2,470.3 (Single hour meter in the salon, actual engine hours unknown)	
ENGINE SERIAL NUMBER:	8VF128420 (Serial number difficult to read)	Unable to read
ENGINE MODEL NUMBER:	8082-3303 (8V92TIB)	8082-7303
ENGINE HORSEPOWER RATING:	735 HP @ 2,300 rpm	
TRANSMISSION MODEL#:	Capital HY-2500(Unable to read the data tag)	
TRANSMISSION SERIAL #:	11098-0288	Unable to read the data tag present
TRANSMISSION RATIO:	(Actual ratio unknown, suspect 1.53:1.0)	
SHAFT SIZE:	2.0” Armco Aguamet # 22 Stainless steel shafts.	
SHAFT SEALS:	Dripless shaft seals with forced cooling hoses and a cross over feed.	

PROP SIZE: Three bladed with no cup unknown” Diameter and unknown” Pitch size. (Service is required to reconditioning the starboard propeller presently out of balance I do recommend that new owner would recondition both propellers to have in perfect condition)

SHAFT STRUT BEARINGS: There is an intermediate strut bearing and aft strut bearing. The aft strut bearings was inspected and found to be both worn and presently due for recondition. I was unable to inspect the intermediate strut bearings.

FUEL SUPPLY LINE SIZE: Original 3/4 high-pressure steel braded hoses due for service on the main engines and generator.

FUEL RETURN LINE: Original, due for service as a preventive maintenance task.

AIR INDUCTION: Side vents under cap and side vents on the hull.

ENGINE ROOM BLOWERS: Functional DC volt blowers in the engine room.

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EXHAUST SYSTEM: The exhaust risers are constructed and fabricated by unknown exhaust systems vendor. The exhaust collectors ("water can") normal life expectancy of risers is five to seven years. Present condition internally unknown, no leaks were detected. It is recommended following the exhaust riser's manufacture suggested service interval and completing an inspection every five-seven years. (No documentation provided to determine the in-service date of the risers).

EXHAUST SYSTEM: This is an important item to verify when the in- service dates of these risers are and follow the recommended inspection and replacements as required.

EXHAUST ELBOWS: Fiberglass surge tube present, via a hose connection to a fiberglass in-line muffler, which are manufactured by marine exhaust systems.

EXHAUST SUPPORT BRACKET: No support bracket necessary small riser connected to the turbo.

EXHAUST HOSES: Serviceable (No leaks detected during the test run) Serviceable

EXHAUST CLAMPS: Serviceable (Majority of the clamps are good shape) Serviceable

FRESH WATER SYSTEM PRESSURE: 7-Lbs.

FRESH WATER SYSTEM TEST: Held standard coolant pressure test before we left the dock on both engines.

FRESH WATER "BLOCK HEATER": No block heaters present non either engine at this time. (Suggested to use on cold start-up to prevent wear year round).

FRESH WATER CONDITION: A weak concentration of coolant inhibitor is present in both engines; inhibitor is not an anti-freeze protected coolant. The present coolant condition as observed is out of the factory specifications.

This is not the proper concentration of supplemental coolant additive (SCA) that is recommended for all Detroit Diesel engines cooling system. (Not recommended, but required to flush and replenish with the Detroit Diesel Power Coolant inhibitor to assure the contents and the strength for winter protection.)

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Note: Coolant additives (SCA) are recommended for all Detroit Diesel engines cooling systems. Both engine's fresh water systems are not adequately protected in my opinion. It is our recommendation to flush and replenish with MTU Power Cool Inhibitor the recommended SCA coolant as a preventive maintenance practice for both main engines at this time. Heavy-duty diesel engines require a balanced coolant mixture of water and antifreeze. Coolant system must be periodically drained and flushed to eliminate buildup of harmful chemicals.

Use "soft" water in the coolant mixture. Contaminates in hard water neutralize the corrosion inhibitor components. Water must not exceed 300-ppm hardness, or contain more than 100 ppm of either chloride or sulfate.

Excessive amounts of inhibitors in the cooling system can cause a gel or crystalline deposit that will reduce the heat transfer process called "Drop Out". The present coolant condition observed contained little to no protection. The recommended concentration level should be tested and adjusted according to OEM recommendations, immediately to have that protection.

FRESH WATER HOSES: Serviceable (Majority of the hoses are harden) Serviceable

FRESH WATER CLAMPS: Serviceable (Majority of the clamps have been replaced) Serviceable

FRESH WATER PUMP: Serviceable (No leaks detected during test run and pressure test) Serviceable

COOLANT OVERFLOW BOTTLE: Overflow bottles are applied on this vessel, both bottles are in poor shape and low on coolant service will be required.

ENGINE BELTS: Belts on this application for the alternators only.

ENGINE OIL LEVEL: Full (Straight 40W Motor Oil) Full

ENGINE OIL FILTER: Full flow with By-pass valve

TRANSMISSION LEVEL: Low attention required (30 or 40W Motor oil only) Over full attention required

TURBO TYPE: Single Garret turbo installation on this application "Water cooled style" no insulation of asbestos blankets required. The turbo oil supply is an Aeroquip steel braded high pressure hose; life expectancy is rated for five years. Inspected for dry rot, chafing and leaks, both supply lines appear to be in serviceable condition. All the high-pressure hose are not original and in good serviceable condition.

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TURBO INTERCOOLERS: Good performance throughout all rpm operations. Unable to visually inspect. Suspect both units have not been cleaned any time recently. (There was smoke on acceleration, a normal condition a tight tune up may minimize, as well Blue printing the turbo to close up the clearances. This is an important item to know when it was serviced to keep up with the normal service intervals). (Documentation from the in frame repair should be collected to determine if the intercoolers were disassembled pressure tested inspected).

TURBO HIGH PRESSURE SUPPLY HOSES: The turbo oil supply is an Aeroquip high pressure hose; life expectancy is rated for five years. Inspected for dry rot, chafing and leaks both supply lines, some of the lines appear to be original and in service within the normal life expectancies.

TURBO CONDITION: The turbo's were inspected; no external leakage found during the test trial test and the visual inspection prior to test run. Blue printing the turbo's is always a good suggestion to have the maximum performance and minimize any smoke n acceleration

TURBO BLANKETS: No blankets applicable on this model engine.

ENEGENCY CRASH VALVES / PICK UPS: No crash valves are applicable on this vessel.

RAW WATER SYSTEM: The raw water intakes consist of seacock and Sendure hull type sea strainers on the bottom of the vessel. The seacocks were tested and found frozen, no movement for neither engine intake valve, service will be required to have functional. The water system was visually inspected before and during the trial run.

This report is subject to the condition that it is understood and agreed that neither this office nor any surveyor or any employee thereof is under any circumstance whatsoever to be held responsible in any way for any error in judgment, default or negligence nor for any inaccuracy, omission, misrepresentation or misstatement in this report, and that the use of this report.

RAW WATER HEAT EXCHANGERS: The intake sides of the engine water heat exchangers are expected to contain some scale. The rate of heat transfer is related directly to the amount of scale on the intake side of the heat exchanger. Corrosion was noted on the zinc plus only, no leaks noted on both engines during this survey. It is standard for this service to be done every few years as a preventive task. I expect that service will be required as a preventive maintenance task. Neither report by the owner, nor any proof provided of what service has been completed as of this date.

This report is subject to the condition that it is understood and agreed that neither this office nor any surveyor or any employee thereof is under any circumstance whatsoever to be held responsible in any way for any error in judgment, default or negligence nor for any inaccuracy, omission, misrepresentation or misstatement in this report, and that the use of this report.

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RAW WATER HOSES: Service required (Majority of the hoses are harden) Service required

RAW WATER CLAMPS: Serviceable (None of the clamps presently painted) Serviceable

RAW WATER PUMP: Serviceable (No leaks was detected before and during test run) Serviceable

ENGINE GAUGES ON BRIDGE: Electrical gauges which did prove functional.

ENGINE ROOM GAUGES: No mechanical engine room gauges. (It is suggested to add engine and transmission oil pressure and the water temperature gauges)

ENGINE PRE-LUBBER: No pre-lubber installed on this vessel it is a suggestion only.

ENGINE ROOM LIGHTING: Both AC and DC lighting present and functional.

ENGINE ELECTRICAL: No protection is applied on the starter hot leads for accidental contact.

ENGINE START OPERATION: Good start operation Good start operation

ENGINE LOW OIL ALARM: Proved to be functional and attention is suggested to prove the high coolant alarm is functional before an actual over heat occurs.

ALARM SYSTEM: Ocean Yachts /Detroit Diesel factory warning system installed. The engine low oil pressure alarm is functional. All the alarms (Water temperature) should be tested to prove beyond any doubt to void any catastrophic failure due to lack of warning.

ENGINE ALTERNATOR OPS: 12.5 (12 Volt AC Delco 110 Amp) 13.4

BATTERY CONDITION: Fair condition. Four 8D batteries located inboard of the engines.

BATTERY SWITCHES: No battery switches provided as a normal ABYC recommendation to have for that safety reason.

ENGINE OIL ANALYSIS: See Motor Check Report (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)

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ENGINE MOUNTS:
Fair shape (Steel mounts on the front and rear manufactured by Detroit Diesel) Fair shape

VIBRATION: The presence of vibrations throughout the entire test run. It appears to be coming from the starboard engine and shaft assembly.

OVERALL ENGINE APPEARANCE: Lacking attention to detail.

OVERALL ENGINE ROOM: Fair (Attention is required to replace missing decking and cleaning up) Fair

ENGINE BILGES: Dirty (Minimal attention required to have in Bristol condition) Dirty

APPEARANCE OF TRANSOM: Clean Clean

ENGINE FUEL LINE: Serviceable (Some of the hoses are original) Serviceable

ENGINE OIL LINE: Serviceable (Some of the hoses appear to be original) Serviceable

TRANSMISSION OIL LINES: Service required (All of the hoses are original) Service required

FUEL COOLERS: Fuel cooler is present. It is a suggested to go through the preventive maintenance task of flushing and cleaning. It is apparent that it hasn't been completed any time recently.

Note: Fuel can be burned in an engine only after it has been vaporized. The temperature at which fuel is completely vaporized is described as the finial boiling point. The boiling point should be low enough to permit complete evaporations at combustion chamber temperatures. The fuel temperature is critical factor in performance engine it cools and lubricates internal components in the engine. Refer to your owner manuals for the service interval periods that are suggested.

INJECTOR SIZE: No spares injectors were found on board. It is unknown what size injector.

INLINE FUEL PURIFIFIERS: Not applicable on this vessel

FUEL PRIMERS: No fuel primer applicable on this vessel It is suggested to add DC electrical fuel primers.

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PRIMARY FUEL FILTERS: Single Racor 1000 MA model water separators with no vacuum gauges both filters appear to be in poor condition. Service is required to flush the slight bowls, remove the sludge and water present as well as repairing the port side drain bowl fitting presently allowing air to enter the system and removal of paint over spray to allow easy view of the contents within.

Note: The quality of fuel oil used for high-speed diesels engine operation is very important factor in obtaining satisfactory engine performance, long life and acceptable exhaust emission levels. The fuel should be clean and free of containments. Please refer to your owner manuals on handling and care for your fuel there are conditioners and stabilizers and other methods to protect and or clean the fuel present you might want to ask your supplier what there Cetane levels are. The lower the ambient temperatures the greater the need for a higher Cetane fuel that will ignite rapidly.

SECONDARY FUEL FILTERS: Standard spin on style fuel filters

Note: Fuel can be burned in an engine only after it has been vaporized. The temperature at which fuel is completely vaporized is described as the final boiling point. The boiling point should be low enough to permit complete evaporation at combustion chamber temperatures. The fuel temperature is a critical factor in engine performance as it cools and lubricates the internal components of the engine. Refer to the owner's manual for the suggested service intervals.

FUEL CONDITION: Both sediment and water present in the Racor slight bowls. I suggested that you use a fuel additive regardless to prevent trouble in the future.

Note: As if you didn't already know Mark

Suggested additives for microbial growth control are:

1. Power Service Bio Kleen Diesel Fuel Biocide

http://www.powerservice.com/bk/

2. Stanadyne Performance Formula

http://www.stanadyne.com/view.php?id=74

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Note: The quality of fuel oil used for high-speed diesels engine operation is very important factor in obtaining satisfactory engine performance, long life and acceptable exhaust emission levels. The fuel should be clean and free of containments. Please refer to your owner manuals on handling and care for your fuel there are conditioners and stabilizers and other methods to protect and or clean the fuel present you might want to ask your supplier what there Cetane levels are. The lower the ambient temperatures the greater the need for a higher Cetane fuel that will ignite rapidly.

AIR CLEANERS: Factory Air Sox filters which were found to be dirty. Service to the filter is suggested at this time.

AIR FILTER INDICATOR: Not applicable on this style air filter.

CONTROLS OPERATION: Triple station Hynautic controlled which proved to be functional throughout the test run.

GOVERNOR: Variable speed mechanical governor

ENGINE EMERGENCY SHUT DOWN: Emergency shut down not functional , neither cable nor solenoid present on this application it is a suggestion only. So often this is installed on the lower station.

ENGINE TROLLING VALVES: No trolling valve present on this application.

TRANSMISSION OPERATION: Good Good

OVERALL PERFORMANCE: Good (Low on rated rpm's, other quick to start with next to no smoke) Good

SERVICE HISTORY: A service history was requested the day of the survey to provide the prospective owner a history of maintenance task and repairs completed and to educate the new owner on tasks required as per factory requirements/recommendations to keep the equipment in Bristol condition.

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Detroit Diesel has written guidelines and service intervals that must be completed to keep the equipment operational within the factory standards; no information has been provided from the owner nor was any receipts were available for review. The new owner/buyer must assume maintenance tasks have not been completed until proven. The factory has specifics tasks to be completed timely to insure engine longevity. The new owner should comply with factory guild lines. (Engine reported to be in frame repair, documentation was provided and Rod did verify that information which engine and when and by whom the day of the survey).

Engine deterioration and wear occur in proportion to the time the engine has been in service and the conditions the engine is subjected to during operation. Periodic maintenance prevents unexpected downtime, reduces the number of accidents due to poor engine performance and helps extend the life of the engines. The new owner should refer to factory guild lines to determine what service is necessary.

Low operating and maintenance costs as well as operational reliability and availability depend on maintenance and servicing being carried out in compliance with factory specifications, recommendations and instructions.

Note: High Performance diesels require frequent maintenance to maintain full RPM potential. Continuous operation should not exceed 75-80% while full throttle should be limited to 10 % or ten (10) minutes every hour to obtain maximum life and minimize fuel consumption. Operation at continues full throttle may shorten engine life.

TRIAL DATA

	Port Engine		Starboard Engine
ENGINE IDLE R.P.M.:	632	(Minimum 550)	636
ENGINE HIGH IDLE RPM:	Not tested	(Normally Factory set @ 2500 rpm)	Not tested
ENGINE FULL 100% LOAD RPM:	2,083	(Rated 2,300 rpm w/full load)	2,150 - 22.4 knots
EXHAUST COLOR START UP:	Minimal white smoke “a good start “for a warm two-cycle engine,		
OIL PRESSURE HOT @ FULL LOAD:	55	(Normal 40-70)	56
OIL TEMP FULL LOAD:	227	(Max 240 max)	223

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TRIAL DATA

	Port Engine		Starboard Engine
WATER TEMP FULL LOAD:	177	(Range 160-195 Max)	175
SEA WATER TEMP:	87		
SEA WATER RETURN:	111 (Transfer of heat indicator)		107
FUEL TEMP IN:	87		
FUEL TEMP OUT:	Minimal amount unable to measure		
DRIVE OIL TEMPERATURE FULL LOAD:	121		117
DRIVE PRESSURE @ FULL LOAD:	178 psi		250 psi
CRANKCASE PRESSURE @ FULL LOAD:	3.89 "	(Max 3.5")	3.95"

"Blow test" A blow-By test shows crankcase pressure. The factory rated maximum of 3.5" crankcase pressure are considered high for both engines . Please understand that the crankcase pressure readings are subject to the air restriction that a crankcase breather filter may/may not obstruct the airflow thus allowing a buildup of air in the crankcase. (I suspect that the air box check valves are partially open thus allowing boost pressure to enter the crankcase sump. This should be verified or have the check valves replaced with new.)

Service of the custom-made air box collectors may be required to verify that these reading are the accurate and not showing higher than actual due to an obstructed breather. This test was conducted with no service nor any inspection to the breather prior to test run.

The results of the crankcase pressure reading normally relate to the wear condition on the engine due to a) either the compression passing by the compression rings on the pistons or b) the turbo boost entering the oil lubrication via a bad seal on turbo charger or c) a malfunction air box check valve or d) a restricted breather or a worn valve guide, all these items should be consider when evaluating the results Oil samples may indicate a high contamination of chrome or aluminum and that would lead to eliminate the piston rings or the turbo charger seals.

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Please note "The data obtained by the blow by meter only as additional information concerning engine condition and not as a stand-alone good/bad indicator of engine condition. Do not use the data alone to determine if the engine should be rebuilt. Other indicators such as high oil consumption, low power, hard starting, and excessive fuel consumption must be considered."

BOTH ENGINE CYLINDER KIT CONDITION INSPECTED RANDOMLY ON THE BOTH ENGINE.

ENDOSCOPIC INSPECTION: Both engine cylinder inspections found to be in normal condition in regards to cylinder liners. The port engine cylinder kits cross hash marks present, minimal scuffing and scouring, the starboard cross hash marks present, minimal scuffing and scoring on the cylinder liner walls present. This was discovered during all the cylinder endoscopic inspection prior to the test run on for both engines. Don't hesitate to contact the local dealer to further educate you in regards to the term of "cross hash" and the effect on the cylinder liner and pistons.

AIR BOX CONDITION: The port and starboard engine air box was dry with some carbon present.

COMPRESSION TEST: No compression test completed at this time this is an option. To best determine cylinder condition, (rings and liners) a cylinder compression/leak down test would have to be performed. Cylinder compression/leak down test is performed only if requested. This test is not included in this survey and cost extra

Deficiencies are important issues that will require immediate attention for the safety of the vessel and people onboard and longevity of these engines.

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DEFICIENCIES: Port Engine:

1) No recent documentation of any service history in regards to; (Follow up with JT and obtain all this history to properly schedule the next service task. For the obvious there are no service records for the buyer to review)

a) Heat exchanger.
b) Gear / fuel cooler.
c) Tune ups
d) Coolant flushes
e) Impeller service
f) Zinc inspections

2) Some of the high pressure fuel lines (supply and return) are original and in service beyond the normal service life expectancies'.
3) The engine never turned the rated rpm of 2,300 immediate attention will be required to have the ability to achieve the rated room and not have an over load situation which would cause premature failure and other heavy load factors like smoking on acceleration and high coolant temperatures.
4) The oil change hose is improperly secured and appears to be a harden hoses with no shut off valve on the oil pan which should be added as a safety fixture.
5) The engine intake thru hull valve frozen in movement.
6) No protective cover on the starter hot leads.
7) The alternator belts are not matched present and immediate attention required to replace and start with new.
8) The engine alternator belt guard is missing.
9) Some of the high pressure hoses are original presently in service beyond what the manufacture has intended for normal service life.
10) Some of the fresh water hoses are hardened they should be replaced with new to have in Bristol conidtion.
11) A lot of paint over spray on the primary fuel filter service required to clean up.
12) The Racor sight bowl showing a lot over spray paint present service suggested to clean up to have a clear view.
13) Over flow bottle in poor conidtion service required to clean and or flush it is suggested to replace with new at this time.
14) The transmission oil level is low additional oil is required.
15) The fly bridge tachometer slightly off calibration showing higher than actual ab adjustment is suggested.
16) No service history in regards to the transmission oil and filter should be serviced at this time

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DEFICIENCIES: Port Engine:

17) Smoke present on acceleration further investigation in regards to the fuel modulator pollution control device and or the boost pressure differential before and after the intercooler and or the clearances of the turbo exhaust housing to achieve fast acceleration with minimal smoke.
18) Some of the shaft log hose clamps showing surface corrosion (Normal) Replacements should be provided at this time.
19) Some of the shaft log hose clamps showing surface corrosion (Normal) Replacements should be provided at this time.
20) The zinc plugs on the heat exchanger badly corroded an obvious indicator that routine maintenance for this galvanic protection hasn't been applied as a routine for that required protection.
21) The engine coolant inhibitor is weak immediate attention to flush and provide adequate protection as prescribed in the Detroit Diesel service manual for the protection.
22) The raw water piping on the outboard side of the motor badly corroded and it doesn't appear to be bonded for galvanic corrosion protection.
23) The presence of raw water leak on the discharge piping from a broken hoses clamp on the hardened raw water hose will require attention.
24) The intercooler shows sign of corrosion present (They have been painted over).
25) No battery switches for the main engine.
26) The fresh water tank gauge for the vessel is inoperable.
27) The foam air filter present sagging (Normal situation) replacement air sock is suggested at is time.
28) The bilges are dirty service suggested to clean up to have in Bristol conidtion.
29) The cutlass bearing showing wear.
30) The gear pressure showing slightly low on the helm gauge, testing and verifying is required.
31) The alternator output on the helm display low testing on the alternator and verifying is required and possible service.
32) Missing a knob for the lower station throttle control handle.

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DEFICIENCIES: Starboard Engine:

1) No recent documentation of any service history in regards to; (Follow up with JT and obtain all this history to properly schedule the next service task.)
   a) Heat exchanger. (JT tube bundle)
   b) Gear / fuel cooler
   c) Tune ups
   d) Coolant flushes
   e) Impeller service
   f) Zinc inspections
2) Some of the high pressure fuel lines (supply and return) are original and in service beyond the normal service life expectancies'.
3) Some of the high pressure hoses are original presently in service beyond what the manufacture has intended for a normal service life.
4) Some of the fresh water hoses are hardened they should be replaced with new to have in Bristol conidtion.
5) Smoke present on acceleration further investigation in regards to the fuel modulator pollution control device and or the boost pressure differential before and after the intercooler and or the clearances of the turbo exhaust housing to achieve fast acceleration with minimal smoke.
6) The raw water piping on the outboard side of the motor badly corroded and it doesn't appear to be bonded for galvanic corrosion protection.
7) Some of the shaft log hoses clamps showing surface corrosion (Normal) Replacements should be provided at this time.
8) The zinc plugs on the heat exchanger badly corroded an obvious indicator that routine maintenance for this galvanic protection hasn't been applied as a routine for that required protection.
9) The engine coolant inhibitor is weak immediate attention to flush and provide adequate protection as prescribed in the Detroit Diesel service manual for the protection.
10) The engine never turned the rated rpm of 2,300 immediate attention will be required to have the ability to achieve the rated room and not have an over load situation which would cause premature failure and other heavy load factors like smoking on acceleration. (Suspect the pollution control device may be holding the port engine back from the rated rpms).
11) The engine intake hose is showing some wire a replacement is required at this time.
12) The intercooler shows sign of corrosion present (They have been painted over)
13) Over flow bottle in poor conidtion service required to clean and or flush it is suggested to replace with new at this time.
14) The starter hot leads not protected from accidently contact.

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DEFICIENCIES: Starboard Engine:

15) The fuel supply and return lines appear to be original.
16) Smoke present on acceleration further investigation in regards to the fuel modulator population control device and or the boost pressure differential before and after the intercooler and or the clearances of the turbo exhaust housing to achieve fast acceleration with minimal smoke.
17) The presence of water in the Primary fuel filter immediate attention required flushing the Racor's and consideration to circulation of the fuel tank is suggested as well as starting fuel treatment.
18) The Racor sight bowl showing over spray paint present service suggested to clean up to have clear view.
19) The fly bridge tachometer slightly off calibration showing higher than actual. And adjustment is suggested.
20) No service history in regards to the transmission oil and filter should be serviced at this time.
21) The heat exchanger tank is not bonded for galvanic corrosion protection.
22) The foam air filter present sagging (Normal situation) replacement air sock is suggested at is time.
23) The bilges are dirty service suggested to clean up to have in Bristol conidtion.
29) The transmission high pressure line are harden and in service beyond normal service life expediencies' replacement is required at this time
30) The engine rear seal is leaking allowing carbon to enter the transmission.
31) The transmission is over full of oil immediate attention is required.
32) Vibration present while under way reconditioning the wheel and or an engine alignment is suggested to smooth out the performance.
33) No battery switches for the main engine.
34) The cutlass bearing showing wear.
35) The propeller didn't track true at the haul out inspection recondition the propeller is required to minimize any vibration
36) The propeller shaft turned with some difficulty out of the water. (Not a normal situation for a boat to be in obviously) Checking the engine alignment is suggested at this time.
37) Missing a knob for the lower station throttle control handle.
38) The oil samples contamination should abnormal wear on the transmission and high level of sodium service will be required.

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RECOMMENDATIONS: (These items below are suggestions and suggestions only that may be critical to the operation to the vessel from my experience)

1) Replace the raw pump impeller at that time and service the cooling system.
2) Service and inspection of Zincs to assure a good bond and galvanic protection.
3) Change oil and clean /inspect the filters on transmissions.
4) Detail the engine room.
5) Start using the fuel treatment/ conditioner known as Biobar /Kleen.
6) Go through the engine tune up thoroughly and immediately to assure performance.
7) Go over the entire clamp in the entire engine room and check for tightness.
8) Add and use engine block heaters year round especially a day before starting this will minimize the wear and tear of a cold start up and allow quick oil supply and minimizes any smoke.
9) Go over all the high-pressure hoses carefully to assure that no chafing is occurring if so provide that required protection.
10) Strongly suggest that the high temperature alarm is proven functional.
11) Always consider scheduling these service tasks, in reference to;
    a) Heat exchanger (JT bundle type)
    b) Coolant flushes
    c) Gear / fuel cooler
    d) Tune ups
    e) Fuel filter service
    f) Transmission service
    g) Engine oil change.
    h) Impeller service
    i) Zinc inspections and replacements
13) Dump the engine coolant and replenish with good strength of coolant inhibitor.
14) Pull the transmission oil filter and check the contents.
15) Add engine room manual gauges in regards for oil pressure as well as engine coolant temperature.
16) Consider replacing the JT aluminum exhaust manifolds with Detroit Diesel Cast iron.
17) Consideration to polishing the fuel tanks is suggested.
18) Consider replace the Racor sight bowls with new to have a clear unobstructed view of the contents within.
19) Remove and check the shaft log hoses clamps for any obstruction. Good raw water flow is important.
20) Remove and replace all the Zinc's on the cooling system to assure good galvanic protection for the coolers.
21) Add an emergency shut cable for the engine blower air shut down housing.

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22) The crankcase pressure slighted elevated during the test run I suspect that air box check valves are not fully closing and or the home made air box collectors maybe obstructed for good ventilation.
23) The fuel gauges showed that it was full, don't know how accurate these are gauges are if they are accurate at all. I suggest that you verify that information.
24) Seek the last in frame repair and obtain the hours and date to better estimate what the actual engine hours may be.

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GENERATOR MODEL:
TDEG (Tropical Diesel Electrical generator), four-cylinder 1,800-rpm diesel Isuzu engine.

GENERATOR RATING: 12.5 BTDA (21 KW)

GENERATOR SERIAL NUMBER: 123374

GENERATOR ENGINE MODEL: 4LE1 PV-02 (AE/JJ)

GENERATOR HOUR METER: 437.2 (Hour meter on unit).

GENERATOR OUT PUT W/LOAD: 118 VOLTS 59+ HERTZ

GENERATOR PERFORMANCE: Good with a minimal load

GENERATOR FRESH WATER COOLING SYSTEM: Good coolant inhibitor present.

GENERATOR PRIMARY FUEL: Single Racor 500MA fuel water separator present

GENERATOR SECONDARY FUEL FILTER: Present on the unit.

GENERATOR RAW WATER EXCHANGER: The raw water intake protected with a Groco ARG 750 sea strainer with a functional thru hull valve. . No corrosion present normal maintenance interval service. (Last completion unknown, presently due) will be required to keep unit in normal condition.

GENERATOR EXHAUST SYSTEM: Centek muffler with removable drain plug.

GENERATOR DEFICIENCIES:
1) No service history for the new owner to follow.
2) The alternator not connected nor proven functional
3) No battery switch for the generator as a normal ABYC item to have for safety.
4) The exhaust discharge is custom made and protected from accidental contact. The piping is galvanized piping and presently not bonded for galvanic protection.

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GENERATOR DEFICIENCIES:

5) No service history in regards to;
- a) In service date
- b) Heat exchanger service
- c) Coolant flush
- d)Zinc inspection.
- e) Impeller service

6) Fuel line lying on the hot exhaust piping rerouting is required.

GENERATOR RECOMMENDATION:
1) Continue maintenance as per the owner's handbook.
2) Check and replace zincs as needed.
3) Address the cooling system in regards to a coolant flush.

This report is prepared and submitted in confidence for the exclusive use for Mr. Mark J Bernet, [Principal under contract], for whom the survey was performed and no changes or supplements are permitted unless provided by Engine Surveyors LLC.

All observations and conditions in this survey were derived from pressure gauge testing and external and when possible internal inspection of these engines on this vessel. The findings are based on the results of facts and conditions made known to the surveyor at the time (day of) of the survey. The surveyor's findings are not express or implied warranties as to the performance and or the longevity of the engines and or the transmission or generators. Use of this report constitutes acceptance of these conditions and terms and those of the Scope of Survey, its limitations and advisories, and any other specified limiting conditions, inferences or restrictions hereof. Engine Surveyors LLC. nor its agents have present or prospective interest in the vessel that is the subject of this report and further, has no personal interest or bias with respect to the parties involved.

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