

**Associated Marine Surveyors**  
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## **ENGINE AND GENERATOR SURVEY**

**M/Y “ XXXXXXXXXX ”**

**December 19- 21, 2004**

## Starboard Engine

Make: JT Detroit Diesel      Model: 8V92 TIB      Serial: 08VF126142      Year: 1988/89

H.P.: 730-750      Injector: 5670H

Max. No Load RPM: Specify 2500      Attained 2641      +141 RPM

Max. Full Load RPM: Specify 2300      Attained 2166      -134 RPM

Hours: 2514 (per meter).

All pressure in PSI and temperature in °F. unless stated otherwise.

	RPM	OIL PRESS	COOL TEMP	OIL TEMP	A/B PRESS	C/C PRESS	FUEL PRESS	EXH. B.PRESS	CLUTCH PRESS	CLUTCH TEMP
IDLE	582	21	163	184	N/A	N/A	45	N/A	225	N/A
F/ LOAD	2166	40	194	207	30+Hg	2.8" H2O	65	1.5 Hg.	225	137

Compression readings taken with engine @ 150°F. @ 600 RPM.

Normal 500 PSI Minimum 450 PSI.

#1 LB	420	-30		#1 RB	400	-50
#2 LB	415	-35		#2 RB	400	-50
#3 LB	410	-40		#3 RB	425	-25
#4 LB	445	-5		#4 RB	420	-30

### Air Box inspection.

Air boxes were oily but not excessively so. All rings look pretty worn; although they still have spring to them. There is some vertical streaking indicating compression passing rings. #3 and #4 LB air box couldn't be accessed due to cooling line interference.

#1 LB Rings are without wear indicating grooves. Piston skirt shows light scoring. Liner shows some rust with crosshatch still visible and light vertical scoring.

#2 LB Rings are without wear indicating grooves. Piston skirt shows light scoring. Liner shows some rust with crosshatch still visible and light vertical scoring.

#3 LB Not accessible.

#4 LB Not accessible.

#1 RB Rings are without wear indicating grooves. Piston skirt shows light scoring. Liner shows some rust with crosshatch still visible with scuffing and light vertical scoring.

#2 RB Rings are without wear indicating grooves. Piston skirt shows light scoring. Liner shows some rust with crosshatch still visible and light vertical scoring.

#3 RB Rings are without wear indicating grooves and top ring lands scuffed. Piston skirt shows light to moderate scoring. Liner shows some rust with some crosshatch still visible and light vertical scoring.

#4 RB Rings are without wear indicating grooves. Piston skirt shows light scoring. Liner shows some rust with crosshatch still visible and light vertical scoring.

### OBSERVATIONS:

At full load engine temperature would not stabilize and slowly rose to over 190 F.

Starboard engine vibrated more than Port engine at all speeds.

Engine throttle linkage is sloppy.

## Port Engine

Make: JT Detroit Diesel      Model: 8V92 TIB      Serial: 08VF126112      Year: 1988/89

H.P.: 730-750      Injector: 5670H

Max. No Load RPM: Specify 2500      Attained 2641      +141 RPM

Max. Full Load RPM: Specify 2300      Attained 2166      -134 RPM

Hours: 2936 (per meter).

	RPM	OIL PRESS	COOL TEMP	OIL TEMP	A/B PRESS	C/C PRESS	FUEL PRESS	EXH. B.PRESS	CLUTCH PRESS	CLUTCH TEMP
IDLE	625	25	166	182	N/A	N/A	45	N/A	225	N/A
F/ LOAD	2177	42	192	209	30+Hg	2.8" H2O	65	1.5 Hg.	225	138

Compression readings taken with engine @ 150°F. @ 600 RPM.

Normal 500 PSI Minimum 450 PSI.

#3 LB and #3 RB injectors couldn't be removed with normal pressure.

#1 LB	475			#1 RB	445	-5
#2 LB	460			#2 RB	440	-10
#3 LB	N/A			#3 RB	N/A	
#4 LB	450			#4 RB	445	-5

### Air Box inspection.

Air boxes were oily but not excessively so. All rings look pretty worn although they still have spring to them. There is some vertical streaking indicating compression passing rings.

- #1 LB Rings are without wear indicating grooves. Piston skirt shows light scoring. Liner shows some rust with crosshatch still visible and light vertical scoring.
- #2 LB Rings are without wear indicating grooves. Piston skirt shows light to moderate scoring. Liner shows some rust with crosshatch still visible and light vertical scoring.
- #3 LB Rings are without wear indicating grooves. Piston skirt shows light scoring. Liner shows some rust with crosshatch still visible and moderate vertical scoring.
- #4 LB Rings are without wear indicating grooves. Piston skirt shows light scoring. Liner shows some rust with crosshatch still visible and light vertical scoring.
- #1 RB Rings are without wear indicating grooves. Piston skirt shows moderate scoring. Liner shows some rust with crosshatch still visible and light vertical scoring.
- #2 RB Rings are without wear indicating grooves. Piston skirt shows light scoring. Liner shows some rust with crosshatch still visible moderate vertical scoring.
- #3 RB Rings are without wear indicating grooves and top ring lands scuffed. Piston skirt shows light to moderate scoring. Liner shows some rust with some crosshatch still visible and moderate vertical scoring.
- #4 RB Rings are without wear indicating grooves. Piston skirt shows moderate scoring. Liner shows some rust with crosshatch still visible and moderate vertical scoring.

### OBSERVATIONS:

At full load engine temperature would not stabilize and slowly rose to over 190 F.  
Evidence of coupling rubber in bilge under flywheel housing.

## Port Generator

Make: Northern Lights                      Model: M-844L                      Serial: N/A                      Year: N/A  
kW.: 20                      Hours: 3351 (per meter).                      RPM: 1800                      Hz: 60  
Oil Pressure: 48 PSI                      Coolant Temp: 190                      Volts: 13.8

Compression readings taken cold with starter motor.  
Compression specification 355-380 PSI.

#1                      380 PSI  
#2                      380 PSI  
#3                      380 PSI  
#4                      380 PSI

Engine started easily with normal smoke and ran well under full load.

Cooling system:                      Good, no apparent leaks  
Lube Oil system:                      Good, no apparent leaks.  
Fuel system:                      Leakage around fuel inj. pump.

## Starboard Generator

Make: Northern Lights                      Model: M-844L                      Serial: N/A                      Year: N/A  
kW.: 20                      Hours: 3351 (per meter).                      RPM: 1800                      Hz: 60  
Oil Pressure: N/A                      Coolant Temp: N/A                      Volts: N/A

Compression readings taken cold with starter motor.  
Compression specification 355-380 PSI.

#1                      380 PSI  
#2                      340 PSI -15 PSI  
#3                      380 PSI  
#4                      380 PSI

Engine would not start initially. Yard personnel filled racor filter and started.  
Upon re-starting next day generator started and ran for a few minutes and then ran out of fuel.

Cooling system:                      Good, no apparent leaks  
Lube Oil system:                      Good, no apparent leaks.  
Fuel system:                      Leakage back to main fuel tank from racor.

## **Air and Exhaust System Main Engines** (Blue type are listed in Findings and Recommendations)

Engines are equipped with Air-Sep systems.  
The air inlet piping and hoses appear satisfactory.  
Turbo's look good on both engines.  
Turbo on starboard engine leaking some oil.  
Blowers are quiet with no leaks.  
Emergency stop cables do not operate shutdowns on blowers both engines.  
Risers are dry stainless steel.  
There are no visible exhaust leaks.  
Both aluminum mufflers showing excessive corrosion.  
Port exhaust hose clamp broken.

## **Cooling System Main Engines**

Sea cock for Port engine will not close.  
All raw water hoses are old and need replacement.  
There are no sea strainers.  
Raw water pumps both engines look good with no observed leakage.  
Heat exchanger cores look clean and zincs in good condition.  
All of the engine coolant hoses that are not silicone should be replaced  
The engine coolant pumps look good with no apparent coolant or oil leakage.  
Thermostat housing on port engine leaking.

## **Lube Oil System Main Engines**

Oil filters are remote mounted spin on units with NAPA 1970 elements.  
There is an oil change pump for main engines and generators.  
No apparent seal leakage from crankshaft seals.

## **Fuel System Main Engines**

The primary filters are Racor dual units with 2020 elements.  
They are not equipped with fire shields on the bowls.  
There was sediment in the bowls.  
The secondary filters are engine mounted canister type.  
The majority of the fuel hoses on the engines are hard and brittle.  
There is a fuel priming pump for the main engines.  
The engine mounted fuel pumps have no apparent leaks.  
The fuel return cooler on the port engine has mounting clamps missing.  
There are no visible fuel leaks.

## **Electrical and General**

The Alarm system is inoperative.  
The Starters are 32 volt.  
The alternators are 32 volt.  
The batteries are 8 volt banks for 32 volts and all batteries appear new.  
Hydraulic hoses for bow thruster pump are old.  
Engine tachometers are disconnected.

## **Transmissions**

Manufacturer: Twin Disc  
Model: MG-5111-V  
Serial: Port: 5AR424

Associated Marine Surveyors 70' Hatteras "XXXXXX" #121804

Stbd: 5AN709

Ratio: 1.923:1

Engine mounted coolers leaking raw water and missing bolts.

Sending unit wires missing starboard gear.

Gears operate smoothly with the exception of the port when maneuvering initially clutch slipped but by the time clutch pressure was checked it was normal in both forward and reverse.

No apparent leakage from gear seals.

## **FINDINGS AND RECOMMENDATIONS** (Red type requires immediate attention)

### **Port Main Engine**

1. **Sea cock for Port engine will not close.**  
Repair or replace as required.
2. The majority of the fuel hoses on the engines are hard and brittle  
Replace.
3. Emergency stop cables do not operate shutdowns on blowers both engines.  
Determine cause and repair or relocate.
4. Aluminum mufflers showing excessive corrosion.  
Remove and repair or replace
5. Port exhaust hose clamp broken.  
Replace and check all exhaust clamp condition.
6. All raw water hoses are old and need replacement.  
Examine and replace as required.
7. Thermostat housing leaking.  
Repair as necessary.
8. The fuel return cooler on the port engine has mounting clamps missing.  
Replace missing clamps.
9. Evidence of rubber from engine coupling in bilge.  
Remove cover and inspect for source of rubber dust and repair as necessary.

### **Port Gear**

1. Sending unit has no wires connected to it.

### **Starboard Main Engine**

1. The majority of the fuel hoses on the engines are hard and brittle.  
Replace.
2. Emergency stop cables do not operate shutdowns on blowers both engines.  
Determine cause and repair or relocate.
3. Aluminum mufflers showing excessive corrosion.  
Remove and repair or replace
4. All raw water hoses are old and need replacement.  
Examine and replace as required.
5. Throttle linkage to governor sloppy.  
Repair loose linkage.

### **Port Generator**

1. Fuel leakage in vicinity of fuel injection pump.  
Locate and repair.
2. Sound enclosure in poor condition.  
Repair or replace sound enclosure.
3. Clean generator electrical end and take megger readings to determine condition of insulation.

### **Starboard Generator**

1. Sound enclosure in poor condition.

- Repair or replace sound enclosure.
2. Engine will not start and run reliably.  
Determine cause and repair.
3. Clean generator electrical end and take megger readings to determine condition of insulation.

## Electrical and General

1. **Alarm System is inoperative.**  
**Repair or replace.**
3. Engine tachometers are disconnected.  
Connect and prove functional.

## SUMMARY

### Port Generator

Compression and other readings are normal and it operates well under the available load.

### Starboard Generator

Compression readings are normal with the exception of #2 cylinder. The fuel system won't retain a prime reportedly due to lack of a check valve. The unit was started and ran for a moment. No readings or observations were recorded. Engine and systems need work.

### Port Main Engine

Compression readings are low and uneven. Crankcase pressure was within limits. No load engine speed was above what it should be. Full load engine speed was below what it should be. Coolant temperature at full load would not stabilize and was in excess of 190 and rising. Excessive grey smoke at full load. Heat exchanger core is clean. As a result of these observations it is expected remaining engine life is limited and engines are in need of overhaul in the near term. There is concern over the condition of the coupling.

### Starboard Main Engine

Compression readings are low and uneven. Crankcase pressure was within limits. No load engine speed was above what it should be. Full load engine speed was below what it should be. Coolant temperature at full load would not stabilize and was in excess of 190 and rising. Heat exchanger core is clean. As a result of these observations it is expected remaining engine life is limited and engines are in need of overhaul in near term.

### Port Reverse/reduction Gear

Clutch pressure is to specifications in forward and reverse. Oil temperature is normal. Port gear slipped in reverse during initial maneuvering but pressure readings weren't observed at that time.

### Starboard Reverse/reduction Gear

Clutch pressure is to specifications in forward and reverse. Oil temperature is normal. No slippage was observed.

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ATTENDING SURVEYOR \_\_\_\_\_

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