



**1999 136' Intermarine Motor Yacht**

**"Fortitude"**



# Condition & Value Report of Marine Survey

*Of the Vessel*

## "Fortitude"

**1999 136' Intermarine Motor Yacht**

**Conducted By**

Justin Grubb, IAMCS # 22CSF896 / YIII Marine Engineer

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**Prepared For**

Richard G Zahn Sr

**Date Of Survey:** 09/04-05-18/24

**Report Submitted On:** 09/18/24

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## INTRODUCTION

### PURPOSE & SCOPE

The attending Surveyor attended aboard the 1999 Intermarine Motor Yacht Fortitude, at the request of Richard G Zahn Sr , beginning 09/04-05-18/24

. The Survey was requested to determine the physical condition of the vessel. No reference or information should be construed to indicate evaluation of the internal condition of engines, transmissions, drives or generators, nor the propulsion system's or the auxiliary power system's operating capacities. Electrical and electronic equipment was powered up and some electrical equipment may have been tested for basic and/or limited function only. The wiring was inspected where accessible and was found to be in generally serviceable condition, unless otherwise noted. A significant amount of wiring could not be observed due to the wiring looms and conduits that transit areas which would require dismantling and removals for their inspection. If a detailed report as to the condition and capacities of the wiring and electrical components is desired, it is recommended that a qualified ABYC Certified Marine Electrical Engineer be engaged. Vessel tankage was visually inspected where accessible. No obvious leakage was observed, unless otherwise noted; however, the tanks were not confirmed to be full at the time of inspection. If a more thorough assessment is desired, the tanks should be filled and checked under full tank status or pressure tested to attest to their condition.

The vessel was Surveyed without the removal of any parts, including fixed partitions, fastened panels, fittings, headliners & wall-liners, heavy furniture, tacked carpeting or other fixed flooring material, appliances, electrical equipment or electronics, instruments, anchors line & chain, spare parts, personal gear, clothing, miscellaneous items in the bilges, cabinets, lockers or other storage spaces, or other fixed or semi-fixed items. Only installed items were inspected, including but not limited to enclosures, covers and tops. Locked compartments or otherwise inaccessible areas would also preclude inspection. Survey requester is advised to open up all such areas for further inspection. A visual inspection was conducted only on accessible structures and no destructive testing was performed. Naval architecture and engineering analysis were not a part of this Survey. Furthermore, no determination of stability characteristics or inherent structural integrity has been made, and no opinion is expressed with respect thereto. Complete compliance with, identification of, and reporting on all standards, codes and regulations is not guaranteed. This signed report represents the findings of the Survey and supersedes any and all conversations, statements and representations, whether verbal or in writing. This Survey Report represents the condition of the vessel on the above date or dates and is the unbiased opinion of the undersigned, but it is not to be considered an inventory, warranty or guarantee, either specified or implied. The Survey Report is for the exclusive use of the client and those lenders and underwriters that will finance and insure the vessel for this client only, and is not assignable to any other parties for any purpose. The survey was performed for vessel condition and valuation purposes only and should not be considered to be a full comprehensive pre-purchase type survey.

### CONDUCT OF SURVEY

THE MANDATORY STANDARDS PROMULGATED BY THE UNITED STATES COAST GUARD (USCG), UNDER THE AUTHORITY OF TITLE 46 UNITED STATES CODE (USC); TITLE 33 AND TITLE 46 CODE OF FEDERAL REGULATIONS (CFR), AND THE VOLUNTARY STANDARDS AND RECOMMENDED PRACTICES DEVELOPED BY THE AMERICAN BOAT AND YACHT COUNCIL (ABYC) AND THE NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) HAVE BEEN USED AS GUIDELINES IN THE CONDUCT OF THIS SURVEY.

### DEFINITION OF TERMS

The terms and words used in this report have the following meanings as used in this Report of Survey:

#### APPEARED:

Indicates that a very close inspection of the related item was not possible due to constraints imposed upon the Surveyor (e.g. no power available, inability to remove panels or requirements not to conduct destructive testing, etc.).

#### SERVICEABLE:

Fulfilling its function adequately (usable at the time of Survey).

#### POWERED UP:

Power was applied only. This does not refer to the operation of any system or component, unless specifically indicated.

#### USE OF "A", "B" or "C":

Use of the letters "A", "B" or "C" in the body of this report will indicate that a finding will be listed in the "Findings and Recommendations" Section pertaining to the lettered item. PLEASE BE ADVISED THAT SOME DEFICIENCIES, OBSERVATIONS AND SUGGESTIONS MAY ALSO BE CONTAINED IN THE BODY OF THE REPORT.

The number of asterisks in this General Information section refers to the source of related information as follows:

\*\* Per Manufacturer's Documentation

\*\*\* Per Registration Documentation

\*\*\*\* Per BUC Book Data

Unless specifically noted otherwise, there were no measurements or calculations performed during the Survey. The specifications listed within the report are believed to be correct; however, accuracy is not guaranteed. Recommend obtaining accurate measurements and performing calculations as desired, or verifying all vessel specifications and capacities with the vessel's builder.

### ***SURVEYOR NOTES***

#### REPORTED VESSEL DISCLOSURE COMMENTS

The surveyor was not made aware of any prior damage or insurance claim disclosures on the vessel.

#### HIN (HULL IDENTIFICATION NUMBER) VERIFICATION COMMENTS

The vessel's HIN (Hull Identification Number) was verified during the Survey inspection.

#### OUT OF WATER INSPECTION COMMENTS

A Diver's inspection was performed by Fathom Dive Services. Questions about the condition of the hull and underwater running gear & hull components should be directed to that diver.

#### TRIAL RUN COMMENTS

A trial run was not performed during the survey inspection.

#### ENGINE/MECHANICAL SURVEY

There was no mechanical/engine surveyor onboard during the survey. It is highly recommended and understood that all propulsion & auxiliary power systems (engines, transmissions, gears, drives, generators) be inspected by their respective manufacturer's certified technician to determine their condition.

#### ELECTRICAL INSPECTION COMMENTS

AC and DC power was used to power up the electrical systems specified in this report only, unless otherwise noted.

#### GENERAL RECOMMENDATIONS

Recommend implementing/maintaining vessel trip and machinery maintenance log books.

**GENERAL VESSEL INFORMATION**

TYPE OF SURVEY REQUESTED	Pre-Purchase for Buyer
DATE AND TIME OF SURVEY	09/04/24 @ 08:00 09/05/24 @ 08:00 09/18/24@ 09:00
FILE NUMBER	091824
VESSEL TYPE	Motor Yacht
VESSEL BUILDER	Intermarine, USA.
VESSEL DESIGNER	Setzer/Paragon Design
VESSEL INTERIOR DESIGNER	Marc Michaels
HIN (HULL IDENTIFICATION NUMBER)	VBF13601A999
VESSEL CLASSIFICATION/STANDARD	Rina Certificate of Class "C ?Hull? Mach Y CH:unrestricted".
MODEL YEAR	1999 (per Builder's Certificate)
DATE KEEL LAID	***February 11th 1997
YEAR BUILT	1999 (per Hull Identification Number)
HULL NUMBER	01 (per Hull Identification Number)
DOCUMENTED HAILING PORT	George Town, Cayman Islands
HAILING PORT DISPLAYED	George Town, CI
HOME PORT	Hillsboro Beach, FL
OFFICIAL NUMBER	*** 750828
I.M.O NUMBER	8653310
VESSEL MATERIAL	FRP (fiber-reinforced plastics)
LENGTH OVERALL (LOA)	**Reportedly, approximately 136'
REGISTERED LENGTH	*** 136'
BEAM	*** reportedly, 27'11"
DRAFT	**** 5'81"
DISPLACEMENT	**398,000 lbs. (Approximate gross weight)
GROSS TONNAGE	*** 398,000lbs
NET TONNAGE	*** 119,000Lbs
LOCATION OF SURVEY INSPECTION	957 Hillsboro Mile Hillsboro Beach, FL
VESSEL OWNER	Fortitude Charter, LLC
VESSEL OWNER ADDRESS	919 North Market Street Suite 950 Wilmington , DE 19801 USA
WEATHER CONDITIONS PRESENT	Rainy.

**RATING & VALUATION**

VESSEL OVERALL RATING  
\*\*\*\*AVERAGE

## CONDITION & VALUE REPORT OF MARINE SURVEY

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### ESTIMATED MARKET VALUE

7,500,000

### ESTIMATED REPLACEMENT COST

28,700,000

## VESSEL CONSTRUCTION

### HULL ARRANGEMENT

#### VESSEL DESCRIPTION AND LAYOUT

A descriptive narrative as to the layout of this vessel will not be covered in this report since it is assumed that the prospective purchaser of this vessel has inspected or been informed by the broker, agent, listing or representative about the vessel's layout.

#### HULL DESIGN TYPE

Semi-Displacement, with broken sheer-line, flared bow, hard chines, spray-rails and partial keel.

#### HULL MATERIAL

FRP (fiber-reinforced plastic).

#### EXTERIOR FINISH

Matterhorn White Awlgrip paint, with Black Awlgrip painted boot stripe.

#### GENERAL EXTERIOR CONDITION

The exterior of the vessel appeared to be generally well kept with no significant wear & tear observed, except where noted.

#### FINDING C-1

#### SWIM PLATFORM

Cored fiberglass swim platform.

#### BOARDING SWIM LADDER

None sighted.

#### BULKHEADS

Athwartships reinforcement was reportedly provided by composite cored bulkheads, bonded/tabbed to the hull with FRP (fiber-reinforced plastic). A complete inspection was not possible due to limited access.

#### STRINGERS/TRANSVERSALS

Hull stiffness was reportedly provided by cored fiberglass longitudinal stringers and athwartships transversals. A complete inspection was not possible due to limited access.

#### STEM

Raked stem.

#### KEEL

Partial keel molded into the hull's layup schedule.

#### BILGES

A coated surface was used in the bilges. Recommend keeping the bilges clean & dry.

#### FINDING C-2

#### GENERAL BILGE CONDITION

Some of the bilge spaces required general cleaning/detailing and some of the bilges were due for paint refinishing.

#### FINDING C-3

#### CHAIN LOCKER DRAINAGE

Overboard, port & starboard at the lower bow.

#### BILGE LIMBER HOLES

The limber holes appeared to be appropriately sized and clear where sighted.



### VESSEL LIST

The vessel did not have any significant listing, during the survey (a nearly straight waterline was observed).

### MOISTURE COMMENTS

There did not appear to be any significantly elevated conductivity readings (possible moisture intrusion or other conductive material) around the hull and deck penetrations, when tested with a FM Wave type moisture meter (some slightly elevated conductivity readings were observed).

### CONSIDERATIONS

Limited Electronic Moisture Testing was performed only on the vessel's surfaces above the sheer-line. Boat builders utilize various construction materials, fasteners, coatings, fairings and composites, many of which have been proven to trigger higher conductivity readings and false positive readings for moisture on Moisture Meters. It must be understood that Moisture Meters are designed to detect the "conductivity" of substrates; including moisture, among various other conductive materials, and their ability to detect conductivity can be limited by many factors, such as the depth of the conductive material, air space present in between the laminate and the conductive material, etc. If a more thorough assessment of possible moisture content in the vessel's laminates is desired, it is recommended that a non-destructive Thermal Imaging Survey be performed to the "Infraspection Institute's Standards for the Inspection of Recreational Yachts & Small Craft Constructed of Fiberglass Reinforced Plastic and Composite Materials". Destructive testing may also be considered if a more definitive conclusion regarding possible moisture content is desired.

## **DECK ARRANGEMENT**

### DECK MATERIAL

Reportedly, cored FRP (fiber-reinforced plastic) with teak decking overlays.

### DECKING OVERLAY

Teak decking overlays throughout the vessel's exterior.

#### **FINDING C-4**

### BULWARKS

Molded fiberglass bulwarks (part of the deck's layout) with varnished teak cap-rails.

### RUB-RAILS

Stainless steel rub rails.

#### **FINDING C-5**

### HULL-TO-DECK JOINT TYPE

Fiberglass "welded" joint.

### HULL-TO-DECK JOINT FASTENERS

Stainless steel.

### HULL-TO-DECK JOINT REINFORCEMENT

The hull-to-deck joint was reportedly fiberglass tabbed internally.

### HULL-TO-DECK JOINT BEDDING COMPOUND

Reportedly, elastomeric polyurethane compound.

## **SUPERSTRUCTURE ARRANGEMENT**

### SUPERSTRUCTURE MATERIAL

Sandwich cored FRP (fibre-reinforced plastic).

### SUPERSTRUCTURE-TO-DECK JOINT TYPE

The superstructure and deck were molded seamlessly with no joint.

## **BRIDGE ARRANGEMENT**

### **BRIDGE MATERIAL**

Cored FRP (fiber-reinforced plastic).

### **BRIDGE TYPE**

The bridge provided the helm station and crew seating area.

### **RADAR ARCH**

Fiberglass radar arch.

**FINDING C-6**

## **EXTERIOR EQUIPMENT**

### **SUNDECK EQUIPMENT**

The sundeck included a wet-bar sink, refrigerator, ice maker and a electric grill. Powered up.

### **COCKPIT/AFT DECK EQUIPMENT**

The bridge deck aft had a drinks fridge and wet-bar sink.

### **GENERAL EXTERIOR SOFT-GOODS CONDITION**

The vessel's exterior soft-goods appeared serviceable with no significant wear/weathering.

### **EXTERIOR BRIGHT WORK**

No significant weathering was observed on the vessel's exterior bright work varnish.

### **GENERAL HARDWARE CONDITION**

Some of the vessel's hardware has developed common corrosion, rust, green verdigris corrosion or coating blistering.

**FINDING C-7**

### **GENERAL CAULKING/SEALANT CONDITION**

General weathering has developed on some of the vessel's exterior caulking sealants, including the window seals.

**FINDING C-8**

### **EXTERIOR LIGHTING**

All lights illuminated.

### **EXTERIOR WASHDOWNS**

Freshwater washdowns were located at convenient locations throughout the vessel. Demonstrated.

### **HOT TUB/JACUZZI**

Hot tub with immersion heater on the sundeck. Demonstrated.

### **CABIN VENTILATION**

Provided by portholes and main companionway doors.

### **DECK HATCHES**

One (1) Bomar hatch was located on the foredeck.

### **PORTHOLES/PORTLIGHTS**

Fixed and opening portholes were located on the hull sides.

### **EXTERIOR DOORS**

Recommend confirming that the lock-set keys are onboard and operational upon conveyance.

## CONDITION & VALUE REPORT OF MARINE SURVEY

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### WINDOWS

Tinted & tempered fixed windows.

### WINDSHIELD

Tempered glass pilothouse type windows.

**FINDING C-9**

**FINDING C-10**

### SPRAY-SHIELD

Tinted flybridge spray-shield. NOTE: some general UV/heat crazing has developed on the flybridge spray-shield.

**FINDING C-11**

### DECK RAILINGS

Stainless steel railings ran from amidships around the forward perimeter of the vessel.

### HAND RAILS/GRAB RAILS

Stainless steel handrails were located at convenient locations of the vessel. All were found to be secure.

**FINDING C-12**

### BOARDING STAIRS/BOARDING LADDER

MarQuipt removable side boarding ladder.

### BOARDING PASSERELLE

MarQuipt passerelle.

**FINDING B-1**

### DAVIT/CRANE

MarQuipt 5,000 lb. capacity electro-hydraulic gantry cranes.

**FINDING C-13**

### DECK DRAINAGE

Self bailing deck drains were observed at appropriate locations throughout the vessel.

### CLEATS

Cleats throughout the vessel were stainless steel horn type.

### LINE CHOCKS

Stainless steel line fairleads.

### LINE HAWSE PIPES

Line hawse pipes were installed port & starboard at the stern, fore & aft side decks and at the bow.

### LINE WARPING CAPSTANS

Two (2) Maxwell Line Warping Capstan Winches for handling the stern lines.

**FINDING C-14**

### ANCHOR PLATFORM

Stainless steel fairlead anchor roller chute.

### EXTERIOR STORAGE

Various exterior lockers and storage areas appeared serviceable, except where noted.

**FINDING A-1**

**FINDING C-15**

## CONDITION & VALUE REPORT OF MARINE SURVEY

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### EXTERIOR COVERS

Stamoid type vinyl covers.

### SUN SHADES

Textilene vinyl mesh windshield shade.

### FENDERS

Various fenders were observed onboard (amount included unknown).

### MOORING LINES

Dock/mooring lines were observed onboard and at the vessel's mooring (amount included unknown).

### COMMENTS

The port side aft deck hydraulic door did not fully close when tested ( possibly due to a worn hydraulic block).

**FINDING B-2**

## TENDER / AUXILIARY WATERCRAFT

### TENDER/WATERCRAFT

AB Inflatables, rigid fiberglass bottom inflatable RIB.

### MODEL YEAR

2015 (per Hull Identification Number).

### HIN (HULL IDENTIFICATION NUMBER)

XMO48010A515

### ENGINE MODEL

Yamaha 90 HP Four Stroke Outboard.

### ENGINE SERIAL NUMBER

61PL1074174 (tender)  
CA-YDV39080L122 (pwc)  
CA-YDV39071L122 (pwc)

### TENDER COMMENTS

The tender was not inspected as it was on a boat lift with a cover on.

### OTHER WATERCRAFT

Two (2) SeaDoo GTI SE Personal Watercraft. Briefly powered up.

### COMMENTS

Recommend inspection by a Qualified Inflatable Service Facility, as necessary.

## CABIN APPOINTMENTS

### *INTERIOR*

### SALON ARRANGEMENT

Salon sofas port & starboard with forward dining salon area.

### INTERIOR BAR

The sundeck includes a wet-bar sink, refrigerator and ice machine.

### MAIN CABIN ARRANGEMENT

On Deck master stateroom with ensuite head, lower forward VIP stateroom with ensuite head, port and starboard twins with ensuite heads and forward crew cabins with ensuite heads and a port forward twin bunk cabin with ensuite head.

### GALLEY ARRANGEMENT

Port forward amidships.

### DINING ARRANGEMENT

A dining set was arranged in the port forward salon.

### ACCOMMODATION ARRANGEMENT

On Deck master stateroom with ensuite head, lower forward VIP stateroom with ensuite head, port and starboard twins with ensuite heads and forward crew cabins with ensuite heads and a port forward twin bunk cabin with ensuite head.

### HEAD ARRANGEMENT

Vacuflush 24 volt heads.

### SHOWER ARRANGEMENT

Stall type showers in the stateroom heads.

### BATHTUB ARRANGEMENT

One (1) jetted tub in the master head. Required test prove.

### INTERIOR CABINETS & TRIM

The interior cabinetry and trim appeared serviceable, except where noted.

#### FINDING C-16

### INTERIOR STORAGE

The interior storage areas appeared serviceable, except where noted.

#### FINDING C-17

### CEILING HEADLINERS

Headliner material was textured vinyl.

#### FINDING C-18

### WALL-LINERS

Wall-liner material was padded simulated leather.

### WINDOW TREATMENTS

Electrically operated window shades in the salon.

### FLOORING

Carpeting in the salon and cabins.

### CABIN SOLE FOUNDATION

Plywood cabin sole foundation.

### COUNTER TOPS

No significant wear was noted on the counter tops.

### INTERIOR MIRRORS

No de-silvering was observed on the interior mirror's reflective coatings.

### GENERAL INTERIOR & SOFTGOODS CONDITION

The general maintenance of the vessel's interior appeared serviceable.

### GENERAL INTERIOR FURNISHINGS & SOFT-GOODS CONDITION

The general maintenance of the interior soft-goods appeared serviceable.

#### INTERIOR JOINER WORK COMMENTS

The interior joiner work appeared serviceable, except where noted.

**FINDING C-19**

#### INTERIOR BULKHEADS

The interior bulkheads appeared serviceable, where sighted.

#### WATER INTRUSION COMMENTS

Some exceptions were observed (see Findings Appendix).

**FINDING C-20**

#### INTERIOR ODOR COMMENTS

No significant interior odor was observed at the time of survey.

### ***INTERIOR SYSTEMS & EQUIPMENT***

#### LIGHTING

12 volt DC and 110 volt AC lighting fixtures.

#### HVAC/AIR CONDITIONING SYSTEM

Aqua Air tempered water loop air conditioning system model #A30P212V1HGDN, serial #H350531. The system is rated at 360,000 Btu and charged with R407C.

(2) Frenic Mega variable frequency drives for chillers

(2) AC electric seawater pumps with Automation Direct 3-hp VFDs

Control cabinet and Aqua Air touchscreen controller

AC electric chilled water circulating pump.

(2) Copeland 15-ton scroll type compressors

Amtrol chilled water accumulator tank, fill valve, and pressure gauges

**FINDING B-3**

**FINDING C-21**

#### CABIN HEATING SYSTEM

The marine air units were reverse cycle for heat (required test/prove).

#### HEAD EXHAUST VENTILATION FANS

Exhaust fans were installed in the heads.

#### LAUNDRY SYSTEMS

Bosch dryer and Whirlpool washer in the crew mess laundry. Miele washer and Bosch dryer in the guest area laundry. Powered up.

#### COMMENTS

Loose equipment and personal items were observed at various areas of the vessel, which hindered inspection. Recommend removing the items and further inspecting as necessary.

### ***AUDIO/VISUAL EQUIPMENT***

#### TELEVISION SYSTEM

All cabins had televisions with DirecTV.

#### STEREO SYSTEM

Bose Lifestyle home entertainment system, with surround sound speaker system.

Yamaha audio video receiver RX-A880, Crestron CNX-PAD8A audio processor, Crestron CP3N control processor.

Yamaha audio video receiver RX-880, Memphis audio EOL7 with Bose surround system.

Mid Atlantic power rack distribution strip, Yamaha audio video receiver RX-A880, Crestron CNX-PAD8A audio processor, Crestron CP3N control processor.

The audio components powered up but required a full test/prove for all functionality

### SATELLITE TELEVISION SYSTEM

KVH HD11 digital satellite TV antenna.

### SATELLITE INTERNET SYSTEM

New Starlink system, undergoing installation. Required test/prove.

### ONBOARD WIFI SYSTEM

The vessel was projecting a wireless network "Fortitude", but required test/prove. Recommend obtaining the vessel wireless router's SSID password and WAP login.

### COMMENTS

Today's modern entertainment equipment can have hundreds of different functions and settings, most of which are beyond the scope of this survey. If a detailed report as to the operating capacity of the vessel's entertainment equipment is desired, it is recommended that a marine entertainment systems expert be engaged.

## ***GALLEY EQUIPMENT***

### REFRIGERATION

Dual Liebherr fridge with freezer drawers

### ICE MAKER

Manitowoc ice maker.  
GE ice maker.  
Whirlpool ice maker.  
Kitchen Aid ice maker.

### OVEN

KitchenAid dual electric oven.

#### **FINDING B-4**

### STOVE

Frigidaire 5-burner induction glass top range. Powered up.

### EXHAUST HOOD

Stainless steel range hood with dual variable speed fan, light, and fire suppression system. Powered up.

### MICROWAVE OVEN

Midea microwave oven. Powered up.  
Galanz microwave oven. Powered up.

### DISHWASHER

GE Monogram dishwasher. Powered up.

### GALLEY SINK

Stainless steel under-mount sink with dual wash basins.

### GARBAGE DISPOSAL

Insinkerator garbage disposal.

### GALLEY ACCESSORIES

Various countertop appliances.

### CREW GALLEY EQUIPMENT

The crew galley was equipped with a Avanti Refrigerator, KitchenAid bin type ice machine, Galanz microwave oven and Various countertop appliances. Powered up.

## PROPULSION & MACHINERY SPACE

### *PROPULSION SYSTEM*

#### ENGINE MODEL

Twin, MTU 12V396 Series. Twin Turbocharged & Intercooled.

#### MANUFACTURE DATE

Data tags stated 1996.

#### ENGINE HORSEPOWER

Data tags stated 2,252 horsepower each @ 2,000 RPM.

#### NUMBER OF CYLINDERS

Twelve (12) in a V configuration.

#### ENGINE STARTER VOLTAGE RATING

24 volt.

#### ENGINE HOURS

Port: 15, 423 Starboard: 15, 428 hours observed on the digital hour meters.

#### ENGINE SERIAL NUMBERS

Port: 5583118 Starboard: 5583117

#### ENGINE DISPLAYS

MTU engine systems monitoring displays.

**FINDING B-5**

#### ENGINE INSTRUMENTATION

Main engine instrument gauges were installed at the helms.

#### ENGINE ALARM SYSTEM

Audible/visual engine alarms at the helms.

#### ENGINE EXHAUST SYSTEM

Raw water cooled with hard-coat insulated stainless steel exhaust mixing risers by "Marine Exhaust Systems Inc.", and flexible connection silicone hoses to fiberglass surge pipes & mufflers, exiting through transom mounted discharges.

**FINDING B-6**

#### ENGINE COOLING SYSTEM TYPE

Raw water cooled plate core type engine cooling, with raw water cooled exhaust.

#### ENGINE DRIVE BELTS

See engine survey.

#### THROTTLE & SHIFT CONTROLS

MTU Electronic Throttle & Gear Controls, with Emergency Manual Backup Controls.

#### EMERGENCY ENGINE SHUT-DOWN

See engine survey.

#### ENGINE BED MOTOR MOUNTS

Adjustable motor mounts on cored fiberglass longitudinal engine bed stringers.

#### ENGINE BED SUMPS

Integrated drip sumps under the engines.



## CONDITION & VALUE REPORT OF MARINE SURVEY

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### MAIN ENGINE OIL LEVEL

See engine survey.

### MAIN ENGINE COOLANT LEVEL

See engine survey.

### ENGINE BLOCK HEATERS

The engine block heaters did not power up when tested.

#### FINDING B-7

### ENGINE NOTES

At the time of survey the port main engine's intercooler and turbos were removed and being cleaned/repared. Once repairs are made and parts reinstalled, a sea trial would be recommended.

### COMMENTS

See engine survey.

## ***MACHINERY & BILGE SPACE EQUIPMENT***

### ENGINE SPACE VENTILATION

Natural air flow ventilation was provided by the hull side vents.

### ENGINE ROOM AIR BLOWERS

Delta "T" Systems 115 volt blowers were located in the outboard engine room with two (2) Yaskawa Variable Frequency Drives. Powered up.

### SEACOCKS/SEA-VALVES

Raw water seacocks were bronze alloy butterfly valve type. Lubricate, exercise and monitor frequently. Recommend performing maintenance on all seacocks & sea-strainers annually (disassemble, inspect, clean and lubricate). It is also recommended that all below the waterline and near the waterline thru-hulls have a proper sized wooden plug attached to function as an emergency plugging device.

#### FINDING B-8

### RAW WATER STRAINERS

Underwater strainer screens.

### HOSES

Appeared serviceable, where sighted. Monitor frequently for dry cracking, degradation, damage or chafing.

### HOSE CLAMPS

Appeared serviceable where sighted. Recommend installing corrosion resistant marine grade stainless steel T-bolt type hose clamps and/or solid banded (non-open slotted) hose clamps where appropriate.

### LUBE OIL TANKAGE

Reportedly, 150 gallon Clean Lube Oil Tank and 163 gallon dirty oil tank.

### SHIP'S AIR COMPRESSOR

AC belt driven air compressor.

### MACHINERY SPACE WATER SUPPLY

A freshwater hose connection was located in the aft engine room.

### MACHINERY SPACE INSULATION

Thermal & acoustical sound deadening insulation was reportedly built into the engine room.

#### FINDING B-9

**TOOL BOX**

Two (2) Craftsman tool boxes installed in the engine room.

**COMMENTS**

See findings.

***TRANSMISSIONS / GEARS / DRIVES***

**DRIVE SYSTEM TYPE**

Direct Drive.

**TRANSMISSIONS/GEARS**

ZF Friedrichshafen.

**GEAR RATIO**

Data tags stated, 2,025 : 1A ratio.

**GEAR SERIAL NUMBERS**

Port: 1568 Starboard: 1567

**GEAR CONTROLS**

MTU Elektronik Controls.

**TRANSMISSION INSTRUMENTATION**

Transmission gauges were integrated into the main engine instrumentation displays.

**GEAR COOLERS/HEAT EXCHANGERS**

Raw water heat exchangers. Check zinc anodes or bonding often.

**GEAR FLUID LEVEL**

See engine survey.

**PROPELLER SHAFTS**

Size: 4 1/2". Material: Stainless Steel.

**PROPELLER SHAFT COUPLERS**

Safety wiring was installed on both shaft couplers.

**PROPELLER SHAFT SEALS**

Dripless Shaft Seal Systems. Monitor frequently.

**FUEL SYSTEMS**

**FUEL SYSTEM TYPE**

Diesel.

**FUEL TANK MATERIAL**

Integral fiberglass and aluminum.

**NUMBER OF FUEL TANKS**

Eight (8)

**FUEL TANKAGE CAPACITY**

Reportedly, 11,514 gallons (per builder). Recommend verifying the fuel tankage capacity.

**FUEL LEVEL MONITORING**

Fuel level gauges integrated into the monitoring system.

## CONDITION & VALUE REPORT OF MARINE SURVEY

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### FUEL TANK MANUFACTURER LABELING

None sighted.

### FUEL TANKAGE SECURING

Bonded/glassed to the hull as well as framed in and glassed to the stringer system.

### FUEL TANKAGE LOCATION

Port and starboard forward and mid, center, engine room forward day tank. Two aft tanks one made out of frp and one aluminum.

### FUEL FILL LOCATION

Port & starboard aft side decks, marked for diesel.

### FUEL FILL MARKING

The fuel fill fittings were marked "fuel".

### FUEL TANK VENTILATION

All tanks vent into a 31 gallon vent box with a high level switch. The vent box leads up to the mast.

### FUEL TANKAGE & FUEL FILL GROUNDING

Unknown due to access. Recommend verifying grounding.

### FUEL FILL HOSE/PIPE

Steel pipe.

### FUEL LINES/HOSES

Stainless steel fuel lines, with flexible hose to engine connections.

### FUEL SHUT-OFF VALVES

Screw down non return valves at the fuel manifold.

### FUEL MANIFOLD VALVES

Screw down non return valves.

### MAIN ENGINE PRIMARY FUEL FILTERS

Three (3) Racor primary fuel filter/water separators.

### MAIN ENGINE SECONDARY FUEL FILTERS

MTU engine mounted secondary fuel filters.

### GENERATOR PRIMARY FUEL FILTERS

Racor primary fuel filter/water separators.

### GENERATOR SECONDARY FUEL FILTERS

Engine mounted spin-on canister type secondary fuel filter.

### FUEL FILTER CONDITION

Unknown, due to enclosed filter design type. Monitor/service often.

### GENERATOR FUEL FILTER CONDITION

Unknown, due to enclosed filter design type. Monitor & service often.

### FUEL COOLERS/HEAT EXCHANGERS

Engine mounted heat exchangers/coolers.

### FUEL TRANSFER SYSTEM

AC and DC Fuel Transfer Pumps. Powered up.

### FUEL PRIMING SYSTEM

Manual fuel priming at the engine's secondary fuel filters.

FUEL FLOW RATE SYSTEM

MTU engine management system included fuel flow rate data.

FUEL POLISHING SYSTEM

Alfa Laval Fuel Polisher. Powered up.

**ELECTRICAL SYSTEMS**

***DC ELECTRICAL SYSTEMS***

DC SYSTEMS VOLTAGE

24/12 volt systems.

BATTERIES

Two (2) 12 volt DC Lifeline GPL-8DA "Maintenance Free" batteries.

Twelve (12) 2 volt DC gel 420 AH Mastervolt "Maintenance Free" batteries.

Four (4) AGM Lifeline GPL-4DL "Maintenance Free" batteries.

BATTERY SWITCHES

Five (5) Coupe' Battery Switches.

BATTERY PARALLEL SWITCHING

Battery Parallel Switch installed in the engine room.

MAIN DC BREAKERS

The main DC breakers were installed in the engine room and the bridge.

DC ELECTRICAL PANEL BREAKERS/FUSES

DC branch breakers in the main electrical panel with various inline fuses.

DC ELECTRICAL SYSTEM MONITORS

Analog DC voltage & amperage gauges in the main pilothouse electric panel.

BATTERY CHARGERS

Mastervolt MASS - 24 volt / 50 amp. Battery Charger.

Two (2) Mastervolt MASS - 24 volt / 75 amp. Battery Charger.

BONDING SYSTEM (ABYC E-2 & E-11)

Recommend investigating and completing the vessel's bonding system, to help minimize electrolytic corrosion from stray current and enhance lightning protection. Recommend thorough inspection and maintenance of the vessel's bonding system, by checking the security of all bonding conductor terminations (destructive testing), cleaning any corrosion off of the bonding conductors and applying a corrosion inhibitor.

**FINDING B-10**

DC SYSTEM WIRING TYPE

Appeared to be well supported and secured where sighted. Always recommend installing chafe gear at all key friction points where wires/cables and hoses transit the vessel against sharp edges. Also recommend waterproofing all wiring connections that may be exposed to moisture.

DC ELECTRICAL/WIRING COMMENTS (ABYC E-11)

Appeared to be well supported and secured where sighted, except where noted. Always recommend installing chafe gear at all key friction points where wires/cables and hoses transit the vessel against sharp edges. Also recommend waterproofing all wiring connections that may be exposed to moisture.

COMMENTS

Always recommend verifying that the AC/DC electrical systems have properly sized and rated overcurrent circuit protection and conductor sizes.

## ***AC ELECTRICAL SYSTEMS***

### **AC SHORE POWER SYSTEM VOLTAGE**

120/208 volts @ 60Hz.

### **AC SHORE POWER PHASE RATING**

Three Phase.

### **AC SHORE POWER INLETS**

Two (2) 100 amp. 120/208 volt shore power inlets

### **AC SHORE POWER CORDS**

Two (2) 100 amp. vinyl shore power cords.

### **MAIN AC SHORE POWER BREAKERS**

The main AC breakers were installed in the main electrical panel.

### **AC ELECTRICAL PANEL BREAKERS**

AC branch breakers in the engine control room and throughout the vessel. Powered up.

### **AC ELECTRICAL SYSTEM MONITORS**

AC voltage & amperage gauges in the main AC electric panel.

### **AC ELECTRICAL SOURCE SELECTOR SWITCHING**

Manual rotary type selector switch for shore or ship power.

### **AC POWER ISOLATION TRANSFORMERS**

Atlas Marine Systems, Auto-Phase 100 Isolation Transformer.

### **AC POWER FREQUENCY CONVERTER**

Atlas Marine Systems, ShorPOWER frequency converter.

### **GALVANIC ISOLATION SYSTEM (ABYC A-28)**

Highly recommended, if not wired inside the Frequency Converter.

### **AC ELECTRICAL POWER OUTLETS**

The AC outlets were tested using a UL listed circuit tester. All GFCI protected outlets tripped at their test buttons, where sighted.

### **AC ELECTRICAL OUTLET POLARITY**

AC electrical outlet polarity was checked and found to be wired correctly.

### **AC SYSTEM WIRING TYPE**

Appeared serviceable for intended use where sighted.

### **FINDING B-11**

### **AC ELECTRICAL/WIRING COMMENTS (ABYC E-11)**

Recommend thorough inspection and maintenance of the vessel's AC & DC wiring, by checking the security of all electrical conductor terminations (destructive testing), cleaning any corrosion off of the electrical conductors and applying a corrosion inhibitor where appropriate.

### **COMMENTS**

Always recommend having an ABYC certified marine electrician inspect the vessel's electrical system.

## **GENERATORS/AUXILIARY POWER**

### ***GENERATORS***

**GENERATOR MODEL**

Northern Lights

**GENERATOR FUEL TYPE**

Diesel.

**NUMBER OF CYLINDERS**

Six (6).

**GENERATOR KILOWATT RATING**

80.0 KW.

**GENERATOR ENGINE RPM RATING**

1,800 RPM.

**GENERATOR VOLTAGE RATING**

120/208 volts @ 60 Hz.

**GENERATOR PHASE RATING**

Three Phase.

**GENERATOR STARTER VOLTAGE RATING**

24 volt.

**GENERATOR HOURS**

Port: 7734,5 Starboard: 7607,0 hours observed on the generator mounted hour meters.

**GENERATOR SERIAL NUMBERS**

Generator: Port: LM-306838-0697 Starboard: LM-306873-0697

Engine: Port: T06068T574352 Starboard: T06068T574353

**GENERATOR INSTRUMENTATION GAUGES**

Generator instrument panels installed at the generators.

**GENERATOR ALARM SYSTEM**

Generator audible alarms.

**GENERATOR DRIVE BELT**

See engine survey.

**GENERATOR LUBRICATION SYSTEM**

Engine mounted mechanical oil pumps with spin-on type filters.

**GENERATOR OIL LEVEL**

See engine survey.

**GENERATOR COOLING SYSTEM TYPE**

Closed coolant with raw water exhaust type. Change zinc anodes regularly.

**GENERATOR COOLANT LEVEL**

See engine survey.

**GENERATOR FUEL SYSTEM**

Engine mounted 24 volt electric pumps.

**GENERATOR EXHAUST SYSTEM**

Raw water cooled with fiberglass water-lift type mufflers.

**FINDING B-12**

**GENERATOR SPACE VENTILATION**

Natural air ventilation for the generator space was provided by the port & starboard hull side vents.

**GENERATOR ACCESSIBILITY**

Good.

**COMMENTS**

See engine survey.

**WATER SYSTEMS**

***FRESHWATER SYSTEM***

**WATER TANKAGE MATERIAL**

Integral fiberglass.

**NUMBER OF FRESHWATER TANKS**

Two (2).

**WATER TANKAGE CAPACITY**

Reportedly, 1,618 gallons (per builder).

**WATER TANKAGE SECURING**

The water tankage was bonded/glassed to the hull.

**WATER TANKAGE LOCATION**

Port and starboard centerline forward of the engine room bulkhead.

**WATER FILL LOCATION**

Port & starboard amidships, marked for water.

**WATER FILL MARKING**

Both fills were properly marked for water.

**FRESHWATER TANKAGE VENTILATION**

Port & starboard hull sides.

**FRESHWATER PUMPS**

Demand type Freshwater Pump.

**FRESHWATER FILTRATION**

Inline filters. Monitor & replace, as necessary.

**FRESHWATER ACCUMULATOR TANK**

Coated steel accumulator tank.

**FRESHWATER PIPE/HOSE PLUMBING**

Copper pipes and rubber hoses installed throughout the vessel.

**WATER LEVEL MONITORING**

Water gauge integrated into the vessels monitoring system.

**CONSIDERATIONS**

Recommend periodically sanitizing the vessel's water tankage and water delivery systems.

### ***HOT WATER SYSTEM***

#### WATER HEATER

Two (2) Rheem ELD52-FTB

#### WATER HEATER TYPE

208 volt AC electric.

#### WATER HEATER CAPACITY

50 gallons each.

#### WATER HEATER PRESSURE RELIEF VALVE

Relief valve at the tank.

#### CONSIDERATIONS

Recommend monitoring the water heater and maintaining or installing a magnesium anode inside the tank, as it is generally known that the tank can fail internally without warning.

### ***WATER FILTRATION SYSTEM***

#### DESALINATION (FRESHWATER MAKING) SYSTEM

Two (2) FCI Dolphin Series reverse osmosis watermakers rated at 1,200 gallons per day.

**FINDING B-13**

#### DESALINATION SYSTEM RATING

1,200 gallons per day (per data tag).

#### UV LIGHT

Sanitron Ultraviolet water disinfection light. Powered up.

#### CONSIDERATIONS

The desalination system was briefly demonstrated. Always recommend inspection by a qualified water maker service technician, as necessary.

### ***BLACKWATER SYSTEM***

#### MSD (MARINE SANITATION DEVICE) SYSTEM (33 CFR 159)

Type III MSD Waste System (utilizes a holding tank or similar device that prevents the overboard discharge of treated or untreated sewage).

#### BLACKWATER TANKAGE

Reportedly, 353 gallon capacity (per builder).

#### BLACKWATER TANKAGE VENTILATION

The Blackwater tank's vent fitting was plumbed to the arch and mast.

#### BLACKWATER SYSTEM DISCHARGE

Macerating type overboard discharge pump.

#### CONSIDERATIONS

The vessel's operator is responsible for determining what type of MSDs (marine sanitation devices) are prohibited & permitted by law in the location of the vessel's intended use.

### ***GREYWATER SYSTEM***

#### GREYWATER TANKAGE

Two (2) Aluminum tanks.



### GREYWATER DISCHARGE SYSTEM

AC voltage discharge pump. Powered up.

### HEAD SINKS

Porcelain "Vessel" type sinks were installed in the heads.

### GREYWATER SYSTEM COMMENTS

Recommend cleaning the greywater sump tanks periodically.

### CONSIDERATIONS

The vessel's operator is responsible for determining whether direct greywater overboard discharge is prohibited or permitted by law in the location of the vessel's intended use.

## STEERING SYSTEMS

### STEERING SYSTEM TYPE

Hydraulic power steering, with engine mounted PTOs (power take offs).

### STEERING SYSTEM MANUFACTURER

Jastram Engineering Ltd with Anschutz controls.

### NUMBER OF STEERING STATIONS

Three (3) main bridge helm station, port and starboard wing stations.

### STEERING HOSES/LINES

Reinforced flexible hoses with metallic fittings.

#### FINDING B-14

### STEERING SYSTEM ACTUATORS

The steering rams appeared to be well secured. No hydraulic fluid ram leaks were observed during the survey.

### UPPER RUDDER BEARINGS & RUDDER SUPPORT

Black nylon upper rudder bearings on cored fiberglass rudder tables.

### RUDDER STOCKS

Stainless steel rudder stocks.

### RUDDER LOG SEALS

No leaks were observed. Monitor frequently.

### RUDDER POSITION INDICATOR

Anschutz rudder angle gauge.

### EMERGENCY STEERING SYSTEM

Tiller integrated steering backup system.

### THRUSTERS

Electric bow thruster. Demonstrated.

### COMMENTS

The steering system components located in the aft bilge were not thoroughly inspected due to poor access.

## GROUND TACKLE

### ANCHORS

Two (2) Pool Anchors (specs were not know by crew).

**ANCHOR RODE TYPE**

19mm Galvanized stud link chain.

**ANCHOR WINDLASS**

Maxwell Windlass. Demonstrated.

**FINDING C-22**

**CONSIDERATIONS**

Highly recommend at least one additional spare anchor and rode for emergencies and added anchoring options.

**ELECTRONICS & NAVIGATION EQUIPMENT**

**VHF RADIOS**

Two (2) Icom VHF's with mic.

Two (2) Furuno FM-8900S VHF radio with mic. Demonstrated.

**SINGLE SIDEBAND RADIO**

Furuno FS-1592-25 Single SideBand Radio with mic. Powered up.

**COMPASSES**

4" Compass. Recommend having the compass swung, providing a current deviation card.

**MULTI-FUNCTIONAL NAVIGATION DISPLAYS**

Five (5) Navigation monitors. Demonstrated.

**FINDING C-23**

**AIS (AUTO IDENTIFICATION SYSTEM)**

Furuno FA-150 Universal AIS (Automatic Identification System) Transceiver. Demonstrated.

**CCTV CAMERA SYSTEM**

Engine room cameras, stern, aft deck camera, side decks, sundeck aft and flybridge cameras. Demonstrated.

**FINDING C-24**

**NAVIGATION COMPUTER**

Two (2) Navigation PCs with Nobeltec charts

**AUTOPILOT**

Anschutz Pilostar D. Demonstrated.

**FINDING C-25**

**NFU (NON-FOLLOW UP) & FU (FOLLOW UP) STEERING**

Anschutz Non-Follow Up Steering System with Jog Lever.

**MARINE RADAR**

Two (2) Furuno 92 Mile Marine Radar, with Open Array Radar Antennas.

**GPS CHARTPLOTTER**

Furuno GP-150 GPS/Chartplotter.

**DEPTH DISPLAY**

B & G (Brooks & Gatehouse) Network Depth Gauge.

**SPEED DISPLAY**

B & G (Brooks & Gatehouse) Network Speed Gauge.

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### WIND INSTRUMENT

B & G (Brooks & Gatehouse) Network True/Apparent Wind Speed & Direction Gauge.

### NAVIGATIONAL TELEX RECEIVER

Furuno Navtex NX-700 Navigational Telex Receiver.

### PBX TELEPHONE SYSTEM

Panasonic Telephone PBX System. Demonstrated.

### VESSEL MONITORING SYSTEM

A vessel multi system monitoring and alarm system was installed. Powered up.

### SECURITY ALARM SYSTEM

Security Alarm System.

**FINDING C-26**

### BAROMETER

Weems & Plath Barometer.

### THERMOMETER

Weems & Plath Thermometer.

### SHIP'S CLOCK

Weems & Plath Clock.

**FINDING C-27**

### ANTENNAS

The antennas were well mounted where sighted.

### ELECTRONICS COMMENTS

It was noted that the vessel had experienced a near lightning strike, the navigation electronics should be closely monitored over the coming months to ensure no damage has occurred. It would be beneficial to have a qualified marine electrician do a post survey of the vessel for any unseen damage.

### CONSIDERATIONS

Today's modern sophisticated electronic equipment can have hundreds of different functions, settings and calibrations, most of which are beyond the scope of this survey. If a detailed report as to the operating capacity of the vessel's electronic equipment is desired, it is recommended that a marine electronics expert be engaged.

## SAFETY EQUIPMENT

### *SAFETY EQUIPMENT (U.S.C.G.)*

#### WEARABLE PERSONAL FLOTATION DEVICES (33 CFR 175)

Seven (7) Child type I U.S.C.G. Approved PFD's.

Thirty One (31) Adult type I U.S.C.G. Approved PFD's.

#### THROWABLE PERSONAL FLOTATION DEVICES (33 CFR 175)

Two (2) Type IV - U.S.C.G. Approved Throwable Devices (rings).

#### FIRE EXTINGUISHERS (33 CFR 175.310)

Galley hood CO2 fixed system

(2) 2-lb. BC fire extinguishers

(2) 2.5-lb. ABC fire extinguishers

(3) 6-kg ABC fire extinguishers

5-kg CO2 fire extinguisher

6-kg dry chemical extinguisher

(9) 10-lb. ABC portable fire extinguishers  
(13) 5-lb. ABC fire extinguishers  
15-lb. CO2 Amerex extinguisher for control room  
(2) Oxygen bottles - Hydrostatic test due 2027  
Engine room fixed fire suppression system consisting of (4) 100-lb. CO2 bottles

**FINDING A-2**

**VISUAL DISTRESS SIGNALS (33 CFR 175.101)**

Day distress signals.

**SOUND PRODUCING DEVICES (33 CFR 83)**

Kahlenberg Triple Trumpet Air Horn, with Compressor. Powered up.

**SHIPS BELL**

A ship's bell was observed unmounted in the bridge.

**FINDING A-3**

**NAVIGATION LIGHTS (33 CFR 83)**

The Navigation Lights illuminated, except where noted in the findings appendix.

**U.S.C.G. NAVIGATION RULE BOOK (33 CFR 83) VESSELS OVER 39'4"**

The U.S.C.G. International and Inland Navigation Rule Handbook was observed onboard.

**"NO OIL DISCHARGE" PLACARD (33 CFR 151/155)**

Found properly displayed.

**"TRASH DISPOSAL" PLACARD (33 CFR 151/155)**

Found properly displayed in the Galley.

**"WASTE MANAGEMENT" PLAN (33 CFR 151) VESSELS OVER 39'4"**

Found properly displayed.

**GASOLINE ENGINE SPACE VENTILATION (33 CFR 175/183, 46 CFR 25)**

Provided by the hull side cowl vents.

**CONSIDERATIONS**

Recommend verifying what safety equipment conveys with the sale of the vessel.

***AUXILIARY SAFETY EQUIPMENT***

**VESSEL FIRE ALARM SYSTEM**

Sentrol fire alarm system.

**FIXED FIRE SUPPRESSION SYSTEM**

Four (4) 100-lb CO2 Fixed Fire Suppression Tanks in the ports side engine compartment. Automatic thermal and manual activation, with override switch.

**FIRE FIGHTING SYSTEM**

Fire fighting stations were located at various locations on board, with two (2) 230 volt MP Fire/Bilge Pumps. Recommend periodic test/prove of the systems.

**SMOKE DETECTORS (NFPA 302)**

All power/smoke monitoring lights illuminated.

**E.P.I.R.B.**

Two (2) EPIRB's on hydrostatic releases.

### LIFE RAFTS

Two (2) Oceanmaster 20-person canistered life rafts on hydrostatic release

### MAN OVERBOARD SYSTEM (MOB)

Lifesling2 M.O.B. Rescue Sling.

### BILGE HIGH WATER ALARMS

Bilge High Water Alarms were integrated into the Maretron Vessel Monitoring system. Test sounded.

### SEARCH LIGHT

(2) Remote operated searchlights

### FIRST AID SUPPLIES

First aid supplies were observed onboard. Highly recommend renewal of any outdated medical supplies.

### VESSEL SAFETY PLAN

Recommend implementing, posting and continually updating a Vessel Safety Plan, outlining all of the vessel's specific safety procedures and the locations, maintenance protocols and serviceability or expiration dates of all onboard safety equipment.

### ADDITIONAL SAFETY EQUIPMENT

Two (2) Rapid Ditch Bags were observed onboard.

## ***BILGE PUMPING SYSTEMS***

### ELECTRIC BILGE PUMPING SYSTEMS

AC electrical bilge/fire pump. Powered up.

### EMERGENCY BILGE PUMPING SYSTEMS

None sighted. Recommend installing engine intake seacock diverter valves (crash valves) to facilitate emergency bilge water drainage, utilizing the engine exhaust's discharge.

### CONSIDERATIONS

Highly recommend frequent testing of bilge pump operation, adequate dewatering ability and removal of any bilge pump debris.

## **UNDERWATER EQUIPMENT & HULL INSPECTION**

### PROPELLERS

5-bladed Nibral propellers measuring approximately 44" in diameter.

#### **FINDING C-28**

### PROPELLER SHAFTS

Stainless Steel, 4 1/2" inch diameter.

### PROPELLER SHAFT LOGS

Shaft logs were constructed of stainless steel.

### PROPELLER SHAFT STRUTS

Two (2) Stainless Steel I-Beam type propeller shaft struts.

### SHAFT STAVE BEARINGS

The stave bearings showed no signs of significant wear.

### RUDDER MATERIAL

Stainless Steel.

### RUDDER MOUNTING

Mounted in dripless rudder seal carrier bearings.

### THRUSTERS

Four bladed bow thruster propeller.

### ANTI-ROLL CONTROL STABILIZER SYSTEM

Naiad Marine System Electro-Hydraulic Anti-Roll Control Stabilizers, with port & starboard engine mounted PTOs (Power Take Offs).

#### FINDING B-15

### HULL SEA-STRAINERS

The raw water pickups appeared serviceable. Monitor/clean often.

### DRAINAGE THROUGH-HULLS

Bronze hull discharge/drainage through-hulls.

### HULL TRANSDUCERS

The transducers appeared serviceable, where sighted.

### HULL GROUNDING PLATES/EARTHING PLATES

One (1) each grounding plates were installed on the port & starboard aft hull bottom. Appeared serviceable.

### SACRIFICIAL ANODES

No significant waste was observed on the Zinc Anodes. Monitor frequently. Recommend Anode replacement once Anode reaches 50% depletion. The use of Zinc as an Anode is only recommended for saltwater applications. If the vessel is to be kept primarily in brackish water the Anodes should be changed to Aluminum; Magnesium if the vessel is kept in freshwater.

### PROPELLER PROTECTION

Provided partially by the keel.

### ANTIFOULING PAINT

A new coat of antifouling bottom paint was reportedly applied approximately 2 months prior.

### OSMOTIC HULL BLISTERS

No osmotic laminate blisters were sighted.

### HULL INSPECTION COMMENTS

Inspection of the hull's wetted surface was partially hindered, due to the vessel's position on the storage chocks. Unexposed areas precluded a thorough inspection. A percussion hammer sounding was performed on the hull's accessible wetted surfaces.

## FINDINGS & RECOMMENDATIONS

### FINDINGS LEAD-IN

The Findings & Recommendations section is only one section of the "Fortitude" survey report. If received on its own, this section should not be mistaken as this vessel's full survey report. **PLEASE BE ADVISED THAT SOME DEFICIENCIES, OBSERVATIONS AND SUGGESTIONS MAY ALSO BE CONTAINED IN THE BODY OF THE REPORT.**

Deficiencies noted under "FIRST PRIORITY/SAFETY FINDINGS" should be addressed before the vessel is next underway. These findings could represent an endangerment to personnel and/or the vessel's safe operating condition. Findings may also be in violation of U.S.C.G. Regulations, ABYC Voluntary Safety Standards & Recommended Practices or NFPA Codes & Standards.

Deficiencies noted under "SECONDARY PRIORITY/FINDINGS NEEDING TIMELY ATTENTION" should be corrected in the near future, so as to maintain and adhere to certain codes, regulations, standards or recommended practices (and safety in some cases) and to help the vessel to retain its value.

Deficiencies noted under "SURVEYOR'S GENERAL FINDINGS, NOTES AND OBSERVATIONS" are lower priority or cosmetic findings, which should be addressed in keeping with od marine maintenance practices and in some cases as a desired upgrade.

Deficiencies will be listed under the appropriate heading:

- A. FIRST PRIORITY/SAFETY FINDINGS
- B. SECOND PRIORITY/FINDINGS NEEDING TIMELY ATTENTION
- C. SURVEYOR'S GENERAL FINDINGS, NOTES AND OBSERVATIONS

### A: FIRST PRIORITY / SAFETY AND COMPLIANCE DEFICIENCIES

#### FINDING A-1 EXTERIOR STORAGE

Several of the hatch gas lift struts were loosening adrift at their mountings and some were missing.

#### RECOMMENDATION

Replace/refit the gas lift struts and fasteners, as necessary.

#### FINDING A-2 FIRE EXTINGUISHERS (33 CFR 175.310)

The fixed fire suppression system's and hand-held fire extinguisher's annual inspection certifications expire this month (Recertification is currently underway).

#### RECOMMENDATION

Recertify or replace the fire extinguishers to comply with ABYC and NFPA recommended standards for fire protection.

#### FINDING A-3 SHIPS BELL

A ship's bell was observed unmounted in the bridge.

#### RECOMMENDATION

Properly mount the ships bell for USCG compliance.

### B: SECONDARY PRIORITY / FINDINGS NEEDING TIMELY ATTENTION

#### FINDING B-1 BOARDING PASSERELLE

Some of the passerelle cabling was loose/adrift and some of the hydraulic hoses were damaged and had come adrift from their securing mounts. The motor mounts on the power pack were worn.

#### RECOMMENDATION

Investigate further and service, repair or replace, as necessary.

## FINDINGS & RECOMMENDATIONS

### FINDING B-2 COMMENTS

The port side aft deck hydraulic door did not fully close when tested ( possibly due to a worn hydraulic block).

### RECOMMENDATION

Service repair/replace, as necessary.

### FINDING B-3 HVAC/AIR CONDITIONING SYSTEM

Condensation leakage was observed in various areas of the air conditioning chiller line's insulation where it was compressed or poorly fit, resulting in moisture staining and leakage at various areas. Also the drip tray under the compressors in the engine room was heavily corroded.

### RECOMMENDATION

Clean, treat, repaint or recoat the surfaces (and apply corrosion inhibitor) to prevent corrosion or replace the hardware, as necessary. Refit or replace the insulation to prevent condensation leakage, as necessary. It is recommended that the air conditioning system have a full inspection/service by a qualified marine HVAC specialist.

### FINDING B-4 OVEN

The oven did not power up when tested (it is reported to have stopped working on the last charter).

### RECOMMENDATION

Investigate further/trace, and service, repair or replace as necessary.

### FINDING B-5 ENGINE DISPLAYS

The wing station engine display screens were UV damaged/darkened and partially illegible (the port engine display on the starboard wing station was blanked out).

### RECOMMENDATION

Replace the display screens, as necessary.

### FINDING B-6 ENGINE EXHAUST SYSTEM

Some of the exhaust hard coating is cracking and heat degraded.

### RECOMMENDATION

Investigate further, and refit as necessary.

### FINDING B-7 ENGINE BLOCK HEATERS

The engine block heaters did not power up when tested.

### RECOMMENDATION

Investigate further/trace, and service, repair or replace as necessary.

### FINDING B-8 SEACOCKS/SEA-VALVES

Several of the seacock valves were excessively stiff to turn.

### RECOMMENDATION

Service/lubricate or rebuild the seacocks to ensure emergency operation, as necessary.

### FINDING B-9 MACHINERY SPACE INSULATION

Some areas of engine room's insulation were degraded from moisture damage.

### RECOMMENDATION

Investigate further/trace, and repair/replace as necessary.



## FINDINGS & RECOMMENDATIONS

### FINDING B-10 BONDING SYSTEM (ABYC E-2 & E-11)

Some of the vessel's bronze alloy metals which are exposed to raw water contact or flow were not connected to the vessel's bonding system. Also, green verdigris corrosion was developing on many of the bilge's bronze alloy metals are exposed to raw water contact or water flow.

#### RECOMMENDATION

Properly connect all metals exposed to seawater contact or flow to the vessel's bonding system to help minimize electrolytic corrosion from stray current and/or enhance lightning protection, as necessary (ABYC E-2 & E-11).

### FINDING B-11 AC SYSTEM WIRING TYPE

Loose wiring was noted at several areas of the vessel.

#### RECOMMENDATION

Investigate further and re secure/repair or replace as necessary.

### FINDING B-12 GENERATOR EXHAUST SYSTEM

The starboard generator's dry stack valve flange is cracked and weeping from its freeze drain plug.

#### RECOMMENDATION

Replace the valve flange, as necessary.

### FINDING B-13 DESALINATION (FRESHWATER MAKING) SYSTEM

Some salt water residues were noted in the bilges under the low pressure pumps and the number two low pressure pump appeared to be weeping at its seal.

#### RECOMMENDATION

Investigate further, and service, repair or replace as necessary.

### FINDING B-14 STEERING HOSES/LINES

Rust leach staining has developed on the steering hose metal crimp fittings.

#### RECOMMENDATION

Monitor and replace the hoses, as necessary.

### FINDING B-15 ANTI-ROLL CONTROL STABILIZER SYSTEM

The port side stabilizer's junction box was loose/adrift.

#### RECOMMENDATION

Investigate further, and secure, repair or replace the junction box as necessary.

## C: SURVEYOR'S GENERAL FINDINGS, NOTES AND OBSERVATIONS

### FINDING C-1 GENERAL EXTERIOR CONDITION

Fiberglass/paint damage chipping and stress cracking was observed on the starboard side lower rub rail. Some general gelcoat/paint wear & tear, spider crazing or cracking, gouges and chipping were also observed at various other areas of the vessel and some of the engine paint had general wear & tear.

#### RECOMMENDATION

Investigate further, and repair in accordance with good marine practice as necessary.

## FINDINGS & RECOMMENDATIONS

### FINDING C-2 BILGES

Slight water was observed collecting in the engine room bilges. Water was observed collected at the port main engines outboard stringer and stains, corrosion, salt residues, and debris were observed in the bilges outboard of the port & starboard generators and engine exhaust mufflers. Dried salt residues were collected on the tank top surfaces and outboard of the stringers. Dried water leakage stains and chiller line condensation leakage were observed at various areas of the vessel's bilges. Several of the engine room bilge floorboards were loosely mounted and tilted when stepped on or were not installed.

#### RECOMMENDATION

Dry out all water and clean out fluids/debris, investigate further/monitor, trace all sources of water and fluids, address as necessary and re-secure loose floor boards.

### FINDING C-3 GENERAL BILGE CONDITION

Some of the bilge spaces required general cleaning/detailing and some of the bilges were due for paint refinishing. A loose tank top was noted on the black water tank top ( appears to be a replacement lid that was being fabricated and was abandoned).

#### RECOMMENDATION

Clean and repaint the bilges, remove the abandoned tank lid, as necessary.

### FINDING C-4 DECKING OVERLAY

Several of the Teak covering boards were thinned from prior sanding maintenance and were nearly past their sand-able rebates.

#### RECOMMENDATION

Consider replacing the affected Teak decking, as necessary. Also recommend checking the decking for moisture intrusion into the deck coring once the Teak has been removed for renewal, as other mitigation may be required as a result of moisture intrusion.

### FINDING C-5 RUB-RAILS

Some general wear & tear and denting was observed along the rub rails and some of the fasteners were rusted.

#### RECOMMENDATION

Refinish or replace the rub-rail strikers and hardware, as necessary.

### FINDING C-6 RADAR ARCH

Several spider cracks were noted on the port side base of the hardtop.

#### RECOMMENDATION

Investigate further, and repair in accordance with good marine practice as necessary.

### FINDING C-7 GENERAL HARDWARE CONDITION

Some of the vessel's exterior hardware and below decks bilge hardware has developed general corrosion or coating blistering.

#### RECOMMENDATION

Clean, treat, polish, repaint or recoat the surfaces (and apply corrosion inhibitor) to prevent corrosion or replace the hardware, as necessary. Note: A Collinite Metal Polish, LPS-3 or T-9 Boeshield type spray coating may provide corrosion protection on the surfaces that require continued attention.

### FINDING C-8 GENERAL CAULKING/SEALANT CONDITION

General weathering, lifting or separation has developed on some of the vessel's exterior caulking sealants and window seals.

#### RECOMMENDATION

Reef out and renew the caulking sealants and replace the seals, as necessary.

### FINDING C-9 WINDSHIELD

Some areas of the window's frit were blistered.

## FINDINGS & RECOMMENDATIONS

### RECOMMENDATION

Investigate further, and service, repair or replace as necessary.

### FINDING C-10 WINDSHIELD

The windshield wiper blades were weathered.

### RECOMMENDATION

Replace the wiper blades, as necessary.

### FINDING C-11 SPRAY-SHIELD

Some general UV/heat crazing has developed on the flybridge spray-shield.

### RECOMMENDATION

Replace the spray-shield, as necessary.

### FINDING C-12 HAND RAILS/GRAB RAILS

Some of the stainless steel handrails showed signs of rust spots.

### RECOMMENDATION

Polish the hand rails, as necessary.

### FINDING C-13 DAVIT/CRANE

The gantry crane inspection hatches were noted to be blistering and some of the hardware had verdigris corrosion.

### RECOMMENDATION

Repair, as necessary.

### FINDING C-14 LINE WARPING CAPSTANS

The port aft deck's line warping capstan winch foot control cover was cracked and UV degraded.

### RECOMMENDATION

Replace, as necessary.

### FINDING C-15 EXTERIOR STORAGE

Several of the locker door hinges & latches required adjustment. Some of the weatherstripping on the locker doors is tacky and sticking together.

### RECOMMENDATION

Investigate further, and service, refit, repair or replace as necessary.

### FINDING C-16 INTERIOR CABINETRY & TRIM

Some of the interior wood work was water damaged and lifting.

### RECOMMENDATION

Refinish the affected wood work, as necessary.

### FINDING C-17 INTERIOR STORAGE

Several of the cabinet door hinges & button latches required adjustment.

### RECOMMENDATION

Refit, refinish, repair or replace, as necessary.

### FINDING C-18 CEILING HEADLINERS

The interior vinyl headliners and wall-liners were sagging in some areas (appeared to have failed foam adhesives).

## FINDINGS & RECOMMENDATIONS

### RECOMMENDATION

Refinish or replace the vinyl, as necessary.

### FINDING C-19 INTERIOR JOINER WORK COMMENTS

Some of the vessel's interior joiner work and trim was adrift or removed.

### RECOMMENDATION

Refit, refinish, repair or replace, as necessary.

### FINDING C-20 WATER INTRUSION COMMENTS

Water incursion signs (staining or moisture) were observed under some of the portholes.

### RECOMMENDATION

Investigate further/monitor, to determine if leakage is active and address as necessary.

### FINDING C-21 HVAC/AIR CONDITIONING SYSTEM

The crew pantry airhandler fan unit was emitting a squeaking sound.

### RECOMMENDATION

Investigate further, and service, repair or replace as necessary.

### FINDING C-22 ANCHOR WINDLASS

Cracks and chipped paint was noted at the base of the anchor windlasses, as well as some of the fasteners not painted.

### RECOMMENDATION

Service, repair or repaint as necessary.

### FINDING C-23 MULTI-FUNCTIONAL NAVIGATION DISPLAYS

The port side inboard Multi-Functional Navigation screen's dimmer did not function when tested.

### RECOMMENDATION

Investigate further, and service, repair or replace as necessary.

### FINDING C-24 CCTV CAMERA SYSTEM

The monitor in the crew mess is discolored.

### RECOMMENDATION

Service, repair or replace as necessary.

### FINDING C-25 AUTOPILOT

The autopilot was not integrated into the navigation system (however it did function).

### RECOMMENDATION

Investigate further and configure as necessary.

### FINDING C-26 SECURITY ALARM SYSTEM

Some of the door sensors were noted to have been removed from the system (notably the main salon aft port and starboard doors).

### RECOMMENDATION

Investigate further and replace if needed.

### FINDING C-27 SHIP'S CLOCK

The clock did not power up (may require new batteries).

## FINDINGS & RECOMMENDATIONS

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### RECOMMENDATION

Investigate further, and service, repair or replace as necessary.

### FINDING C-28 PROPELLERS

The port propeller blade had an impact ding, and had been removed for repair.

### RECOMMENDATION

Properly refit the propeller and propeller nuts to comply with ABYC Standards, as necessary. ABYC P-6 Ap. 6.2, SAE J755 (thin nut in front and thick nut behind).

## SUMMARY

### VESSEL CONDITION

It is the Surveyor's experience that develops an opinion of the OVERALL VESSEL RATING OF CONDITION, after the Survey has been completed and the findings have been organized in a logical manner.

The grading of condition developed by BUC RESEARCH and accepted in the marine industry for a vessel at the time of Survey, determines the adjustment to the range of base values in the BUC USED BOAT PRICE GUIDE for a similar vessel sold within a given time period, as a consideration to determine the Market Value.

The following is the accepted Marine Grading System of Condition:

"EXCELLENT (BRISTOL) CONDITION", is a vessel that is maintained in mint or bristol fashion (usually better than factory new, loaded with extras, a rarity).

"ABOVE AVERAGE CONDITION", has had above average care and is equipped with extra electrical and electronic gear.

"AVERAGE CONDITION", ready for sale requiring no additional work and normally equipped for her size.

"FAIR CONDITION", requires usual maintenance to prepare for sale.

"POOR CONDITION", substantial yard work required and devoid of extras.

"RESTORABLE CONDITION", enough of hull and engine exists to restore the boat to usable condition.

As a result of the Survey, as shown in the REPORT OF MARINE SURVEY & FINDINGS AND RECOMMENDATIONS sections of this report and by virtue of my experience, my opinion is:

AVERAGE

### STATEMENT OF VALUATION

1. The "FAIR MARKET VALUE" is the most probable price in terms of money which a vessel should bring in a competitive and open market under all conditions requisite to a fair sale, the buyer and seller, each acting prudently, knowledgeably and assuming the price is not affected by undue stimulus. Implicit in this definition is the consummation of a sale as of a specified date and the passing of title from seller to buyer under conditions whereby:

- a. Buyer and seller are typically motivated.
- b. Both parties are well informed or well advised, and each acting in what they consider their own best interest.
- c. A reasonable time is allowed for exposure in the open market.
- d. Payment is made in terms of cash in U.S. dollars or in terms of financial arrangements comparable thereto; and
- e. The price represents a normal consideration for the vessel sold unaffected by special or creative financing or sales concessions granted by anyone associated with the sale.

### CONCLUSION:

After consideration of the reliability of the data, the extent of the necessary adjustments and condition of the vessel, it is the Surveyor's opinion that the "FAIR MARKET VALUE" of the subject vessel is:

## SUMMARY

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7,500,000

Seven Million, Five Hundred Thousand

2. The "ESTIMATED REPLACEMENT COST" indicates the retail cost of a new vessel of the same make/model with similar equipment offered by the same manufacturer. "ESTIMATED REPLACEMENT COST" of the subject vessel is:

28,700,000

Twenty-Eight Million, Seven Hundred Thousand

## SUMMARY

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### SUMMARY

In accordance with the request for a Marine Survey of the Fortitude, for the purpose of evaluating its present condition and estimating its Fair Market Value and Replacement Cost, I herewith submit my conclusion based on the preceding report. The subject vessel was personally inspected by the undersigned on 09/04-05-18/24

. Subject to correction of deficiencies listed in sections A and B, the vessel is considered to be reasonably suitable for its intended use. Other deficiencies listed should be attended to in keeping with good maintenance practices or as upgrades.

### SURVEYOR'S CERTIFICATION

We certify that, to the best of our knowledge and belief:

The statements of fact contained in this report are true and correct.

The reported analyses, opinions and conclusions are limited only by the reported assumptions and limiting conditions, and are our personal, unbiased professional analyses, opinions and conclusions.

We have no present or prospective interest in the vessel that is the subject of this report and we have no personal interest or bias with respect to the parties involved.

Our compensation is not contingent upon the reporting of a predetermined value or direction in value or direction in value that favors the cause of the client, the amount of the value estimate, the attainment of a stipulated result or the occurrence of a subsequent event.

We have made a personal inspection of the vessel that is the subject of this report.

This report is submitted without prejudice and for the benefit of whom it may concern.

Justin Grubb, IAMCS # 22CSF896 / YIII Marine Engineer

 and

Simon Bridgwood, NAMS-CMS # 109-1087







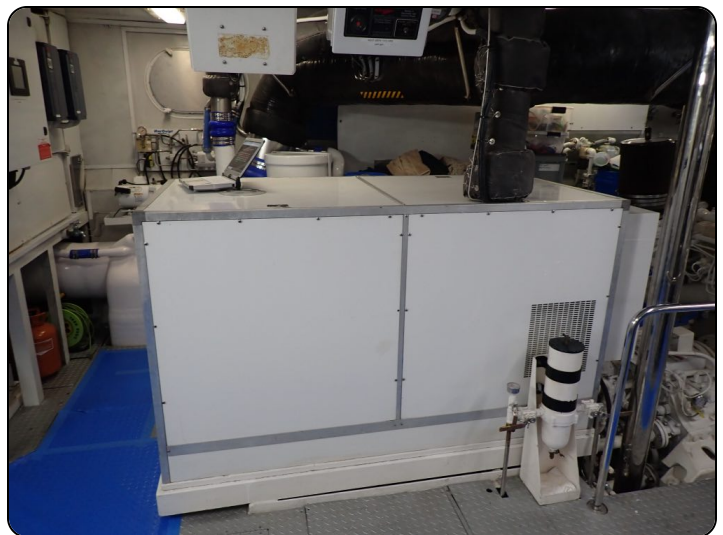
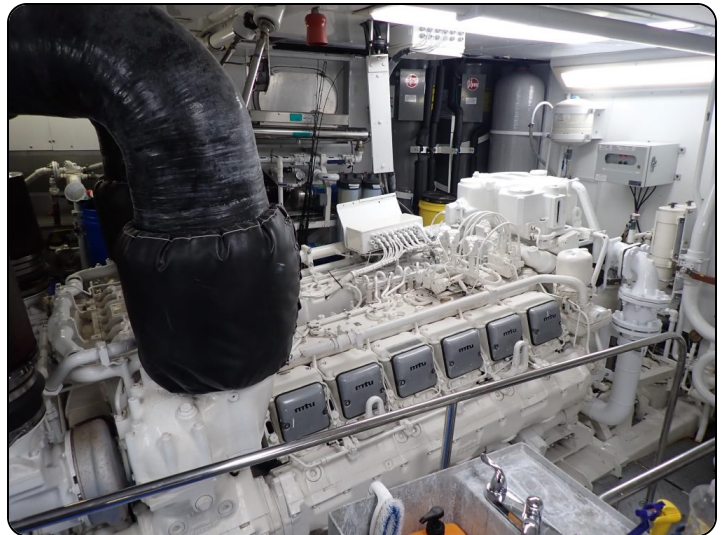
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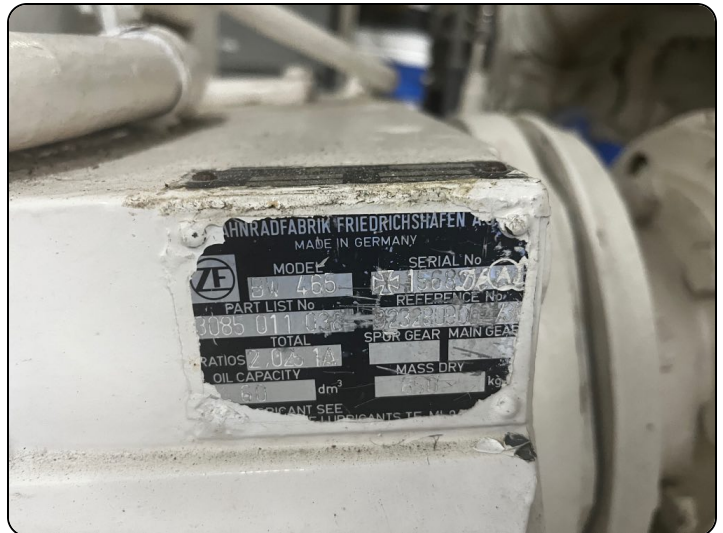
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