CWS MARITIME SERVICES, LLC

2010 Sea Ray Boats 450 Sundancer

"[redacted]"

Membership with the Society of Accredited Marine Surveyors and the American Boat & Yacht Council

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[redacted]

2010 Sea Ray Boats 450 Sundancer

CONDUCTED BY

Charles W Solarek, AMS 1161, Y&SC

CWS MARITIME SERVIES, LLC

PREPARED FOR

[redacted]

Inspected on June 06, 2022. Report written June 14, 2022

INTRODUCTION

PURPOSE & SCOPE

The attending surveyor attended aboard the 2010 Sea Ray Boats 450 Sundancer "[redacted]", at the request of [redacted]. Inspected on June 06, 2022. Report written June 14, 2022. The survey was requested to determine the physical condition and value 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.

CONDUCT OF SURVEY

This survey was completed using as reference the federal regulations and amendments issued and enforced by the United States Coast Guard under the authority of Title 33 and Title 46 of the United States Code of Federal Regulations (CFR's). In addition the American Boat and Yacht Council (ABYC) and National Fire Protection Association (NFPA-302) voluntary standards were used as reference during the survey. These ABYC and NFPA voluntary standard practices are generally followed by most vessel manufacturers today. This survey report is not a guarantee complete or full compliance with these references.

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.

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.

DISCLAIMER

Acceptance and use of this report by the client acknowledges the client’s understanding that the report has been composed of information that is believed to be true after reasonable investigation and inquiry but is not warranted to be so. The information was obtained without drilling, diving, ultrasonic, cleaning or opening up to expose parts or conditions ordinarily concealed. There were no tests for tightness or soundness conducted other than the conditions noted visually.

Acceptance and use of this report acknowledges the client’s understanding that no determination of stability or structural strength has been made and no opinion is expressed.

Acceptance and use of this report acknowledges the client’s understanding that X Surveyors Ltd. does not accept any responsibility for damage or deterioration not found or discovered during the course of survey, nor for consequential damage, deterioration or loss due to any error or omission.

The Client hereby undertakes to keep the Surveyor/Consultant and its employees, agents and sub-contractors indemnified and to hold them harmless against all actions, proceedings, claims, demands or liabilities whatsoever or howsoever arising which may be brought against them or incurred or suffered by them, and against and in respect of all costs, loss, damages and expenses (including legal costs and expenses on a full indemnity basis) which the Surveyor/Consultant may suffer or incur (either directly or indirectly) in the course of the services under these Conditions.

Notwithstanding the above clause, in the event that the Client proves that the loss, damage, delay or expense was caused by the negligence, gross negligence or wilful default of the Surveyor/Consultant aforesaid, then, save where loss, damage, delay or expense has resulted from the Surveyor’s/Consultant’s personal act or omission committed with the intent to cause same or recklessly and with knowledge that such loss, damage, delay or expense would probably result, the Surveyor’s/Consultant’s liability for each incident or series of incidents giving rise to a claim or claims shall never exceed a sum calculated on the basis of ten times the Surveyor's/Consultant's charges.

ENCLOSURES

Enclosure (1) Power Boat Guide description
Enclosure (2) ABOS valuation
Enclosure (3) Soldboats comparable
Enclosure (4) Fluid analysis reports
Enclosure (5) DIESEL LAPTOPS engine data

SURVEYOR NOTES

UNDERWAY DEMONSTRATION

An underway demonstration was conducted as part of this survey. Results are reported in the appropriate sections of this report.

OUT OF WATER INSPECTION COMMENTS

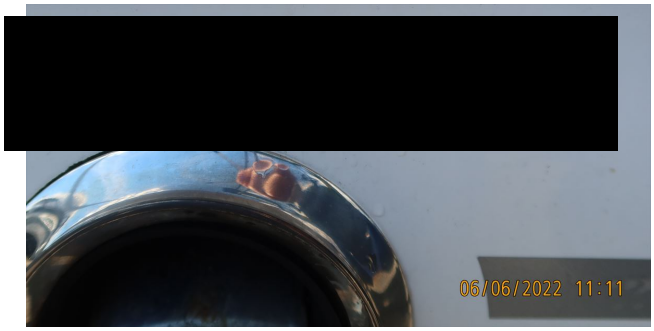
An out of the water inspection of the hull's wetted surfaces and running gear was performed during the survey inspection.

ELECTRICAL INSPECTION COMMENTS

AC shore power was used to check AC electrical systems.
The AC generator set was also used to check the AC electrical system and its components.
Ship's DC power was used to check DC electrical systems.

HIN (HULL IDENTIFICATION NUMBER)

SERP[redacted]
The vessel's HIN (Hull Identification Number) was verified during the survey inspection.
The Hull Identification Number (HIN) is in agreement with the vessel's USCG on-line documentation.
A true digital photograph of the HIN of the referenced vessel is shown here.



ENGINE/MECHANICAL SURVEY

A mechanical inspection was conducted as part of this survey by the undersigned surveyor. Results can be found in the appropriate sections of this report.

GENERAL VESSEL INFORMATION

TYPE OF SURVEY REQUESTED:	Pre-Purchase Condition & Value with an Abbreviated Mechanical.
FILE NUMBER:	CWS-2022-[redacted]
DATE OF SURVEY:	June 06, 2022
DATE OF WRITTEN REPORT:	June 14, 2022
LOCATION OF SURVEY INSPECTION:	Union Marine Showroom, Seattle, WA; Union Marine Service Boatyard, Seattle, WA; The waters of Lake Union & Lake Washington, Seattle, WA.
HOW SURVEY CONDUCTED:	The vessel was surveyed both while afloat & hauled out of the water, in "Travelift" slings.
WEATHER CONDITIONS PRESENT:	Partly cloudy & warm.

PERSONS IN ATTENDANCE DURING SURVEY:	[redacted] (potential buyer), [redacted] (broker), and undersigned surveyor.
VESSEL BUILDER:	Sea Ray Boats Inc.
VESSEL TYPE:	Express cruiser
INTENDED USE:	Subject vessel is intended for recreational use. Waterways to be used upon shall be determined by the insurance underwriter(s).
VESSEL DESCRIPTION:	Taken from Power Boat Guide and attached to end of report.
HIN (HULL IDENTIFICATION NUMBER):	SERP[redacted]
DOCUMENTED HAILING PORT:	Edmonds, WA
HAILING PORT DISPLAYED:	Edmonds, WA
U.S.C.G. DOCUMENTATION NUMBER:	[redacted](current)
U.S.C.G. DOCUMENTED FOR:	Recreation
DOCUMENTATION DIMENSIONS:	Length: 40.8 feet Breadth: 12.9 feet Depth: 7.2 feet Gross Registered Tonnage (GRT): 25 Net Registered Tonnage (NRT): 20
STATE REGISTRATION:	Current registration and/or State issued title was not available for inspection. These documents will be required for any transfer of ownership and the numbers on the documents should match the vessel.
STATE REGISTRATION DECAL NUMBER:	D 7[redacted] State validation sticker is current.
POWER BOAT GUIDE VESSEL DIMENSIONS:	Length w/platform: 45' 5" Beam: 13' 2" Draft: 3' 10" Weight: 27,205# Deadrise aft: 19 degrees. All dimension values taken from Power Boat Guide.
EQUIPMENT MANUALS:	Yes manuals sighted for various ships equipment.

RATING & VALUATION

VESSEL OVERALL RATING:	AVERAGE
ESTIMATED MARKET VALUE:	$456,000.00
ESTIMATED REPLACEMENT COST:	$1,215,000.00 Per BUC

VESSEL CONSTRUCTION

HULL ARRANGEMENT

HULL DESIGN TYPE

Modified-V, planing type, with flared bow, hard chines and lifting strakes.

HULL MATERIAL

FRP (fiber reinforced plastic).

HULL EXTERIOR

Fiberglass, with white gel coat surface.

ABOVE WATERLINE HULL FITTINGS

Stainless steel mushroom used for; engine exhaust, generator exhaust, cockpit/deck drains, bilges/sump drains, and A/C discharge drain(s).

Vents also sighted for: fuel, water, and waste tanks.

Cowling covers also sighted for head and galley exhaust fans and vacuum discharge vent.

All thru hull fittings are adequately secured and sealed to hull.

PORTHOLES

Port: five (5)

Starboard: five (5)

CHAIN LOCKER

Accessed from top deck with port and starboard hatches with locks. Functional.

Drains overboard at the port & starboard lower bow.

ENGINE VENTS

Yes, in place and vents in good condition, secure with no cracks sighted.

EXTERIOR FINISH

White gel coat surface.

Random percussion hammer testing on hull sides showed no evidence of any delamination on hull sides.

GENERAL EXTERIOR CONDITION

Hull cosmetics are in good condition with only minor nicks and scratches.

TRANSOM

Reverse transom with transom swing gate, starboard side.

Well secured, no cracks or defects sighted. No delamination when checked with a percussion hammer.

SWIM PLATFORM

Electro-hydraulic swim platform/tender lift with dinghy chocks. Demonstrated.

BOARDING SWIM LADDER

Telescoping stainless steel boarding ladder installed at the swim platform. Well secured.

FINDING B-1

BULKHEADS

Athwartships reinforcement enhanced by bulkheads, bonded/tabbed to the hull with FRP (fiber reinforced plastic).

All tabbing appears serviceable and sound with no cracks or separation of tabbing sighted in any compartments. No visual evidence of movement sighted in any bulkhead.

STRINGERS/TRANSVERSALS

Hull stiffness provided by heavy hollow FRP longitudinal stringers that run the length of the vessel. Complete inspection not possible due to limited access.

Stringers were sighted in the engine compartment and under cabin sole and are well glassed into hull where sighted.

Stringers sounded with hammer where accessible and appeared very sound.

No soft spots, separation, cracks or splitting sighted. Limber holes appear to be adequately sealed where sighted.

Stringers checked with moisture meter where accessible and all readings were relatively dry.

STEM

Solid stem. Chain locker drains thru both sides of the stem.

No cracks or separation sighted inside.

BILGES

A gelcoat or painted surface was used in the bilges. Recommend keeping the bilges clean & dry.

BILGE LIMBER HOLES

The limber holes appeared to be appropriately sized, but were clogged in some areas.

FINDING C-2

GENERAL BILGE CONDITION

Some of the bilge spaces required general cleaning/detailing.

VESSEL LIST

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

MOISTURE COMMENTS

Random percussion hammer testing on hull sides showed no evidence of any delamination on hull sides.

DECK ARRANGEMENT

DECK SURFACE

Reportedly, cored FRP (fiber reinforced plastic) with white gelcoat and textured non-skid.

Good condition. Deck is solid under foot, no soft spots discovered, and no visible cracks or chips sighted.

Random percussion hammer testing on horizontal deck surface showed no evidence of any delamination.

All moisture meter readings on the fore decks were relatively dry with normal comparative moisture meter readings.

DECKING OVERLAY

Teak deck overlay at the helm area.

Random percussion hammer testing showed no evidence of any delamination.

TOE-RAILS

Molded fiberglass toe-rails (part of the deck's layup). No cracks or separation sighted.

RUB-RAILS

Well secured in good condition with only minor scrapes.

HULL-TO-DECK JOINT

No leaks sighted thru any part of hull to deck joint area where visible, as sighted in anchor locker and in the engine compartment.

COMMENTS

The Electrophysics moisture meter, Model GRP33plus was used for moisture readings referenced in this report.

BRIDGE ARRANGEMENT

BRIDGE MATERIAL

Reportedly, cored FRP (fiber reinforced plastic).
Good condition. Deck is solid under foot, no soft spots discovered, and no visible cracks or chips sighted.
Random percussion testing revealed no delamination or soft spots.

BRIDGE TYPE

The express bridge provided the helm station and crew seating area.

HARD-TOP

Fiberglass sport spoiler, with retracting sunroof. Functional.
Random percussion hammer testing showed no evidence of any delamination.

RADAR ARCH

Fiberglass Sport Spoiler/Radar Arch.
Random percussion hammer testing showed no evidence of any delamination.

UNDERWATER EQUIPMENT & HULL INSPECTION

DATE OF LAST HAUL

Unknown

DRIVES

Mercury Marine/Cummins Marine Zeus Pod Drives.

TRIM TAB SYSTEM

Mercury Marine Electro-Hydraulic Trim Tabs.

HULL TRANSDUCERS

The transducers appeared serviceable, where sighted.

SACRIFICIAL ANODES

The underwater zinc anodes appeared serviceable. Monitor frequently.

Monitor all anodes frequently and replace when they are no more than 50% wasted. 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. Anodes are normal replacement items designed to protect the running gear from electrolytic corrosion. Keep spares aboard vessel.

ANTIFOULING PAINT

The antifouling bottom paint appeared serviceable.

Always consult with a marine boat yard for recommendations on how to properly paint the hull bottom.

OSMOTIC HULL BLISTERS

No osmotic laminate blisters were sighted.

NOTE: Blisters are an unknown factor on all boats and if not currently present, there is no guarantee that they will not appear in the future. Blisters have a tendency to dry out over winter storage unless severe or large. Blisters (if any) best appear after vessel has been in water for an entire season. In addition, the symptomatic evidence of blistering can be obscured by bottom coatings, a dry storage period during which blisters spontaneously depressurize, bottom laminate sanding, and other conditions or actions. Recommend full inspection for blisters immediately after haul-out and power wash. Surveyor has no firsthand knowledge of the history of bottom maintenance, blistering, repairs or prophylactic coatings on this vessel.

HULL SURFACE COMMENTS

No cracks or separation sighted on any portion of hull bottom.

No evidence of grounding damage sighted on the hull bottom.

No delaminated areas were identified on the hull's wetted surfaces, where accessible.

COMMENTS

Moisture meter readings not taken since the type of bottom paint used would provide false moisture readings.

EXTERIOR EQUIPMENT

COCKPIT/AFT DECK EQUIPMENT

DC electric hatch for access to the engine compartment. Functional.

The cockpit included: (1) a wet-bar sink, cold water only. Sink was functional and no leaks sighted; (2) a DC powered U-Line Refrigerator/Freezer. Powered up in both AC and DC modes. Appeared to be functional. (3) an electric grill. Burner tested and was functional.

TELEVISION

Sansui HD flat screen mounted on the starboard side of the cockpit. Not tested.

EXTERIOR SEATING

Vinyl stand/sit padded bolster seat at helm and side companion bench seat.

U-Shaped seating in open cockpit area.

Sun lounge on the transom.

All vinyl seat coverings are in good condition. No holes or tears sighted.

GENERAL EXTERIOR SOFT-GOODS CONDITION

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

GENERAL HARDWARE CONDITION

No significant corrosion was observed on the vessel's hardware.

GENERAL CAULKING/SEALANT CONDITION

General weathering has developed on some of the vessel's exterior caulking sealants and weather stripping.

EXTERIOR LIGHTING

Deck courtesy lights, overhead lighting, engine compartment lighting, and underwater lights. All illuminated when tested.

EXTERIOR WASHDOWNS

Freshwater washdowns were located in the chain locker, the engine compartment and transom locker. Not tested.

EXTERIOR SHOWER

Hot/cold shower in the starboard aft cockpit. Tested and is functional.

CABIN VENTILATION

Provided by the forward escape hatch, the portholes, and the companionway door.

EMERGENCY EGRESS HATCH

Forward on foc'sle. Appears to be of the correct size and to be fully functional.

PORTHOLES/PORTLIGHTS

Fixed and opening portholes were located on the hull sides.

EXTERIOR DOORS

Sliding FRP door for cabin entrance with lock. Functional.

WINDSHIELD

Tempered glass windshield with two (2) windshield wipers/washers.
Center section has double powered vents for ventilation. Demonstrated.

WINDSHIELD WIPERS

Two (2), demonstrated.

DECK RAILINGS

Stainless steel railings & cable lifelines ran from forward of the cockpit around the forward perimeter of the vessel. Well secured.

BOW RAILING

Stainless steel bow railings integrated into the deck railing. Well secured.

HAND RAILS/GRAB RAILS

Stainless steel on the sides of the hard top. All appear to be well secured.

CLEATS

Cleats throughout the vessel were stainless steel horn type. All appear to be well secured to deck and functional.

ANCHOR PLATFORM

Stainless steel fairlead anchor roller chute. Well secured and appears to be functional.

EXTERIOR STORAGE

Various exterior lockers and storage areas appeared serviceable, where sighted.

ROD HOLDERS

Rod holders were installed in the cockpit gunwales.

CANVAS

Camper style blue canvas enclosure for the cockpit with plastic window panels. All canvas is in good condition.

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).

ELECTRONICS & NAVIGATION EQUIPMENT

UPPER HELM STATION

HELM STATION

Express bridge, starboard side.

VHF RADIOS

Raymarine RayMic VHF Radio. Powered up.

COMPASS

Ritchie compass. Appears to be functional.

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

MULTI-FUNCTIONAL NAVIGATION DISPLAYS

Raymarine Hybrid Touch multi-functional navigation display, with HD digital marine radar, GPS chartplotter and network sonar. Powered up. Demonstrated.

AUTOPILOT

Mercury Marine SmartCraft Precision Pilot with Skyhook Technology, integrated into the Zeus Pod Drive System. Demonstrated.

MARINE RADAR

Raymarine HD digital radar. Demonstrated.

VESSEL MONITORING SYSTEM

Mercury Marine SmartCraft VesselView Digital Monitoring Display. Powered up. Demonstrated.
Sea Ray Boats Systems Monitoring System Alarms (audible/visual). Demonstrated (high bilge alarms).

ANTENNAS

The antennas appeared to be well mounted, where sighted (observed from deck level).

STEREO SYSTEM

Sony remote RM-X55M for the main cabin stereo. Not tested.

ELECTRONICS COMMENTS

All electronics appeared to be operational during the underway demonstration unless otherwise noted.

GROUND TACKLE

ANCHORS

Kodiak stainless steel plow anchor. Plow type. Size not marked.

ANCHOR RODE TYPE

Galvanized chain. Recommend measuring the full length of the anchor rode.

ANCHOR WINDLASS

Quick Nautical Equipment 12-volt Windlass.
Foot controls are operational for raising or lowering anchor. Helm controlled switch is functional.

COMMENTS

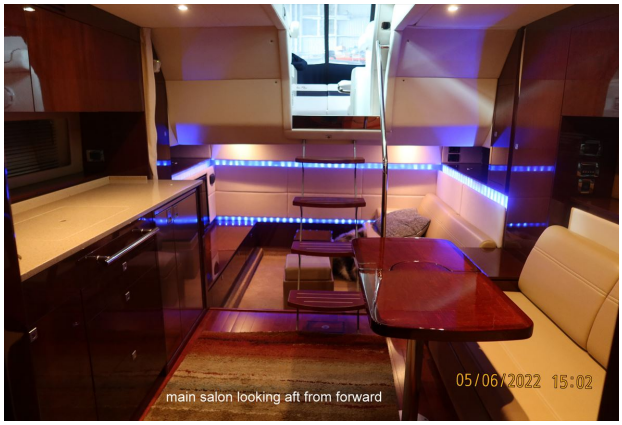
Highly recommend at least one additional spare anchor and rode for emergencies and added anchoring options.

CABIN APPOINTMENTS

MAIN CABIN/SALON

STYLE

Contemporary



DINETTE

A dinette was arranged in the port salon with "L" shaped seating around the table.
Table may be removed for additional berth.

INTERIOR CABINETRY & TRIM

The interior gloss finished cherry cabinetry and trim appeared serviceable.

INTERIOR DOORS

Gloss finished cherry cabin doors. All appeared to be functional.

INTERIOR STORAGE

The cabinets, lockers, drawers and shelving appeared serviceable, where sighted.

HEADLINER

Headliner material was vinyl.
Clean and well fastened. No tears, splits or stains sighted.

PORTHOLES

No signs of leakage or corrosion sighted, except as noted. Appear to be functional.

FINDING C-3

WINDOW TREATMENTS

Cherry wood blinds in the master stateroom and main cabin.

SOLE

Cherry wood planking in the main cabin and v-berth areas.
Carpeting in the media area.
Linoleum type flooring in the head and shower.

INTERIOR MIRRORS

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

GENERAL INTERIOR FURNISHINGS & SOFT-GOODS CONDITION

All in very good condition.

INTERIOR JOINER WORK COMMENTS

The interior joiner work appeared serviceable.

INTERIOR BULKHEADS

Cherry wood bulkheads.

WATER INTRUSION COMMENTS

Some exceptions were observed (see Findings Appendix).

FINDING C-4

LIGHTING

12 Volt DC lighting fixtures. All lights illuminated.

COMMENTS

Interior is in very good condition.

AUDIO/VISUAL EQUIPMENT

TELEVISION SYSTEM

One (1) Toshiba 32" television in the Master Stateroom.
One (1) 42" Sharp television in the "media room".

Television and entertainment electronics not tested. Client is advised to have owner demonstrate operation on the entertainment electronics. INFORMATIONAL ONLY

STEREO SYSTEM

Media room - Sony DVD/SA-CD stereo system. Not tested.
Main cabin - Sony marine CDX-H910UI, USB/iPOD/MP3/WMA/AAC. Not tested.

SATELLITE TELEVISION SYSTEM

Dish Digital Satellite TV Receiver.
KVH TracVision Digital Satellite TV Antenna and receiver.

GALLEY

LOCATION

Starboard side "Corian" type counters.

REFRIGERATION

Isotherm by Indel Marine stainless-steel refrigerator/freezer, model 1200BB4YK0000, serial number 4160253. Refrigeration tested on both AC and DC circuits separately and powered up in both modes. Appeared to be functional.

STOVE

Kenyon double burner stove with ceramic glass cooktop. Burners tested and are functional.
Stove top is recessed which meets the intent of ABYC Standards to secure cookware.

STOVE BURNER HEAT PROTECTION

Simulated Granite Corian burner cover, with safety switch. Demonstrated.

MICROWAVE OVEN

Panasonic stainless steel microwave oven. Powered up.

COFFEE MAKER

Krups Coffee Maker. Not tested.

GALLEY SINK

Stainless steel sink. Pressurized hot and cold-water fixture. No leaks sighted when tested.

BERTHS/STATEROOMS

ACCOMMODATION ARRANGEMENT

Master stateroom berth in the v-berth, sleeps two (2).
Dinette conversion sleeps two (2).
Aft conversion sofa sleeps two (2).

MASTER STATEROOM

In V-berth area Queen size mattress with raised island bed.
Head end of bed may be raised. Functional.

HEADS

HEAD ARRANGEMENT

One (1) Sealand Vacuflush 12-volt toilet on starboard side off main salon area with mater stateroom access. Demonstrated.

HEAD SINKS

Stainless steel with "Corian" type counters. Hot and cold pressure water fixture at sink. No leaks sighted.

HEAD EXHAUST VENTILATION FANS

An exhaust fan was installed in the head and shower. Powered up.

SHOWER ARRANGEMENT

Separate stand up or sit-down shower stall.

SHOWER SUMP PUMP

Located in sump tank with auto float and Atwood Sahara 750 GPH automatic bilge pump. Pump tested satisfactory.

INTERIOR SYSTEMS & EQUIPMENT

HVAC/AIR CONDITIONING SYSTEM

One (1) 8,000 BTU unit in the master stateroom below the berth.
One (1) 14,000 BTU unit in the main cabin.
One (1) unit on the cockpit that was not sighted due to access with unknown capacity.
Units were checked for cooling and heating function on reverse cycle. The units appeared to function properly in both modes, except as noted.

VACUUM SYSTEM

Beam Central Vacuum System with hose and attachments. Not tested.

ELECTRICAL SYSTEMS

DC ELECTRICAL SYSTEMS

DC SYSTEMS VOLTAGE

12-volt system

BATTERY SET 1

Four (4) Optima "Blue Top" 12-volt sealed AGM batteries in the engine compartment, centerline bilge area (5/21).

BATTERY SWITCHES

Three (3) energizing solenoid switches located in the main electrical panel. The solenoids powered up when tested.

BATTERY PARALLEL SWITCHING

Battery parallel switch installed at the helm station. Not tested.

DC PANLEBOARD

Yes, in the engine compartment.

SECONDARY PANEL

Yes, at the helm station and in the main salon.

DC ELECTRICAL PANEL BREAKERS/FUSES

All DC circuits are adequately protected by branch breakers or are fused.

BATTERY MONITORS

Switched analog gauge to test battery condition. Appears to be functional.

DC ELECTRICAL SYSTEM MONITORS

Analog DC voltage & amperage gauges in the main electric panel. Appear to be functional.

BATTERY CHARGERS

ProMariner ProNautic 1250 c3 - 12 volt / 60 amp. battery charger. Appears to be functional.

DC POWER OUTLETS

12 Volt outlets at the helm, main cabin, and stateroom. Not tested.

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

Twin engines are properly connected to each other by a common conductor circuit. The remaining ground/bonding system is well established where sighted; electrical system, seacocks, sea strainers, pumps, fuel system/tanks, hull zincs were all bonded. The bonding system is using individual green insulated wire or copper strips.

DC SYSTEM WIRING TYPE

Appeared serviceable for intended use, where sighted.

DC ELECTRICAL/WIRING COMMENTS (ABYC E-11)

Ring spade or crimp on connectors sighted for wiring connections.

All wiring runs are properly secured every 18" per ABYC E-11 recommendations.

AC ELECTRICAL SYSTEMS

AC SHORE POWER SYSTEM VOLTAGE

Marinco 30 Amp - 125-volt system.

AC SHORE POWER INLETS

Two (2) Marinco 30 amp/125-volt shore power inlets located in the transom locker.

A permanently mounted waterproof warning label is located at the shore power inlet location as recommended in ABYC Standard, E-11 AC & DC ELECTRICAL SYSTEMS ON BOATS.

AC SHORE POWER CORDS

Marinco 30 Amp. vinyl shore power cord.

AC PANELBOARD

Yes, in the main salon.

MAIN AC SHORE POWER BREAKERS

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

Separate shore power breakers (one for each inlet) are also available at the shore power inlet which is over 10' from power distribution panel per ABYC recommendations.

AC ELECTRICAL PANEL BREAKERS

AC branch breakers in the salon's main AC electrical panel.

AC ELECTRICAL SYSTEM MONITORS

Analog AC voltage & amperage gauges in the main AC electric panel. Appear to be functional.

AC ELECTRICAL SOURCE SELECTOR SWITCHING

Manual slide type located in the main salon electric panel. Functional.

AC ELECTRICAL POWER OUTLETS

The AC outlets were tested using a EXTECH Instruments UL Listed Circuit Tester.

GFCI protected outlets were additionally tripped at their test buttons, where sighted. All GFCIs and GFCI protected outlets were tested satisfactory unless specifically noted.

Outlet locations: below the master stateroom berth; in the head cabinet; in the galley behind the coffee pot; cockpit.

AC ELECTRICAL OUTLET POLARITY

A reverse polarity indicator is installed.

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

FINDING C-5

AC SYSTEM WIRING TYPE

Stranded copper boat cable size and rating, where sighted, appears correct and serviceable for intended use.

AC ELECTRICAL/WIRING COMMENTS (ABYC E-11)

AC wiring is properly terminated. No wire nuts or loose connections sighted.
All sighted wiring appeared to be secured every 18" per ABYC and NFPA recommendations.

COMMENTS

The AC grounding to the DC negative bus as recommended in ABYC Standard E-11, AC & DC Electrical Systems on Boats, was verified.

GENERATORS/AUXILIARY POWER

GENERATORS

GENERATOR MODEL

Cummins 11.5MDK8M-1401E, serial number J090033838, installed in sound box.

GENERATOR SPEC

Spec: E.

GENERATOR FUEL TYPE

Diesel

NUMBER OF CYLINDERS

Four (4)

GENERATOR KILOWATT RATING

11.5 KW

GENERATOR STARTER VOLTAGE RATING

12 volts

GENERATOR HOURS

187.2 hours observed on the generator mounted hour meter.

GENERATOR LABELS & NOTICES

Appropriate labels were installed.

GENERATOR OIL LEVEL

Oil level was normal on the generator's oil sump dipstick.
A oil sample was taken at the time of this inspection with engine warm.
Sample was sent to ALS Tribology testing lab in Portland, OR.
The oil sample was good with "No action required" recommendation.
See results at the end of this report. Follow recommendations of fluid analysis.

GENERATOR COOLING SYSTEM TYPE

Closed coolant with raw water exhaust type.

GENERATOR COOLANT LEVEL

The generator coolant recovery expansion tank's level was normal.
A coolant sample was taken at the time of this inspection with engine warm.
Samples were sent to ALS Tribology Laboratory testing lab in Portland, OR.
The coolant sample was good with "No action required" recommendation.
See results at the end of this report. Follow recommendations of fluid analysis.

GENERATOR EXHAUST SYSTEM

Raw water cooled with fiberglass water-lift type muffler.

GENERATOR LOAD TEST INFORMATION

Generator was operated during underway demonstration.
Generator output was recorded at 120 volts. Various AC loads were cycled during the sea trial.
These included but were not limited to any installed air conditioner unit(s) and galley equipment. Generator was able to support loads unless otherwise noted.

PROPULSION & MACHINERY SPACE

PROPULSION SYSTEM

ENGINE MODEL

Twin, Cummins Marine QSB 480 HO P 5.9 Liter (359 CID), turbocharged & aftercooled with airseps.

MANUFACTURE DATE

Both engines were manufactured 10-01-09 per manufacturer data tags on engines.

ENGINE HORSEPOWER

480 horsepower each @ 3,400 RPM.

NUMBER OF CYLINDERS

Six (6) in-line configuration.

ENGINE STARTER VOLTAGE RATING

12 Volt.

ENGINE HOURS

Port: 650.21 Starboard: 649.33, observed on the SmartCraft display's digital hour meters.

ENGINE SERIAL NUMBERS

Port: 73[redacted]
Starboard: 73[redacted]

ENGINE DISPLAYS

Cummins Marine SmartCraft VesselView Digital Monitoring Display. Appeared to be functional.

ENGINE INSTRUMENTATION

Main engine instrument gauges were installed at the helm. Volt, temperature, oil pressure, RPM and fuel.

ENGINE ALARM SYSTEM

Cummins SmartCraft DieselView Digital Monitoring System (audible/visual). Audible shutdown alarm was tested and is functional.

MAIN ENGINE COOLANT

Both of the engine's coolant recovery expansion tanks were low.
A coolant sample was taken at the time of this inspection with engine warm.
Samples were sent to ALS Tribology Laboratory testing lab in Portland, OR.

See detailed analysis at the end of this report. Follow recommendations of fluid analysis.

FINDING C-6 **FINDING C-7**

ENGINE EXHAUST SYSTEM

Raw water-cooled exhaust headers.
Raw water-cooled exhaust mixing risers and flexible hoses to surge pipes, exiting through Zeus pod drive discharges with above waterline bypass discharges.
An exhaust high temperature alarm is installed. Not tested.

MUFFLER SYSTEM

Fiberglass waterlift.

THROTTLE & SHIFT CONTROLS

Cummins Marine SmartCraft DTS (Digital Throttle & Shift System). Demonstrated satisfactory.

ENGINE SYNCHRONIZER

Cummins Marine SmartCraft Electronic Synchronization. Demonstrated.

EMERGENCY ENGINE SHUT-DOWN

Engine shut-down buttons at the helm. Demonstrated.

ENGINE SPACE WIRING

All sighted wiring appears to meet ABYC Standards.

ENGINE BED MOTOR MOUNTS

Adjustable motor mounts on cored fiberglass longitudinal engine bed stringers. Engine mounts appear to be well secured to the support stringers.

ENGINE BED SUMPS

Pads in place to catch fluid drippings.

MAIN ENGINE OIL

Normal levels were observed on the engine sump dipsticks.
Oil samples were taken at the time of this inspection with engines warm.
Sample was sent to ALS Tribology testing lab in Portland, OR.
Oil samples on both engines were "NORMAL" with recommendation to resample at next interval to monitor and establish wear trend.
See results at the end of this report. Follow recommendations of fluid analysis.

ENGINE ZINC ANODES

Anodes have at least 50% material left.
These anodes should be inspected every 6 months and replaced when 50% consumed.

Note: The following anodes could not be checked due to limited access: port engine upper after cooler, starboard engine heat exchanger.

FINDING C-8

ENGINE GROUND CONDUCTOR

Engines are properly grounded together with a proper size conductor cable.

COMMENTS

It is good practice when buying a used vessel that all fluids (Engine and Transmission) be changed, and the raw water-cooling impeller(s) also be changed unless the present owner can provide written documentation that said maintenance has been recently performed.

MACHINERY & BILGE SPACE EQUIPMENT

ENGINE SPACE VENTILATION

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

ENGINE ROOM AIR BLOWERS

Powered up.

SEA VALVES

Bronze seacock ball valve(s) installed, servicing the engines, generator, air conditioner raw water intakes, and holding tank discharge.

FINDING C-9

RAW WATER STRAINERS

AG Bronze alloy with sight glass (engine, generator & air conditioner raw water).
All sea strainers are clear of debris.

HOSES

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

FINDING B-2

HOSE CLAMPS

Double clamped where sighted, except where noted. Always 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 TRANSFER SYSTEM

Reverso 12-volt oil change system. Not tested.

MACHINERY SPACE WATER SUPPLY

A freshwater hose connection was located in the engine room. Not tested.

TRANSMISSIONS / GEARS / DRIVES

DRIVE SYSTEM TYPE

Internal gears with external Zeus pod drives.

TRANSMISSIONS/GEARS

ZF Hurth Marine Gear, ZF 105 S - 1.4 - E.
Normal levels were observed on the transmission dipsticks.

GEAR RATIO

iA = 1.39 iB = 1.39

DRIVES

Mercury Marine Zeus Pod Drives, model 5 - P4AZ54JH (port) & 5 - Q4AZ54JH (starboard).
Serial numbers: Port: 0M963819 Starboard: 0M963786

GEAR SERIAL NUMBERS

Port: 13115 U
Starboard: 13114 U

GEAR COOLERS/HEAT EXCHANGERS

Raw water heat exchangers.

GEAR FLUID LEVEL

Normal levels were observed in the gear box and POD oil reservoirs.
Oil samples were taken at the time of this inspection at the completion of the underway demonstration.
Samples were sent to ALS Tribology testing lab in Portland, OR.

See detailed results at the end of this report. Follow recommendations of fluid analysis.

FINDING B-3 **FINDING C-10** **FINDING C-11**

UNDERWAY DEMONSTRATION

ENGINE STARTUP

The engines started without excessive cranking or excessive exhaust smoke.

EXHAUST SMOKE

The engine(s) exhaust smoke was minimal and appeared normal throughout the sea trial.

COOLING WATER

The cooling water exhaust appeared adequate and normal.

VIBRATION COMMENTS

No significant hull or running gear vibrations were observed while underway.

ENGINE BACKDOWN TEST

The engine motor mounts were observed while the engines were placed in forward & reverse gear several times under load without exception.

ENGINE CONTROL STATION OPERATION

The engine controls and joystick controller were operated at the helm station without exception.
The throttles operated normally/smoothly.

STEERING TEST

The steering system operated normally/smoothly from stop to stop.

TRANSMISSION(S)

The transmissions operated normally/smoothly.

LEAKS

There were no significant oil, coolant or other leaks observed during the engine operation.

ENGINE PERFORMANCE

Port = START UP/IDLE: 601 SLOW: 1509 CRUISE: 2953 WOT: 3363
Stbd = START UP/IDLE: 603 SLOW: 1532 CRUISE: 2897 WOT: 3400

Manufacturer' s recommended max RPM is 3400.

Engine performance was considered SATISFACTORY given load and sea state conditions.

NOTE: Engine(s) were under load when tested (vessel was underway).

ENGINE LOAD

Port = START UP/IDLE: 33% SLOW: 47% CRUISE: 99% WOT: 99%
Stbd = START UP/IDLE: 13% SLOW: 49% CRUISE: 70% WOT: 99%

OIL PRESSURE

Port = START UP/IDLE: 18.85 PSI SLOW: 43.79 PSI CRUISE: 34.74 PSI WOT: 38.97 PSI
Stbd = START UP/IDLE: 17.01 PSI SLOW: 47.43 PSI CRUISE: 47.01 PSI WOT: 43.18 PSI

ENGINE OIL TEMPERATURE

Port= START UP/IDLE: 247.28 SLOW: 249.08 CRUISE: 252.86 WOT: 256.28
Stbd= START UP/IDLE: 244.4 SLOW: 252.32 CRUISE: 253.58 WOT: 256.48

FUEL FLOW RATE

Port = START UP/IDLE: 0.09 GPH SLOW: 5.05 GPH CRUISE: 24.33 GPH WOT: 2547 GPH
Stbd = START UP/IDLE: 0.58 GPH SLOW: 5.2 GPH CRUISE: 17.78 GPH WOT: 25.65 GPH

COMMENTS

The engine instruments all operated within normal operating limits at idle, cruising speed, and maximum throttle.

All above readings of instruments were within normal range unless otherwise specified. Temperatures shown are in Fahrenheit.

Parameters for both engines were monitored utilizing DIESEL LAPTOP software which connects directly to the respective engine ECM. Readings were reviewed after the underway demonstration for any abnormalities and any OUT OF SPECIFICATION (OOS) readings, if any, are noted in the appropriate section(s) of this report.

STEERING SYSTEMS

STEERING SYSTEM TYPE

Electro-Hydraulic.

STEERING SYSTEM MANUFACTURER

Mercury Marine Zeus.

NUMBER OF STEERING STATIONS

One (1) helm station at the bridge.

STEERING HOSES/LINES

Reinforced flexible hoses with metallic fittings. No leaks sighted.

FUEL SYSTEMS

FUEL SYSTEM TYPE

Diesel

FUEL TANK MATERIAL

5052 Aluminum H32 TEMP

NUMBER OF FUEL TANKS

Two (2)

FUEL TANKAGE CAPACITY

146 gallons per tank.

FUEL LEVEL MONITORING

Fuel gauges installed at the helm station. Fuel gauges integrated into the Smartcraft VesselView display.

FUEL TANK MANUFACTURER LABELING

The ABYC recommended fuel tankage labels were sighted on the fuel tanks.

FUEL TANKAGE SECURING

Aluminum straps with chafe protection.

FUEL TANKAGE LOCATION

Port & starboard, forward in the outboard engine room.

FUEL FILL LOCATION

Port & starboard transom, marked for diesel.

FUEL TANK VENTILATION

Port & starboard hull sides.

FUEL TANKAGE & FUEL FILL GROUNDING

The fuel tank fill fittings were grounded.

FUEL FILL HOSE/PIPE
Type A2 USCG approved fuel hoses, where sighted.

FUEL LINES/HOSES
USCG Approved Type A1 fuel lines, where sighted. No cracks, soft spots or splitting sighted. Serviceable.

FUEL SHUT-OFF VALVES
Ball valves at the fuel tanks.

MAIN ENGINE PRIMARY FUEL FILTERS
Two (2) Racor 900-MA Primary fuel filter/water separators for the main engines.
Heat shields installed per ABYC Standard H-33.

MAIN ENGINE SECONDARY FUEL FILTERS
Engine mounted secondary fuel filters.

GENERATOR PRIMARY FUEL FILTERS
Racor 500-MA fuel filter/water separator.
Heat shield installed per ABYC Standard H-33.

FUEL FILTER CONDITION
No significant sediment or algae was observed in the primary fuel filter's sight bowls or on their diffusers. Monitor/service often.

GENERATOR FUEL FILTER CONDITION
No significant sediment was observed in the generator primary fuel filter's sight bowl or on its diffuser. Monitor and service often.

FUEL COOLERS/HEAT EXCHANGERS
Engine mounted heat exchangers/coolers.

FUEL TRANSFER SYSTEM
12-volt electric fuel transfer pump. Not tested.

FUEL FLOW RATE SYSTEM
Cummins Marine SmartCraft VesselView Display included fuel flow rate data.

WATER SYSTEMS

FRESHWATER SYSTEM

WATER TANKAGE MATERIAL
Polyethylene

NUMBER OF FRESHWATER TANKS
One (1)

WATER TANKAGE CAPACITY
Reportedly, 70 gallons (per Power Boat Guide).

WATER TANKAGE SECURING
The water tankage was well secured where sighted.

WATER TANKAGE LOCATION
Centerline under cabin sole.

WATER FILL LOCATION
Starboard forward side deck, marked for water.

FRESHWATER TANKAGE VENTILATION
Starboard hull side, below the fill pipe.

FRESHWATER PUMPS
Flojet 12-volt demand type freshwater pump. Tested satisfactory as pump holds pressure.

FRESHWATER FILTRATION

Inline strainer at the freshwater pump. Monitor & clean often.

FRESHWATER PIPE/HOSE PLUMBING

Red & blue plastic PEX type (Cross-linked Polyethylene) tubing, with water manifold system.

WATER LEVEL MONITORING

Water level monitor installed at the DC panel. Appears functional.

CITY WATER/DOCKSIDE INLET CONNECTION

Dock-side hose connection in transom locker.

NOTE: Be sure that dockside water pressure is turned off when the boat is unoccupied for any length of time. A burst hose or other water system malfunction could cause serious damage to the vessel or possibly sink the vessel at its assigned slip.

COMMENTS

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

HOT WATER SYSTEM

WATER HEATER

Atwood Mobile Products model EHM11-SM, serial number 9388301100213, manufactured 09/28/09. Powered up. Demonstrated.

WATER HEATER TYPE

Marine Grade 120 volt, with heat exchanger coil.
Heat exchanger hoses not connected.

WATER HEATER CAPACITY

10.5 gallons

WATER HEATER PRESSURE RELIEF VALVE

Relief valve at the tank. Drains overboard.

COMMENTS

Recommend monitoring the water heater, as it is generally known that they can fail internally without warning.

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).

TANK LEVEL INDICATION

Tank level monitor installed at the DC panel. Appears to be functional.

BLACKWATER TANKAGE

Polyethylene Blackwater (sewage) holding tank with 42-gallon capacity per attached label.

BLACKWATER TANKAGE VENTILATION

Starboard hull side.

BLACKWATER SYSTEM DISCHARGE

Deck pump-out fitting only.

GREYWATER SYSTEM

COMMENTS

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.

SAFETY EQUIPMENT

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

WEARABLE PERSONAL FLOATATION DEVICES (33 CFR 175)

Four (4) adult size Type III USCG floatation aid stored in cockpit bench locker.
One (1) child size Type III USCG floatation aid stored in cockpit bench locker.

All appear to be in good condition.

Wearable life jackets must be readily accessible. You should be able to put them on in a reasonable amount of time in an emergency (vessel sinking, on fire, etc.). They should not be stowed in plastic bags, in locked or closed compartments, or have other gear stowed on top of them.

NOTE: Floatation aid vests (ski vests), while USCG approved, are NOT RECOMMENDED for use in an emergency. This style of PFD is not designed to keep an occupant's head out of the water should they become incapacitated.

FINDING A-1

THROWABLE PERSONAL FLOTATION DEVICES (33 CFR 175)

None sighted.

FINDING A-2

FIRE EXTINGUISHERS (46 CFR 25)

One (1) Type BC-I 2.5 lb. dry chemical located in cockpit locker below the sink. (2012)
One (1) Type BC-I 2.5 lb. dry chemical located in the galley below the sink. (2012)

FINDING B-4 **FINDING B-5**

VISUAL DISTRESS SIGNALS (33 CFR 175.101)

None sighted.

FINDING A-3

SOUND PRODUCING DEVICES (33 CFR 83)

12 Volt DC electric air horn. Tested satisfactory.

NAVIGATION LIGHTS (33 CFR 83)

All navigation lights illuminated when tested.

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

Found properly displayed.

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

Found properly displayed.

CO WARNING STICKER

CO warning placard is in place per Wash. State law RCW88.02.250.

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

To be provided separate from this report.

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

The USCG International and Inland Navigation Rule Handbook was not observed onboard.

FINDING A-4

COMMENTS

Fire extinguishers should be permanently mounted and readily available using the mounting system for the brand chosen.

This surveyor recommends that all onboard PFDs be marked with either the vessel name or a point of contact.

AUXILIARY SAFETY EQUIPMENT

FIXED FIRE SUPPRESSION SYSTEM

FE-241 fixed fire suppression bottle in the engine compartment. Automatic thermal and manual activation, with override switch.

NOTE: This system by design should shut down running engine(s), running generator (if installed) and engine compartment blowers when activated. Once the fire is out, system can be reset, and engine(s) restarted. It is highly recommended that when system is next inspected that technician demonstrates functionality.

FINDING B-6

BILGE HIGH WATER ALARMS

One (1) Johnson, 12-volt bilge pump with float switches located forward bilge, serves as high water alarm. Alarm sounds when float switch is raised, and pump is activated.

One (1) Johnson, 12-volt bilge pump with float switches located aft engine compartment bilge, serves as high water alarm. Alarm sounds when float switch is raised, and pump is activated.

FIRST AID SUPPLIES

None sighted. Highly recommend a full Medical Kit and the periodic renewal of any outdated medical supplies.

CARBON MONOXIDE DETECTORS (ABYC A-24)

One (1) Fireboy Xintex CO Sentinel carbon monoxide detector in the master stateroom.
One (1) Fireboy Xintex CO Sentinel carbon monoxide detector in the main salon.
One (1) Fireboy Xintex CO Sentinel carbon monoxide detector in the aft media room.
All detectors tested satisfactory.

NOTE: CO detectors have a specific service life. See manufacturer labeling for details on when detector(s) should be replaced.

SMOKE DETECTORS (NFPA 302)

None sighted.

FINDING B-7

VESSEL FIRE ALARM SYSTEM

SEA-FIRE automatic fire extinguisher indicator. Appears to be functional.

SEARCH LIGHT

ACR Electronics RCL-100D Search Light with ACR remote controller. Powered up. Demonstrated.

BILGE PUMPING SYSTEMS

ELECTRIC BILGE PUMPING SYSTEMS

Two (2) Johnson 2000, 12-volt bilge pumps with float switches located in the engine compartment, one (1) forward & one (1) aft.

The aft pump power up with its manual switch at the helm and float switches turns the pump on. Switch illuminate when pumps is activated manually and with the float switch as recommended by ABYC.

FINDING B-8

TENDER / TRAILER

TENDER/WATERCRAFT

Apex rigid fiberglass bottom inflatable RIB, model A-11 R.I.B.

HIN (HULL IDENTIFICATION NUMBER)

ABL4155C616

A true digital photograph of the hull ID number of the referenced vessel is shown here.

ENGINE MODEL

Tohatsu 20 HP Four Stroke Outboard, model 3BJ(MFS20D), serial number 055201AE.

Outboard was started briefly with the only issue being a dead battery.

FINDING C-12

TENDER EQUIPMENT

GARMIN echo MAP DV depth sounder/fish finder. Not tested.

VESSEL DOCUMENTATION

DOCUMENTATION COMPLIANCE (46 CFR 67)

The vessel's USCG documentation number was not permanently displayed.

FINDING A-5

All systems and components inspected and described herein are considered serviceable and/or functional except as indicated in the survey report and recommendations section. Electronic devices and instruments were checked for power up only - not for functionality. If a component is not identified in this report, it was not inspected. It is the nature of marine vessels that deterioration, wear and accidents do occur and as such, this report therefore represents the condition of the vessel only at the time the survey was conducted.

"SAFETY & REGULATORY FINDINGS" may be in violation of Code of Federal Regulations (CFRs), ABYC Voluntary Safety Standards & Recommended Practices or NFPA Codes & Standards. Safety items 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. Regulatory items not corrected in a timely manner may result is fines from the USCG for non-compliance.

Recommendations noted under "ABYC RECOMMENDATIONS & HIGH PRIORITY MAINTENANCE" are related to higher priority maintenance items and ABYC Standards findings. These 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 it's value.

Recommendations noted under "SURVEYOR'S GENERAL FINDINGS AND OBSERVATIONS" are lower priority or cosmetic findings, that are relatively minor in nature, usually general maintenance items which should be addressed in keeping with good marine maintenance practices and in some cases as a desired upgrade.

Recommendations will be listed under the appropriate heading:

A. SAFETY & REGULATORY RECOMMENDATIONS

B. ABYC RECOMMENDATIONS & HIGH PRIORITY MAINTENANCE

C. SURVEYOR'S NOTES & OBSERVATIONS

A: SAFETY & REGULATORY

FINDING A-1 **WEARABLE PERSONAL FLOATATION DEVICES (33 CFR 175)**

There were no Type I, II, or III Personal Flotation Devices observed onboard the vessel.

RECOMMENDATION

Provide Approved Personal Flotation Devices for each person onboard to comply with USCG Safety Regulations.

FINDING A-2 **THROWABLE PERSONAL FLOTATION DEVICES (33 CFR 175)**

There was no Type IV throwable PFD observed onboard. All vessels 16 feet or more require at least one USCG approved Type IV PFD (throwable device) per 33 CFR Section 175.15.

RECOMMENDATION

Provide at least one Type IV throwable PFD onboard to comply with 33 CFR.

FINDING A-3 **VISUAL DISTRESS SIGNALS (33 CFR 175.101)**

There were no visual distress signals observed onboard. 33 CFR 175.110 Visual distress signals required.
(a) No person may use a boat 16 feet or more in length, or any boat operating as an uninspected passenger vessel subject to the requirements of 46 CFR chapter I, sub-chapter C, unless visual distress signals selected from the list in §175.130 or the alternatives in §175.135, in the number required, are onboard. Devices suitable for day use and devices suitable for night use, or devices suitable for both day and night use, must be carried.

RECOMMENDATION

Provide current dated visual distress signals to comply with the CFRs.

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

A USCG International and Inland Navigation Rules Handbook was not observed onboard. This official government rule book is recommended to be on vessels 12M or 39'4" and larger. Also known as Nav-Rules CG169, it contains the International Regulations for Preventing Collisions at Sea, 1972 (72 COLREGS).

RECOMMENDATION

Provide the latest version of the Navigation Rulebook.

FINDING A-5 **DOCUMENTATION COMPLIANCE (46 CFR 67)**

The vessel's USCG documentation number was not displayed onboard.

RECOMMENDATION

Properly display USCG Documentation number and decal for compliance. The vessel must have the official documentation number permanently affixed in block-type Arabic numerals of not less than 3 inches in height, preceded by the letters "NO ." on some clearly visible interior integral structural part of the vessel. The number must be permanently affixed so that alteration, removal or replacement would be obvious and cause some scarring or damage to the surrounding hull area.

B: ABYC RECOMMENDATIONS & HIGH PRIORITY MAINTENANCE

FINDING B-1 **BOARDING SWIM LADDER**

Boarding ladder does not comply with current ABYC Standards. ABYC Standard H-41 REBOARDING MEANS, LADDERS, HANDHOLDS, RAILS AND LIFELINES - JULY 2009 41.9 REBOARDING MEANS 41.9.1 Means of unassisted reboarding shall be provided on all boats, and must be accessible to, or deployable by, the person in the water. Present configuration has the dinghy in the way of deploying the boarding ladder.

RECOMMENDATION

Re-configure boarding ladder in a location in order to comply with ABYC Standards.

FINDING B-2 **HOSES**

The generator raw water hose at the raw water strainer outlet has deposits from leaking.

RECOMMENDATION

Replace the hose with reinforced "non-collapsible" type.

Findings & Recommendations

FINDING B-3 **GEAR FLUID LEVEL**

Port POD - All wear levels appear within acceptable limits for first sample. Concentration of water at a severe level. Sodium level (possible saltwater residue or from operational environment) elevated. Unable to obtain accurate viscosity result at 40C due to excessive water in sample.

RECOMMENDATION

Action: Check for source of water entry. Change oil if not already done. Resample after corrective action to further monitor.

Surveyor comments - Zeus POD manufacturer allows for up to 1% water contamination. Drain and renew oil. Have pod inspected and serviced.

FINDING B-4 **FIRE EXTINGUISHERS (46 CFR 25)**

The hand-held fire extinguishers did not have current annual inspection tags.

RECOMMENDATION

Have the fire extinguishers inspected and re-certified to comply with ABYC and NFPA recommended standards for fire protection.

FINDING B-5 **FIRE EXTINGUISHERS (46 CFR 25)**

USCG standards for vessels 40 feet and over, but not over 65 feet requires three (3) BI extinguishers when a fixed fire extinguishing systems is installed in the machinery space. ABYC A4.6.3 and NFPA 10.2.1 recommend four (4) extinguishers: one (1) outside the engine compartment, one (1) at steering position, one (1) in the crews' quarters and one (1) near the galley or passenger cockpit. NOTE: On vessels with a galley stove, one of the required extinguishers shall be readily accessible thereto.

RECOMMENDATION

Install recommended/required portable fire extinguishers.

FINDING B-6 **FIXED FIRE SUPPRESSION SYSTEM**

The fixed fire suppression system did not have a current annual inspection tag.

RECOMMENDATION

Have the system inspected and re-certified to comply with ABYC and NFPA recommended standards for fire protection.

FINDING B-7 **SMOKE DETECTORS (NFPA 302)**

An operational Smoke Detector was not observed onboard the vessel. NFPA 12.3 Smoke Detection - All vessels 26 ft. (8m) or more in length with accommodation spaces intended for sleeping shall be equipped with a single station smoke alarm that is listed to UL 217, Standard for Single and Multiple Station Smoke Alarms, for recreational vehicles and is installed and maintained according to the manufacturer' s instructions

RECOMMENDATION

Install a smoke detector onboard.

FINDING B-8 **ELECTRIC BILGE PUMPING SYSTEMS**

The forward engine room's bilge pump did not power up when tested with its float switch. The visual indication of power applied to the forward engine compartment bilge pump is not functional. A s recommended in ABYC H-22, "22.8.14 Pumps with automatic controls shall be provided with a visual indication that power is being supplied to the pump."

RECOMMENDATION

Troubleshoot and repair or replace as required to prove functional.

C: SURVEYOR'S NOTES & OBSERVATIONS

FINDING C-1 **DOCUMENTATION DIMENSIONS**

Documented dimensions do not match those listed in Power Boat Guide reference book.

RECOMMENDATION

Client is advised to verify vessel dimensions if renewing USCG documentation.

FINDING C-2 **BILGE LIMBER HOLES**

Some of the engine compartment limber holes were clogged with debris.

RECOMMENDATION

Clear the limber holes to allow proper drainage.

FINDING C-3 **PORTHOLES**

Some corrosion was sighted at the media room portholes.

RECOMMENDATION

Remove corrosion and monitor for leakage. Repair as required.

Findings & Recommendations

FINDING C-4 **WATER INTRUSION COMMENTS**

Slight water incursion signs (stains) were observed under the portholeslocated port & starboard sides of the " media area" of the main salon.

RECOMMENDATION

Identify source of leak (Port light frame seal or inside window seal) and repair as necessary to prevent water intrusion inside vessel.

FINDING C-5 **AC ELECTRICAL OUTLET POLARITY**

The polarity indication at the main AC panel did not appear to be functional. The "GREEN" light was not illuminated with shore power being supplied to the vessel.

RECOMMENDATION

Troubleshoot and repair as required to prove functional.

FINDING C-6 **MAIN ENGINE COOLANT**

Both of the engine's coolant recovery expansion tanks were nearly empty.

RECOMMENDATION

Fill reservoirs with adequate coolant and monitor.

FINDING C-7 **MAIN ENGINE COOLANT**

Port & Starboard - Hazy, possible particulate contamination. pH level is normal. Glycol level is normal.

RECOMMENDATION

Advise change filter(s). Recommend take corrective action and resample to monitor.

Surveyor comments: Consider draining, flushing and renewing coolant.

FINDING C-8 **ENGINE ZINC ANODES**

Zinc plugs appear to have anti-seize compound tape on their threads. This has to the potential to "insulate" the plug and zinc anode from the heat exchanger/cooler assembly.

RECOMMENDATION

Remove anti-seize compound from plug threads.

FINDING C-9 **SEA VALVES**

All sea cocks were difficult to operate.

RECOMMENDATION

Cycle valves SHUT to OPEN several times. If stiffness persists, service all sea cocks and prove operational.

FINDING C-10 **GEAR FLUID LEVEL**

Port & starboard transmissions - Bearing/bushing/thrust washer/clutch pack/bronze gear wear indicated. Silicon level (dirt/sealant material) satisfactory. Water content acceptable.

RECOMMENDATION

Action: Check for any abnormal noise, vibration, or poor performance. Resample after corrective action to further monitor.

Surveyor comments - This is usually indicative of old oil. Drain and renew oil. Resample per lab recommendation.

FINDING C-11 **GEAR FLUID LEVEL**

Starboard POD - Bearing/gear wear indicated. Light concentration of water present. Silicon level (dirt/sealant material) satisfactory. Please provide missing oil information; we need manufacturer, type, and grade to evaluate the oil data.

RECOMMENDATION

Action: Check for source of water entry. Advise water drain off/offline purification. Resample after corrective action to further monitor.

Surveyor comments - Surveyor comments - Zeus POD manufacturer allows for up to 1% water contamination. Drain and renew oil. Have pod inspected and serviced.

FINDING C-12 **ENGINE MODEL**

Dinghy battery was dead.

RECOMMENDATION

Recharge battery. If battery does not hold charge over a reasonable amount of time, replace batteyr.

SURVEY INSPECTION AND REPORT LIMITATIONS

The report herewith reports the overall condition of the above-described vessel at the time of survey to the best of the undersigned's ability by examining and testing the vessel's accessible areas, systems, and accessories by non-destructive ultrasonic testing, probing, and visual inspection: without taking borings, removing all hull fastenings, testing for water leakage inside the hull or at through-hull fittings, or operating machinery.

The services rendered herein and the report furnished herewith are done with the specific understanding that the undersigned and or CWS Maritime Services, LLC will not be held responsible under any and all circumstances for any and all errors, omissions, or failure to properly perform the requested services as set forth above, as it concerns the vessel described herein, all matters and statements contained herewith constitute statements of opinion only and not to be construed as representations, warranties, or guarantees and that, any and all statements made herein or in connection herewith will not be used for the basis of any claim, demand, or action against the undersigned. The request for services and the report herewith shall be construed to be an acceptance of the above conditions. Any and all claims for damages of what-so-ever nature asserted against the undersigned are limited to refund of the entire cost of the survey.

The survey and report herein is given without prejudice to the questions of rights, interests, and or liabilities on the part of any and all persons concerned.

SUMMARY

GENERAL COMMENTS

1 Further Inspections and Repairs: When further inspections and repairs are recommended, they should be made to the current Federal Regulations and/or professional marine industry standards by competent professional and qualified craftsmen, and when applicable, to any manufacturer's recommendations. A prudent purchaser would obtain additional inspections and estimates for repairs for consideration in the course of a purchase.

2 Through Hull Valves and Hoses: It is the undersigned' s opinion and recognized as prudent practice, that all the below the-waterline through hull valves, with the exception of the cockpit drains, be closed while the vessel is left unattended, dockside or at anchor. Further, any discharge hoses which discharge near or beneath the waterline should be secured in such a way that if the hose clamps fail at any point of attachment above the thru-hull, the hose would remain above the waterline so as to avoid down-flooding risk.

3 Carbon Monoxide / Smoke Alarms: Carbon Monoxide detectors are recommended for all boats with enclosed accommodation spaces. Although diesel exhaust does not normally have CO concentration as high as gasoline exhaust, diesel exhaust does produce dangerous levels of CO. Other sources of dangerous amounts of CO are; any open-flame equipment (i.e. stove; as well as nearby boats running generators). This is especially true of boats running air conditioning. Marine CO monitor/alarms meeting the requirements of ABYC A-24, Carbon Monoxide Detection Systems on boats are relatively inexpensive and easy to install. Smoke alarms have been proven to prevent injury and death. The undersigned recommends installation of CO DETECTORS and Smoke Alarms on this vessel.

4 Safety Equipment: The Federally Required Safety Equipment reflects the minimum requirement. The ABYC recommends additional quantities of the same equipment. Experience and wisdom of the operator/owner/captain will dictate the additional desired equipment; fire fighting and detection, vapor detection, distress signals, boats or dinghies, recovery and reboarding equipment, throw bags, lighting, ground tackle, first aid, medications and prescriptions, communication devices, and others. A prudent owner/operator would exercise careful consideration in the selection of additional safety equipment suitable for their vessel service and intended use and the needs of those aboard; such as smoke/fire alarms. If the bitter end of the anchor rode was not observed, the anchor chain and rode should be payed out on to the dock, measured, marked and the bitter end and the anchor shackle ends proven securely attached before paying out the anchor at sea. The undersigned recommends a spare anchor and rode be supplied onboard if there are not two anchors of appropriate size for this vessel aboard and at ready.

5 Ship's Papers: It is a good idea to retain original / copies of all important ships papers at a safe shore side location. With the exception of the official papers of which original are required to be retained aboard, i.e.: State Registrations and USCG Official Documentation.

6. Equipment: All equipment should be demonstrated in operable and serviceable condition to the buyers satisfaction, should that not have been fully accomplish due to circumstances at the survey inspection, i.e., outboard motors, equipment not present at the time of the survey but included as part of the sale, etc.

7 Shore-side Pressure Water Connections: Should this vessel be equipped with shore side fresh water connection, the undersigned recommends that the shore water supply be secured in the OFF position at the dock, prior to leaving the vessel unattended to reduce the opportunity for down flooding.

8 Engine Care: It is always a good idea to change all the fluids, the impeller(s), and the belts after buying a used boat. If fluids were not drawn for sampling, wisdom dictates that a base line set of fluid sample reports to compare to future samples can help in the long term care of the engine, and perhaps contribute to its successful performance and longevity.

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 major 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

Report Summary

VALUATION APPROACH

The market method of appraisal was used in determining a current market value.

The vessel was found to be in AVERAGE condition requiring some minor maintenance work to various equipment and fittings to prepare for sale and was exceptionally equipped for her size.

The published values in the latest edition of ABOS used vessel price guide was reviewed. ABOS listed the retail value for a 2010 Sea Ray Sundancer 450 in AVERAGE condition as $454,059.

Prices of recently sold similar vessels from SoldBoats.com were used for comparable pricing. There was only one (1) of this model vessels listed as being sold in the past four (4) years on Sold Boats. The listed selling price was $319,754. The asking price for the vessel was $375,356. The difference between the above Sold Boat listing asking price and sale prices was 85%. The vessel was compared to advertisements of this model and year vessel currently found in places like Yacht World. Applying this percentage to the current listings would bring an expected average sale price of $458,056. It must also be noted that the present local market conditions and lack of used boat inventory is driving sale prices higher than resources currently reflect. This information was considered along with the current condition of the vessel in determining a value.

The vessel's original MSRP was reported by ABOS to have been $856,911. The replacement cost of this vessel with a new vessel of similar type would be approximately $1,215,000 as listed on BUC.

Based on the resources mentioned, it is therefore my professional opinion that the current market value of the vessel and its equipment is approximately $456,000 in its present condition.

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.

Estimated Fair Market Value is determined using a cross reference of data from Soldboats.com, BUC Used Boat Pricing Guides, NADA, Yachtworld.com, other online sales listings or dealers. Adjustments are made for condition and related equipment. The Estimated Market Value is for the vessel in its condition on the date or dates of the Survey, prior to any repairs or maintenance.

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:

$456,000

Four Hundred Fifty-Six Thousand US Dollars

Estimated Replacement Cost is determined using a cross reference of data obtained from Boat Dealers and other online resources.

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. The "ESTIMATED REPLACEMENT COST" of the vessel is:

$1,215,000.00 per BUC

POST FINDINGS NOTE

SURVEY INSPECTION AND REPORT LIMITATIONS

The report herewith reports the overall condition of the above described vessel at the time of survey to the best of the undersigned's ability by examining and testing the vessel's accessible areas, systems, and accessories by non-destructive ultrasonic testing, probing, and visual inspection: without taking borings, removing all hull fastenings, testing for water leakage inside the hull or at through-hull fittings, or operating machinery.

The services rendered herein and the report furnished herewith are done with the specific understanding that the undersigned and or CWS Maritime Services, LLC will not be held responsible under any and all circumstances for any and all errors, omissions, or failure to properly perform the requested services as set forth above, as it concerns the vessel described herein, all matters and statements contained herewith constitute statements of opinion only and not to be construed as representations, warranties, or guarantees and that, any and all statements made herein or in connection herewith will not be used for the basis of any claim, demand, or action against the undersigned. The request for services and the report herewith shall be construed to be an acceptance of the above conditions. Any and all claims for damages of what-so-ever nature asserted against the undersigned are limited to refund of the entire cost of the survey.

The survey and report herein is given without prejudice to the questions of rights, interests, and or liabilities on the part of any and all persons concerned.

Report Summary

SUMMARY

In accordance with the request for a Marine Survey of the "K Squared", 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 Inspected on June 06, 2022 Report written June 14, 2022. 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

I certify that, to the best of my 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 my personal, unbiased professional analyses, opinions and conclusions.

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

My 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.

I 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.

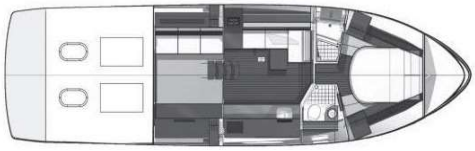
Charles W Solarek

Charles W Solarek, AMS 1161, Y&SC

June 14, 2022

Sea Ray 450 Sundancer

2010–15



Beginning in 2006, pod drive propulsion systems have evolved from a novel engineering concept to a marine industry game changer. Led by Tiara Yachts, builders have begun to introduce new models specifically designed for pod drive power. The 450 Sundancer is one of these new-breed designs, a high-impact sport yacht whose innovative interior offers something different from previous Sundancer models—a media room, complete with 37" TV, leather settee and cocktail tables. Because the Zeus pod drives used in the 450 require less engine room space than traditional V-drive inboards, Sea Ray engineers were able to create a much larger amidships area aft of the salon—space dedicated a second stateroom in previous Sundancer models but now used for the 450's media room. In other respects, the 450 Sundancer follows the pattern of previous Sundancer model introductions: cutting-edge styling, sumptuous accommodations, and yacht-class construction. Features include a hardtop with retractable sunroof, huge cockpit with full-service wet bar, and joystick controls. The entire aft cockpit floor lifts for engine access. Cruise at 25 knots (30+ top) with 364hp Cummins diesels with Zeus drives.

View Resale Values

Length w/Platform	45'5"	Fuel	292 gals.
Beam	13'2"	Water	70 gals.
Draft, Axius Drives	3'2"	Waste	42 gals.
Draft, Zeus Drives	3'10"	Hull Type	Deep-V
Weight, Zeus	27,205#	Deadrise Aft	19°

PriceDigests.

PREPARED ON:
June 14, 2022 - 09:21am

PREPARED BY:

Charles Solarek
CWS Maritime Services, LLC
Everett,
206-225-3045

PREPARED FOR:

[redacted]
,

REVISION DATE:

June 1, 2022

Configuration	MSRP	Low	High	Retail
2010 SEA RAY BOATS 450 SUNDANCER (ZEUS DRIVE)	$856,911	$318,576	$378,419	$454,059
Totals:	**$856,911**	**$318,576**	**$378,419**	**$454,059**

2010 SEA RAY BOATS 450 SUNDANCER (ZEUS DRIVE)

Drive Type: IO
Horsepower: 364 HP
Number of Engines: 2
Engine Type: D
Included Trailer: N
Hull Material: F
MSRP: $819,875
Weight: 24362 Pounds
Length: 45 Feet 5 Inches
Boat Width: 13 Feet 2 Inches

Base Value	MSRP	Low	High	Retail
2010 SEA RAY BOATS 450 SUNDANCER (ZEUS DRIVE)	$819,875	$274,312	$323,962	$386,461
Base Value Adjustment: (+12%)	---	$32,918	$38,876	$46,376
Additional Equipment				
AM/FM/CD Premium Sound System with Multi-Changer CD	$680	$271	$338	$451
Air conditioning with Heat Reverse Cycle	$4,506	$1,794	$2,243	$2,990
Anchor Power Winch	$2,126	$847	$1,058	$1,411
Compass	$75	$30	$38	$50
Diesel Air Separators	$3,142	$1,251	$1,564	$2,085
Dockside Power	$850	$338	$423	$564
Fire Extinguisher Automatic	$279	$111	$139	$185
Hot Water Heater	$391	$155	$194	$259
Hour Meter	$85	$34	$42	$56
Marine Head With Holding Tank	$242	$97	$121	$161

Microwave	$395	$157	$197	$262
Pressure Water System	$594	$236	$296	$394
Refrigerator	$629	$250	$313	$417
Sonar	$340	$136	$170	$226
Spotlight	$382	$152	$190	$253
Synchronizer Dual Engine	$1,533	$610	$763	$1,017
Transom Shower	$156	$62	$78	$104
Vacuflush Toilet	$1,415	$563	$704	$939
User Defined Optional Equipment				
11.5 KW Generator, diesel	$15,000	$3,300	$5,478	$6,600
Adjustments				
Condition: Good	---	$0	$0	$0
Engine Horsepower: 2x 425 - 524 HP	$4,216	$952	$1,232	$2,798
Totals:	**$856,911**	**$318,576**	**$378,419**	**$454,059**

Length	Make/Model	Year	Listed Price	Sold Price	Boat Location
45 ft	Sea Ray 450 Sundancer	2010	US$375,608	US$319,754 (6/2018)	Vancouver, British Columbia, Canada

Chuck Solarek | **CWS Maritime Services, LLC**
2521 117th Place SE, Everett, Washington, United States
Tel: **206-225-3045**
cws@surveyorsforhire.com

CWS MARITIME SERVICES LLC
2521 117PL SE
Everett WA 98208
USA

Coolant Sample Analysis

UIN:	095F0D8	**Site:**	
Compartment:	Cooling System		
Unit No.:	[redacted]	**Description:**	Gen Cooling System
Unit Make:		**Compartment Make:**	
Unit Model:		**Compartment Model:**	
Serial No.:		**CompartmentSerial No.:**	

DATE SAMPLED		06-Jun-22
DATE RECEIVED		10-Jun-22
DATE REPORTED		13-Jun-22
LAB NO.		40111361095
SIF NO.		39455471
COMPARTMENT	Hrs	187
SAMPLE	Hrs	
COOLANT BRAND		Unidentified
COOLANT TYPE		Unidentified
COOLANT CHANGED		Not Changed
WO NUMBER		

TEST/METHOD	UNITS	RESULTS
Visual Appearance		
Clarity		Clear
Petroleum Layer		None
Sediment		None
Color		Blue
Physical / Chemical		
Total Dissolved Solids (D1125)	ppm	840
Freeze Point (D3321 Refractometer)	°F	-40
Glycol Content (D3321)	%	53
Boil Point (D3321)	°F	227
Nitrites (Titrimetric/IC D5827)	ppm	1750
pH (D1287/Meter)		8.7

ANALYST: Susan.Stapleton

DIAGNOSIS:

pH level is normal. Glycol level is normal. Resample at the next scheduled interval.

Normal

LEGEND

Severe | Abnormal | Caution | Normal

Since services are based on samples and information supplied by others, and since corrective actions, if any, are necessarily taken by others, these services are rendered without any warranty or liability of any kind beyond the actual amount paid to ALS Tribology for the services. Reported recommendations are based on interpretations of the generated test results and historical data. Certain test results appearing in this report may have been tested at other ALS laboratories within the Tribology divisional network.

CWS MARITIME SERVICES LLC
2521 117PL SE
Everett WA 98208
USA

Coolant Sample Analysis

UIN: 095F0D9
Compartment: Cooling System
Unit No.: [redacted]
Unit Make:
Unit Model:
Serial No.:

Site:
Description: Port Cooling System
Compartment Make:
Compartment Model:
CompartmentSerial No.:

DATE SAMPLED		06-Jun-22
DATE RECEIVED		10-Jun-22
DATE REPORTED		13-Jun-22
LAB NO.		40111361096
SIF NO.		39455470
COMPARTMENT	Hrs	650
SAMPLE	Hrs	
COOLANT BRAND		Unidentified
COOLANT TYPE		Unidentified
COOLANT CHANGED		Not Changed
WO NUMBER		

TEST/METHOD	UNITS	RESULTS
Visual Appearance		
Clarity		Hazy
Petroleum Layer		None
Sediment		None
Color		Blue
Physical / Chemical		
Total Dissolved Solids (D1125)	ppm	1010
Freeze Point (D3321 Refractometer)	°F	-33
Glycol Content (D3321)	%	49
Boil Point (D3321)	°F	225
Nitrites (Titrimetric/IC D5827)	ppm	1800
pH (D1287/Meter)		8.2

ANALYST: Susan.Stapleton

DIAGNOSIS:

Note appearance: Hazy, possible particulate contamination. pH level is normal. Glycol level is normal. Advise change filter(s). Recommend take corrective action and resample to monitor.

Caution

LEGEND: Severe | Abnormal | Caution | Normal

CWS MARITIME SERVICES LLC
2521 117PL SE
Everett WA 98208
USA

Coolant Sample Analysis

UIN:	095F0DB	**Site:**	
Compartment:	Cooling System		
Unit No.:	[redacted]	**Description:**	Starboard Cooling System
Unit Make:		**Compartment Make:**	
Unit Model:		**Compartment Model:**	
Serial No.:		**CompartmentSerial No.:**	

DATE SAMPLED		06-Jun-22
DATE RECEIVED		10-Jun-22
DATE REPORTED		13-Jun-22
LAB NO.		40111361097
SIF NO.		39455472
COMPARTMENT	Hrs	649
SAMPLE	Hrs	
COOLANT BRAND		Unidentified
COOLANT TYPE		Unidentified
COOLANT CHANGED		Not Changed
WO NUMBER		

TEST/METHOD	UNITS	RESULTS
Visual Appearance		
Clarity		Hazy
Petroleum Layer		None
Sediment		None
Color		Blue
Physical / Chemical		
Total Dissolved Solids (D1125)	ppm	1000
Freeze Point (D3321 Refractometer)	°F	-33
Glycol Content (D3321)	%	50
Boil Point (D3321)	°F	225
Nitrites (Titrimetric/IC D5827)	ppm	1800
pH (D1287/Meter)		8.2

ANALYST: Susan.Stapleton

DIAGNOSIS:

Note appearance: Hazy, possible particulate contamination. pH level is normal. Glycol level is normal. Advise change filter(s). Recommend take corrective action and resample to monitor.

Caution

LEGEND: Severe | Abnormal | Caution | Normal

UIN 095F066

Diesel Engine

Unit No. [redacted]

Unit:
Make
Model
Serial No.

Site

Compartment:
Name Gen Diesel Engine
Make Cummins
Model .
Serial No. J090033838
Capacity: Ltrs

Customer:

CWS MARITIME SERVICES LLC
2521 117PL SE
Everett WA 98208
USA

DIAGNOSIS

All wear levels appear within acceptable limits for first sample. Silicon level (dirt/sealant material) satisfactory. Water content acceptable. Due to lack of information (oil grade) not all tests can be determined. Please provide missing oil information; we need manufacturer, type, and grade to evaluate the oil data. Action: Resample at next recommended interval to monitor and establish wear trend.

ANALYST: Stan.Leitz

Normal

LEGEND

Severe | Abnormal | Caution | Normal

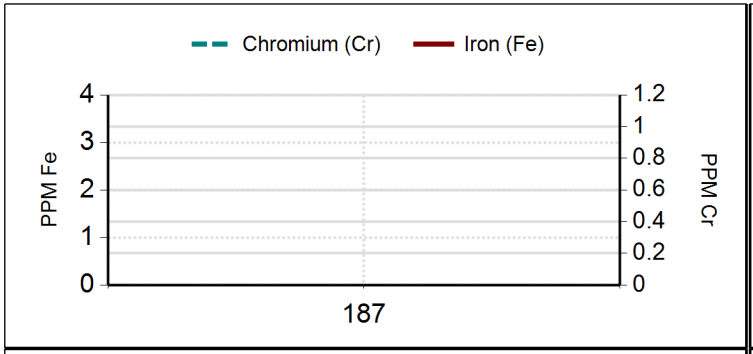
Right Solutions • Right Partner

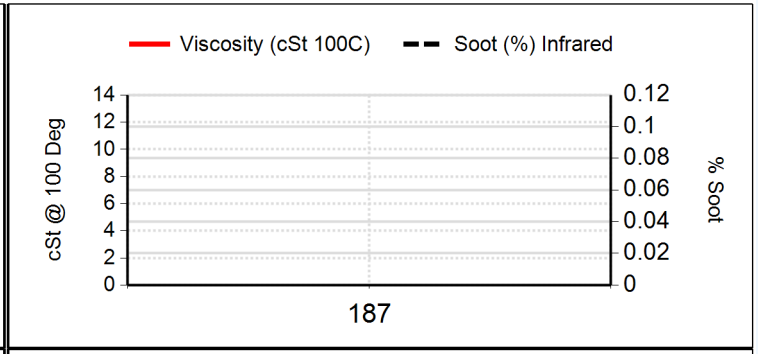
DATE SAMPLED	06-Jun-22
DATE RECEIVED	10-Jun-22
DATE REPORTED	10-Jun-22

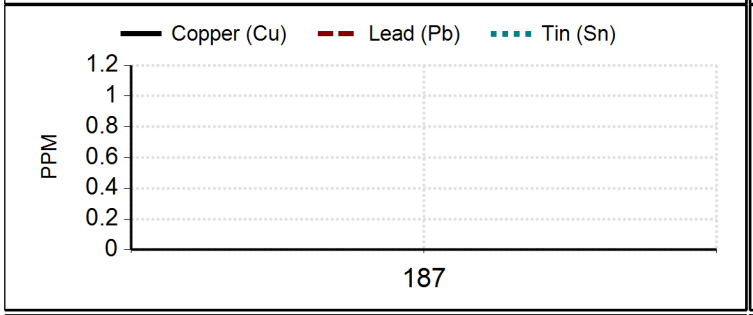
LAB NO.		40111361063
SIF NO.		700040702
TIME ON UNIT	Hrs	187
TIME ON OIL	Hrs	
OIL BRAND		Unidentified
OIL TYPE		Unidentified
OIL GRADE		Unknown
OIL ADDED	Ltrs	0.0
FILTER	Hrs	
OIL CHANGED		Not Changed
WO NUMBER		

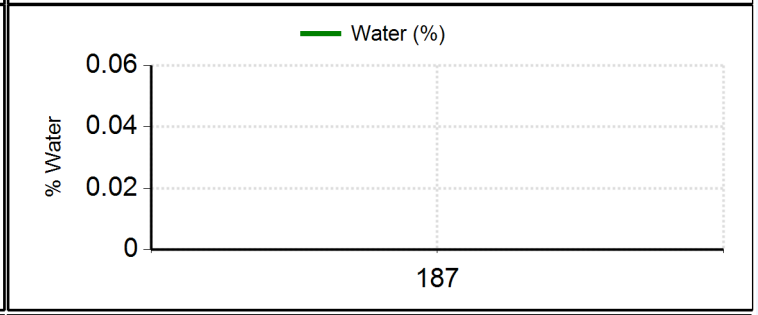
Metals (ppm)	
Iron (Fe)	4
Chromium (Cr)	<1
Lead (Pb)	<1
Copper (Cu)	<1
Tin (Sn)	<1
Aluminium (Al)	1
Nickel (Ni)	<1
Silver (Ag)	<1
Titanium (Ti)	<1
Vanadium (V)	<1
Contaminants (ppm)	
Silicon (Si)	10
Sodium (Na)	3
Potassium (K)	<1
Additives (ppm)	
Magnesium (Mg)	815
Calcium (Ca)	1637
Barium (Ba)	<1
Phosphorus (P)	1034
Zinc (Zn)	1238
Molybdenum (Mo)	58
Boron (B)	75
Contaminants	
Water (%)	<0.05
Coolant	No
Physical Tests	
Viscosity (cSt 100C)	13.9
Fuel (%)	--
PQ Index	<10
Soot (%) Infrared	<0.1

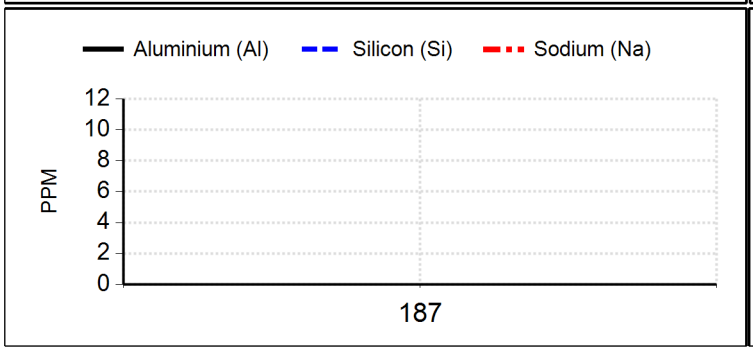
UIN 095F066











Filter Image

Filter patch test is not performed Contact laboratory for more information

Since services are based on samples and information supplied by others, and since corrective actions, if any, are necessarily taken by others, these services are rendered without any warranty or liability of any kind beyond the actual amount paid to ALS Tribology for the services. Reported recommendations are based on interpretations of the generated test results and historical data. Certain test results appearing in this report may have been tested at other ALS laboratories within the Tribology divisional network.

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0002 v1.9

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Brisbane, Perth, Sydney, Muswellbrook

South America
Santiago de Chile, Belo Horizonte, Brazil

New Zealand
Wellington

Southeast Asia
Kuala Lumpur, Singapore

Europe
Prague

TEST METHODS:

Acid Number:	ASTM D974/D664 (*M)
Base Number:	ASTM D4739 (*M)
Base Number (Perchloric):	ASTM D2896 (*M)
Fuel Dilution by GC:	ASTM D7593
Fuel Dilution Visc/Setaflash	In House
Fuel Soot ATR/IR:	ASTM D7686 (*M)
Soot by FTIR:	ASTM D7844
Glycol:	In House
Metals by ICP AES:	ASTM D5185 (*M)
Ox, NOx, SOx, FTIR:	ASTM E2412/D7418/D7414 D7415
PQ Index:	ASTM D8120 (*M)
Particle Count:	ASTM D7647 (*M) / ISO 4406
Viscosity:	ASTM D445 (*M) / D7279 (*M)
Water KF:	D6304 / E203 (*M)
Water Crackle:	In House

*M - Modified Method

UIN 095F067

Diesel Engine

Unit No. [redacted]

Unit:
Make
Model
Serial No.

Site

Compartment:
Name Port Diesel Engine
Make Cummins
Model QSB
Serial No. [redacted]
Capacity: 0.0 Ltrs

Customer:

CWS MARITIME SERVICES LLC
2521 117PL SE
Everett WA 98208
USA

DIAGNOSIS

All wear levels appear within acceptable limits for first sample. Silicon level (dirt/sealant material) satisfactory. Water content acceptable. Due to lack of information (oil grade) not all tests can be determined. Please provide missing oil information; we need manufacturer, type, and grade to evaluate the oil data. Action: Resample at next recommended interval to monitor and establish wear trend.

ANALYST: Stan.Leitz

Normal

LEGEND

Severe | Abnormal | Caution | Normal

DATE SAMPLED	06-Jun-22
DATE RECEIVED	10-Jun-22
DATE REPORTED	10-Jun-22

LAB NO.		40111361064
SIF NO.		700040696
TIME ON UNIT	Hrs	650
TIME ON OIL	Hrs	
OIL BRAND		Unidentified
OIL TYPE		Unidentified
OIL GRADE		Unknown
OIL ADDED	Ltrs	0.0
FILTER	Hrs	
OIL CHANGED		Not Changed
WO NUMBER		

Metals (ppm)	
Iron (Fe)	23
Chromium (Cr)	1
Lead (Pb)	<1
Copper (Cu)	27
Tin (Sn)	<1
Aluminium (Al)	1
Nickel (Ni)	<1
Silver (Ag)	1
Titanium (Ti)	<1
Vanadium (V)	<1
Contaminants (ppm)	
Silicon (Si)	10
Sodium (Na)	4
Potassium (K)	<1
Additives (ppm)	
Magnesium (Mg)	861
Calcium (Ca)	1566
Barium (Ba)	<1
Phosphorus (P)	998
Zinc (Zn)	1209
Molybdenum (Mo)	59
Boron (B)	45
Contaminants	
Water (%)	<0.05
Coolant	No
Physical Tests	
Viscosity (cSt 100C)	14.8
Fuel (%)	--
PQ Index	<10
Soot (%) Infrared	0.3

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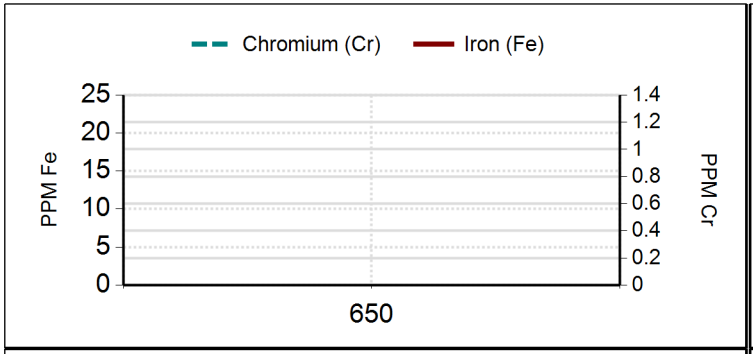
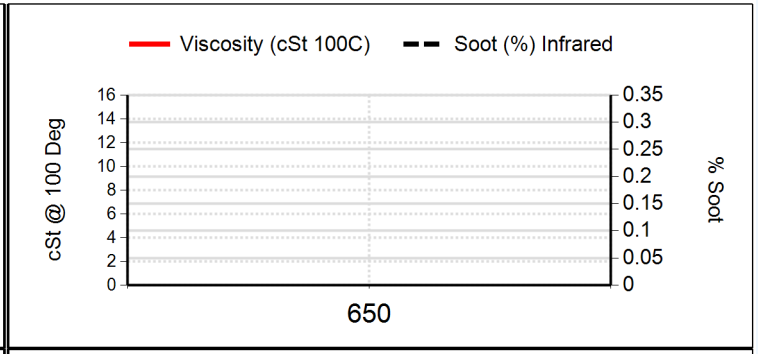
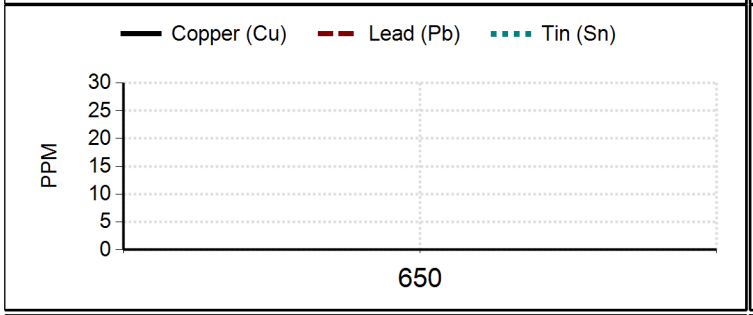
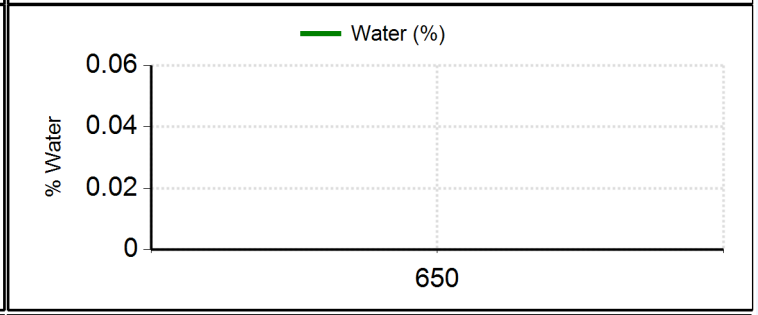
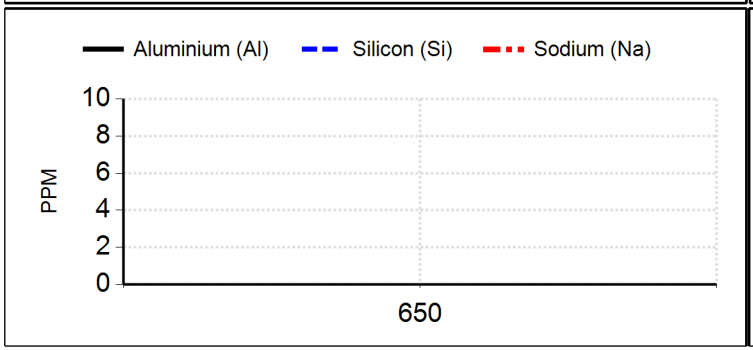
UIN 095F067











Filter Image

Filter patch test is not performed Contact laboratory for more information

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2521 117PL SE
Everett WA 98208
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Glycol:	In House
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Ox, NOx, SOx, FTIR:	ASTM E2412/D7418/D7414 D7415
PQ Index:	ASTM D8120 (*M)
Particle Count:	ASTM D7647 (*M) / ISO 4406
Viscosity:	ASTM D445 (*M) / D7279 (*M)
Water KF:	D6304 / E203 (*M)
Water Crackle:	In House

*M - Modified Method

UIN 095F075

Gearbox

Unit No. [redacted]

Unit:
Make
Model
Serial No.

Site

Compartment:
Name Port Pod
Make
Model
Serial No. [redacted]
Capacity: Ltrs

Customer:

CWS MARITIME SERVICES LLC
2521 117PL SE
Everett WA 98208
USA

DIAGNOSIS

All wear levels appear within acceptable limits for first sample. Concentration of water at a severe level. Sodium level (possible salt water residue or from operational environment) elevated. Unable to obtain accurate viscosity result at 40C due to excessive water in sample. Action: Check for source of water entry. Change oil if not already done. Resample after corrective action to further monitor.

ANALYST: Stan.Leitz

STOP
Severe

LEGEND
STOP Severe | Abnormal | Caution | Normal

DATE SAMPLED	06-Jun-22
DATE RECEIVED	10-Jun-22
DATE REPORTED	10-Jun-22

LAB NO.		40111361066
SIF NO.		700040701
TIME ON UNIT	Hrs	650
TIME ON OIL	Hrs	
OIL BRAND		Unidentified
OIL TYPE		Unidentified
OIL GRADE		Unknown
OIL ADDED	Ltrs	0.0
FILTER	Hrs	Not Applicable
OIL CHANGED		Not Changed
WO NUMBER		

Metals (ppm)	
Iron (Fe)	203
Chromium (Cr)	2
Lead (Pb)	<1
Copper (Cu)	20
Tin (Sn)	<1
Aluminium (Al)	<1
Nickel (Ni)	<1
Silver (Ag)	<1
Titanium (Ti)	<1
Vanadium (V)	<1
Contaminants (ppm)	
Silicon (Si)	2
Sodium (Na)	335
Potassium (K)	12
Additives (ppm)	
Magnesium (Mg)	75
Calcium (Ca)	1052
Barium (Ba)	<1
Phosphorus (P)	347
Zinc (Zn)	58
Molybdenum (Mo)	55
Boron (B)	9
Contaminants	
Water (%)	5.00
Physical Tests	
Viscosity (cSt 40C)	-
PQ Index	12
Solids (%)	0.1

STOP

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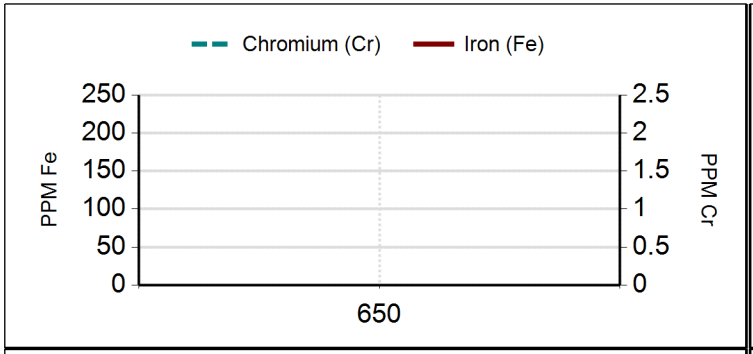
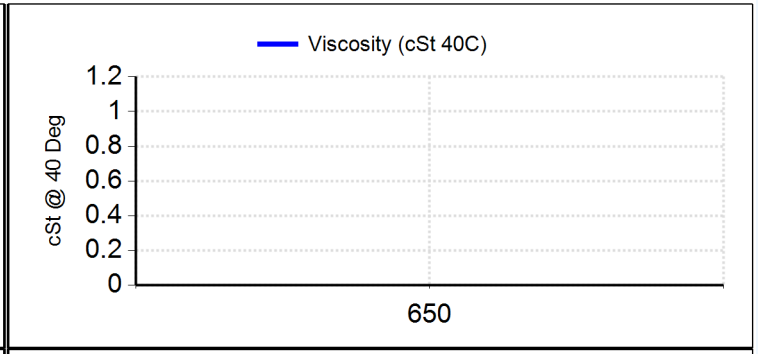
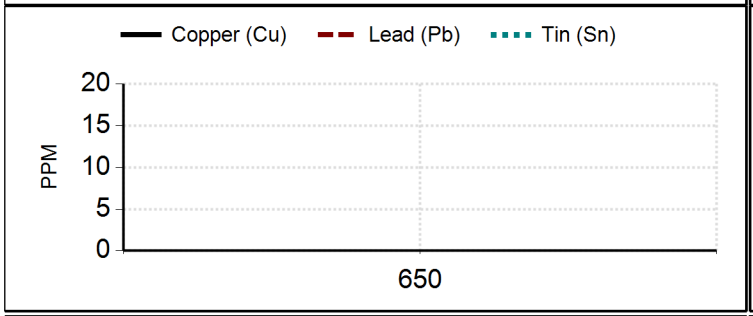
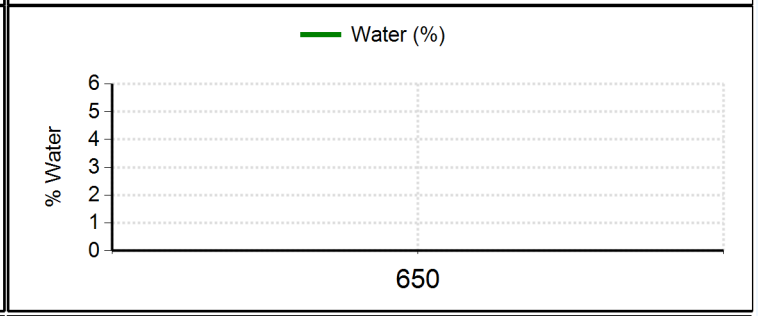
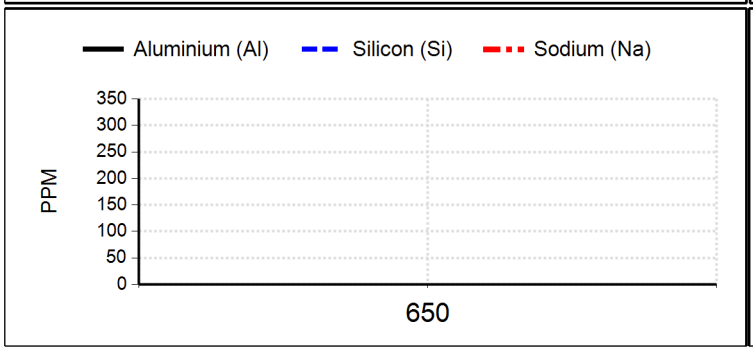
UIN 095F075











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Europe
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TEST METHODS:

Acid Number:	ASTM D974/D664 (*M)
Base Number:	ASTM D4739 (*M)
Base Number (Perchloric):	ASTM D2896 (*M)
Fuel Dilution by GC:	ASTM D7593
Fuel Dilution Visc/Setaflash	In House
Fuel Soot ATR/IR:	ASTM D7686 (*M)
Soot by FTIR:	ASTM D7844
Glycol:	In House
Metals by ICP AES:	ASTM D5185 (*M)
Ox, NOx, SOx, FTIR:	ASTM E2412/D7418/D7414 D7415
PQ Index:	ASTM D8120 (*M)
Particle Count:	ASTM D7647 (*M) / ISO 4406
Viscosity:	ASTM D445 (*M) / D7279 (*M)
Water KF:	D6304 / E203 (*M)
Water Crackle:	In House

*M - Modified Method

UIN 095F087

Gearbox

Unit No. [redacted]

Unit:
Make
Model
Serial No.

Site

Compartment:
Name Port Reduction Gear
Make ZF Hurth
Model .
Serial No. [redacted]
Capacity: 0.0 Ltrs

Customer:

CWS MARITIME SERVICES LLC
2521 117PL SE
Everett WA 98208
USA

DIAGNOSIS

Bearing/bushing/thrust washer/clutch pack/bronze gear wear indicated. Silicon level (dirt/sealant material) satisfactory. Water content acceptable. Please provide missing oil information; we need manufacturer, type, and grade to evaluate the oil data. Action: Check for any abnormal noise, vibration, or poor performance. Resample after corrective action to further monitor.

ANALYST: Stan.Leitz

Abnormal

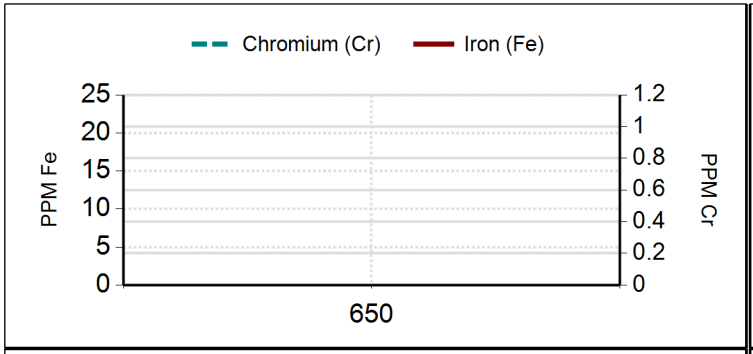
LEGEND: Severe | Abnormal | Caution | Normal

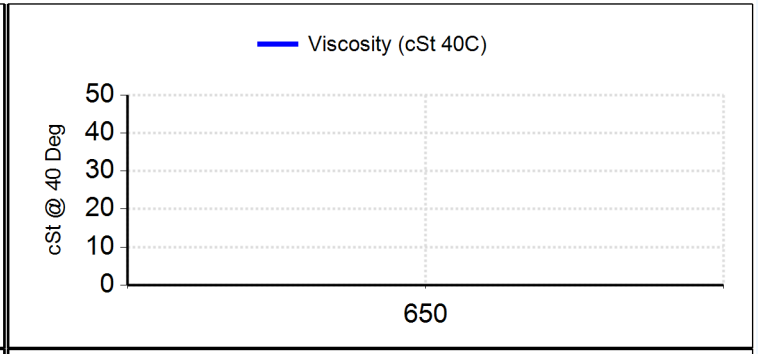
DATE SAMPLED	06-Jun-22
DATE RECEIVED	10-Jun-22
DATE REPORTED	10-Jun-22

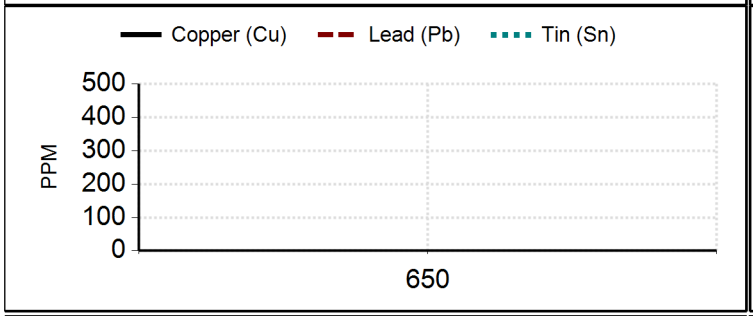
LAB NO.		40111361068
SIF NO.		700040697
TIME ON UNIT	Hrs	650
TIME ON OIL	Hrs	
OIL BRAND		Unidentified
OIL TYPE		Unidentified
OIL GRADE		Unknown
OIL ADDED	Ltrs	0.0
FILTER	Hrs	Not Applicable
OIL CHANGED		Not Changed
WO NUMBER		

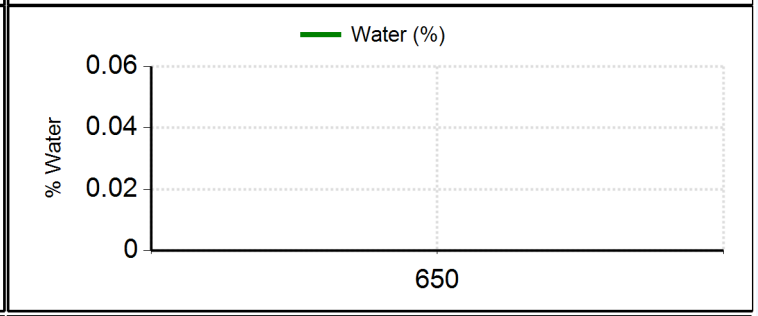
Metals (ppm)	
Iron (Fe)	24
Chromium (Cr)	<1
Lead (Pb)	3
Copper (Cu)	435
Tin (Sn)	<1
Aluminium (Al)	<1
Nickel (Ni)	<1
Silver (Ag)	<1
Titanium (Ti)	<1
Vanadium (V)	<1
Contaminants (ppm)	
Silicon (Si)	10
Sodium (Na)	6
Potassium (K)	4
Additives (ppm)	
Magnesium (Mg)	13
Calcium (Ca)	2953
Barium (Ba)	<1
Phosphorus (P)	842
Zinc (Zn)	984
Molybdenum (Mo)	63
Boron (B)	260
Contaminants	
Water (%)	<0.05
Physical Tests	
Viscosity (cSt 40C)	45.2
PQ Index	12
Solids (%)	<0.1

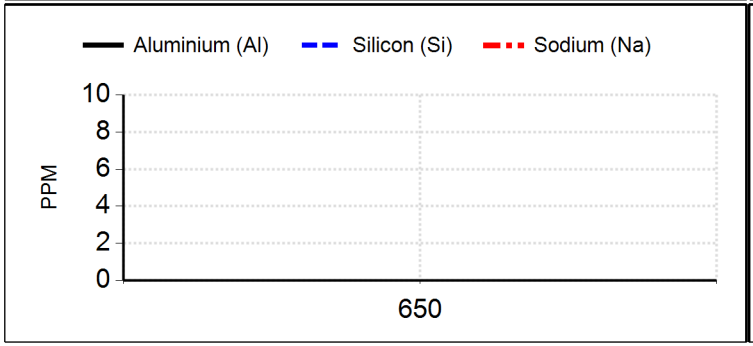
UIN 095F087











Filter Image

Filter patch test is not performed Contact laboratory for more information

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Glycol:	In House
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Ox, NOx, SOx, FTIR:	ASTM E2412/D7418/D7414 D7415
PQ Index:	ASTM D8120 (*M)
Particle Count:	ASTM D7647 (*M) / ISO 4406
Viscosity:	ASTM D445 (*M) / D7279 (*M)
Water KF:	D6304 / E203 (*M)
Water Crackle:	In House

*M - Modified Method

UIN 095F08A

Gearbox

Unit No. [redacted]

Unit:
Make
Model
Serial No.

Site

Compartment:
Name Starboard Reduction Gear
Make ZF Hurth
Model .
Serial No. [redacted]
Capacity: 0.0 Ltrs

Customer:

CWS MARITIME SERVICES LLC
2521 117PL SE
Everett WA 98208
USA

DIAGNOSIS

Bearing/bushing/thrust washer/clutch pack/bronze gear wear indicated. Silicon level (dirt/sealant material) satisfactory. Water content acceptable. Please provide missing oil information; we need manufacturer, type, and grade to evaluate the oil data. Action: Check for any abnormal noise, vibration, or poor performance. Resample after corrective action to further monitor.

ANALYST: Stan.Leitz

Abnormal

LEGEND: Severe | Abnormal | Caution | Normal

DATE SAMPLED	06-Jun-22
DATE RECEIVED	10-Jun-22
DATE REPORTED	10-Jun-22

LAB NO.		40111361069
SIF NO.		700040699
TIME ON UNIT	Hrs	649
TIME ON OIL	Hrs	
OIL BRAND		Unidentified
OIL TYPE		Unidentified
OIL GRADE		Unknown
OIL ADDED	Ltrs	0.0
FILTER	Hrs	Not Applicable
OIL CHANGED		Not Changed
WO NUMBER		

Metals (ppm)	
Iron (Fe)	21
Chromium (Cr)	<1
Lead (Pb)	2
Copper (Cu)	333
Tin (Sn)	<1
Aluminium (Al)	2
Nickel (Ni)	<1
Silver (Ag)	<1
Titanium (Ti)	<1
Vanadium (V)	<1
Contaminants (ppm)	
Silicon (Si)	42
Sodium (Na)	3
Potassium (K)	4
Additives (ppm)	
Magnesium (Mg)	12
Calcium (Ca)	3024
Barium (Ba)	<1
Phosphorus (P)	855
Zinc (Zn)	1008
Molybdenum (Mo)	64
Boron (B)	269
Contaminants	
Water (%)	<0.05
Physical Tests	
Viscosity (cSt 40C)	44.5
PQ Index	13
Solids (%)	<0.1

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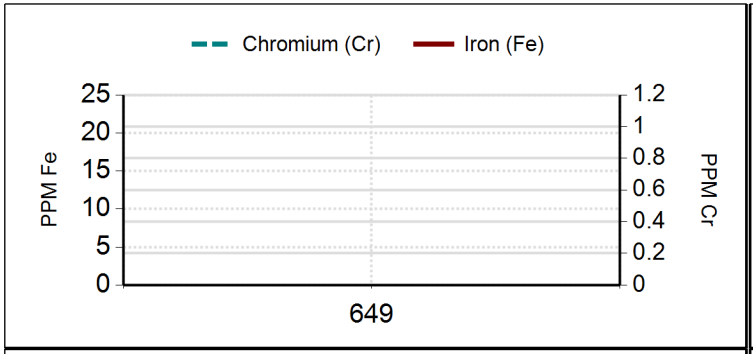
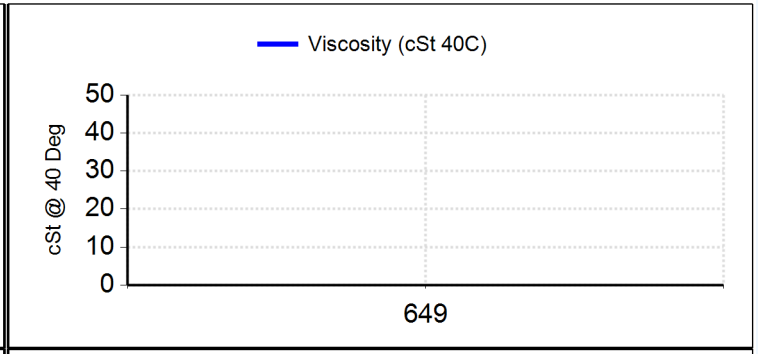
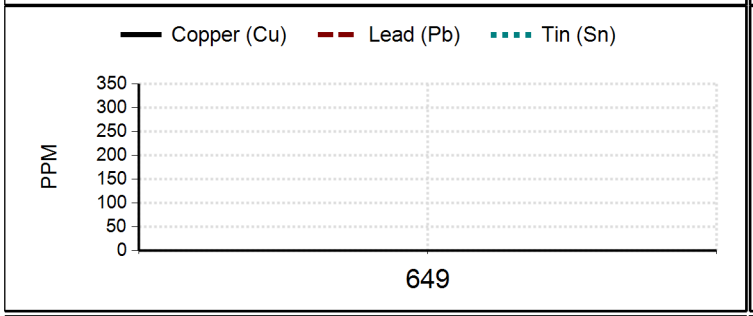
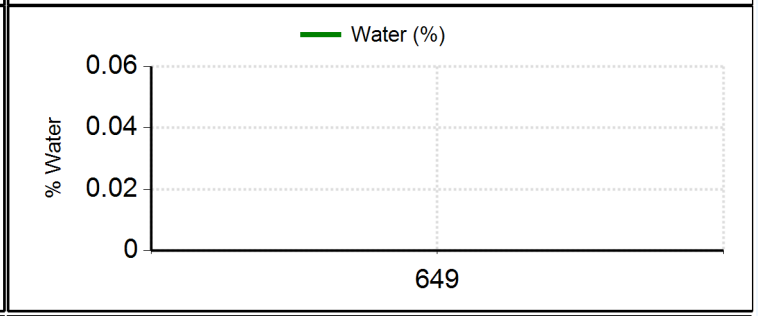
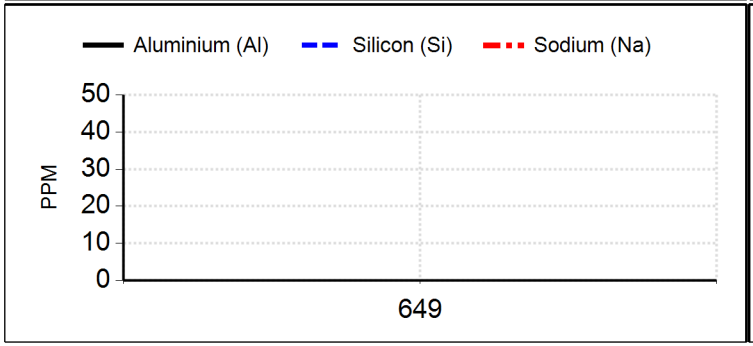
UIN 095F08A











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Portland, Oregon - 401
4943 NW Front Avenue
Portland, OR 97210
800.770.4128

Canadian Laboratories

Burlington, Ontario - 450
5036 South Service Rd.
Burlington, ON L7L5Y7
905 332 9559

Edmonton, Alberta - 402
9450 17 Ave NW
Edmonton, AB T6N 1M9
888.489.0057

Sales & Marketing

Houston, Texas
10450 Stancliff Road, Suite 210
Houston, TX 77099
877.835.8437

International Locations

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Brisbane, Perth, Sydney, Muswellbrook

South America
Santiago de Chile, Belo Horizonte, Brazil

New Zealand
Wellington

Southeast Asia
Kuala Lumpur, Singapore

Europe
Prague

TEST METHODS:

Acid Number:	ASTM D974/D664 (*M)
Base Number:	ASTM D4739 (*M)
Base Number (Perchloric):	ASTM D2896 (*M)
Fuel Dilution by GC:	ASTM D7593
Fuel Dilution Visc/Setaflash	In House
Fuel Soot ATR/IR:	ASTM D7686 (*M)
Soot by FTIR:	ASTM D7844
Glycol:	In House
Metals by ICP AES:	ASTM D5185 (*M)
Ox, NOx, SOx, FTIR:	ASTM E2412/D7418/D7414 D7415
PQ Index:	ASTM D8120 (*M)
Particle Count:	ASTM D7647 (*M) / ISO 4406
Viscosity:	ASTM D445 (*M) / D7279 (*M)
Water KF:	D6304 / E203 (*M)
Water Crackle:	In House

*M - Modified Method

UIN 095F078

Gearbox

Unit No. [redacted]

Unit:
Make
Model
Serial No.

Site

Compartment:
Name Starboard Pod
Make
Model
Serial No. [redacted]
Capacity: 0.0 Ltrs

Customer:

CWS MARITIME SERVICES LLC
2521 117PL SE
Everett WA 98208
USA

DIAGNOSIS

Bearing/gear wear indicated. Light concentration of water present. Silicon level (dirt/sealant material) satisfactory. Please provide missing oil information; we need manufacturer, type, and grade to evaluate the oil data. Action: Check for source of water entry. Advise water drain off/offline purification. Resample after corrective action to further monitor.

ANALYST: Stan.Leitz

Caution

LEGEND
Severe | Abnormal | Caution | Normal

DATE SAMPLED	06-Jun-22
DATE RECEIVED	10-Jun-22
DATE REPORTED	10-Jun-22

LAB NO.		40111361067
SIF NO.		700040703
TIME ON UNIT	Hrs	649
TIME ON OIL	Hrs	
OIL BRAND		Unidentified
OIL TYPE		Unidentified
OIL GRADE		Unknown
OIL ADDED	Ltrs	0.0
FILTER	Hrs	Not Applicable
OIL CHANGED		Not Changed
WO NUMBER		

Metals (ppm)	
Iron (Fe)	264
Chromium (Cr)	2
Lead (Pb)	<1
Copper (Cu)	25
Tin (Sn)	<1
Aluminium (Al)	<1
Nickel (Ni)	1
Silver (Ag)	<1
Titanium (Ti)	<1
Vanadium (V)	<1
Contaminants (ppm)	
Silicon (Si)	2
Sodium (Na)	32
Potassium (K)	3
Additives (ppm)	
Magnesium (Mg)	8
Calcium (Ca)	959
Barium (Ba)	<1
Phosphorus (P)	351
Zinc (Zn)	11
Molybdenum (Mo)	50
Boron (B)	<5
Contaminants	
Water (%)	0.20
Physical Tests	
Viscosity (cSt 40C)	151.4
PQ Index	17
Solids (%)	<0.1

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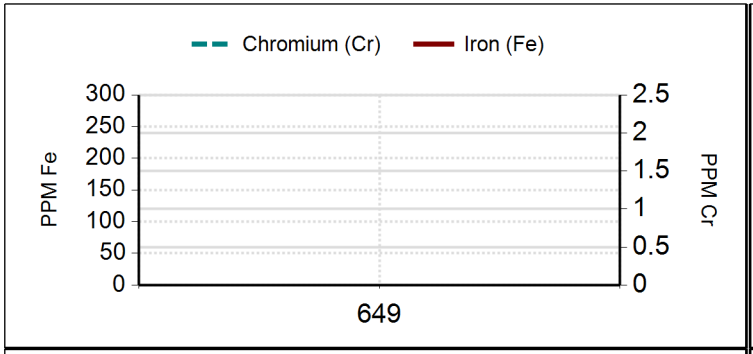
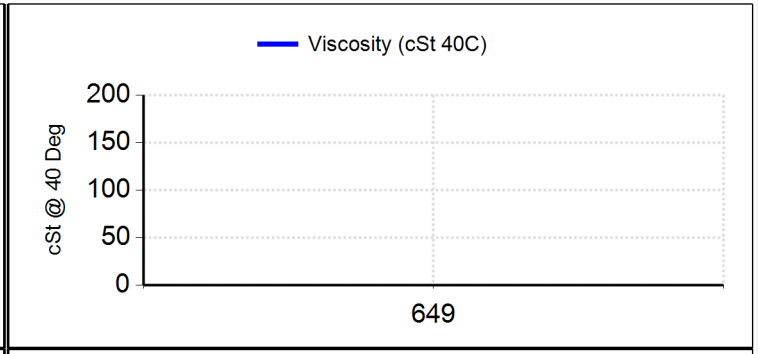
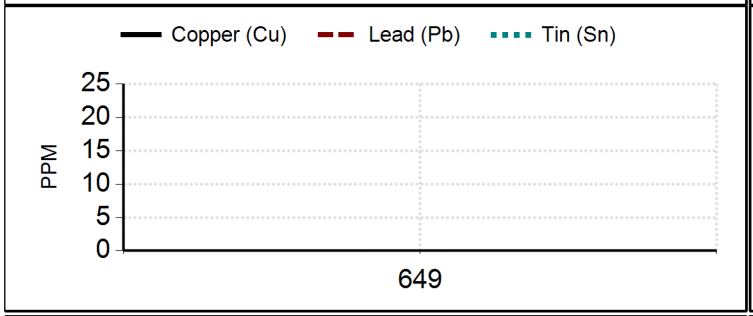
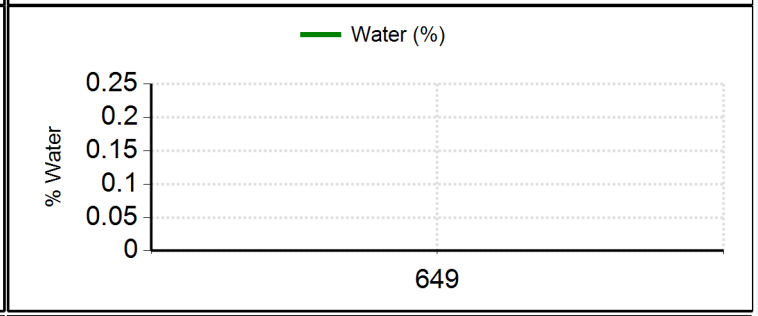
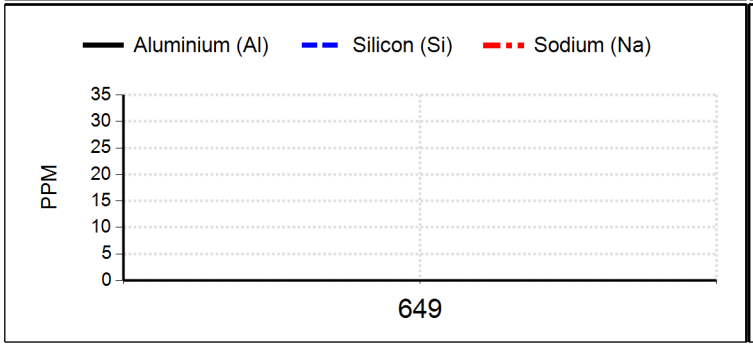
UIN 095F078











Filter Image

Filter patch test is not performed Contact laboratory for more information

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CWS Maritime Services LLC
Attn: Solarek, Charles
2521 117PL SE
Everett WA 98208
USA

0002 v1.9

U.S. Laboratories

Atlanta, Georgia - 420
5300 OakBrook Parkway
Building 200 Suite 245
Norcross, GA 30093
800.394.3669

Valley View, Ohio - 410
6180 Halle Dr. Suite D
Valley View, OH 44125
800.726.5400

Kansas City, Kansas - 430
935 Sunshine Road
Kansas City, KS 66115
800.332.8055

Phoenix, Arizona - 440
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PQ Index:	ASTM D8120 (*M)
Particle Count:	ASTM D7647 (*M) / ISO 4406
Viscosity:	ASTM D445 (*M) / D7279 (*M)
Water KF:	D6304 / E203 (*M)
Water Crackle:	In House

*M - Modified Method

UIN 095F070

Diesel Engine

Unit No. [redacted]

Unit:
Make
Model
Serial No.

Site

Compartment:
Name Starboard Diesel Engine
Make Cummins
Model QSB
Serial No. [redacted]
Capacity: 0.0 Ltrs

Customer:

CWS MARITIME SERVICES LLC
2521 117PL SE
Everett WA 98208
USA

DIAGNOSIS

All wear levels appear within acceptable limits for first sample. Silicon level (dirt/sealant material) satisfactory. Water content acceptable. Due to lack of information (oil grade) not all tests can be determined. Please provide missing oil information; we need manufacturer, type, and grade to evaluate the oil data. Action: Resample at next recommended interval to monitor and establish wear trend.

ANALYST: Stan.Leitz

Normal

LEGEND

Severe | Abnormal | Caution | Normal

DATE SAMPLED	06-Jun-22
DATE RECEIVED	10-Jun-22
DATE REPORTED	10-Jun-22

LAB NO.		40111361065
SIF NO.		700040695
TIME ON UNIT	Hrs	649
TIME ON OIL	Hrs	
OIL BRAND		Unidentified
OIL TYPE		Unidentified
OIL GRADE		Unknown
OIL ADDED	Ltrs	0.0
FILTER	Hrs	
OIL CHANGED		Not Changed
WO NUMBER		

Metals (ppm)	
Iron (Fe)	12
Chromium (Cr)	1
Lead (Pb)	<1
Copper (Cu)	10
Tin (Sn)	<1
Aluminium (Al)	4
Nickel (Ni)	<1
Silver (Ag)	<1
Titanium (Ti)	<1
Vanadium (V)	<1
Contaminants (ppm)	
Silicon (Si)	8
Sodium (Na)	5
Potassium (K)	<1
Additives (ppm)	
Magnesium (Mg)	899
Calcium (Ca)	1442
Barium (Ba)	<1
Phosphorus (P)	913
Zinc (Zn)	1105
Molybdenum (Mo)	57
Boron (B)	52
Contaminants	
Water (%)	<0.05
Coolant	No
Physical Tests	
Viscosity (cSt 100C)	14.4
Fuel (%)	--
PQ Index	<10
Soot (%) Infrared	<0.1

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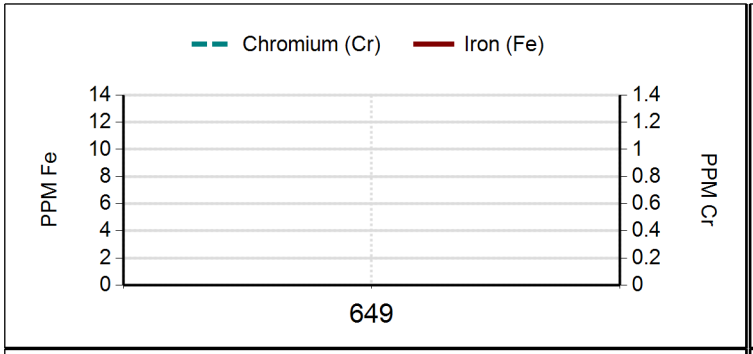
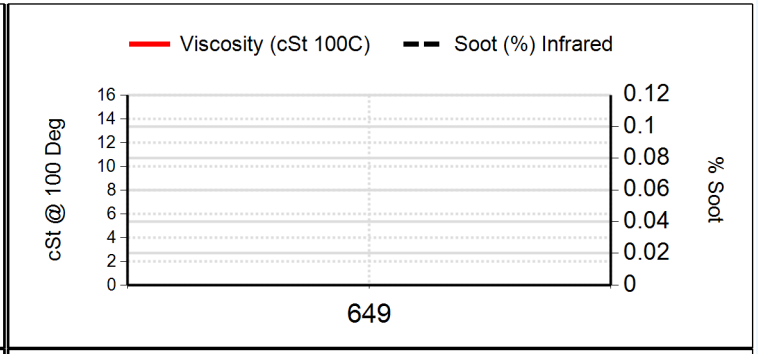
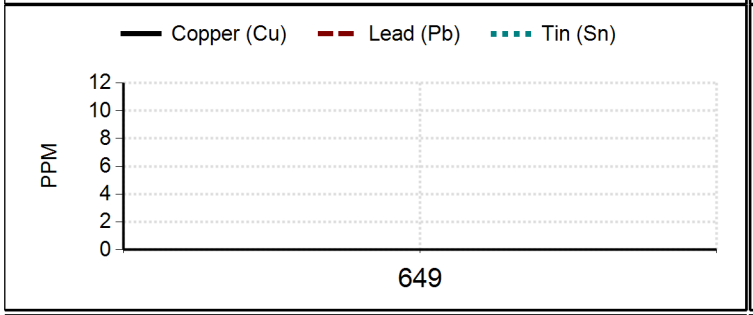
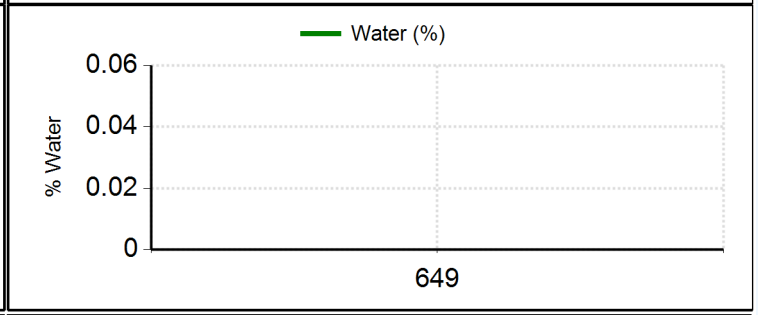
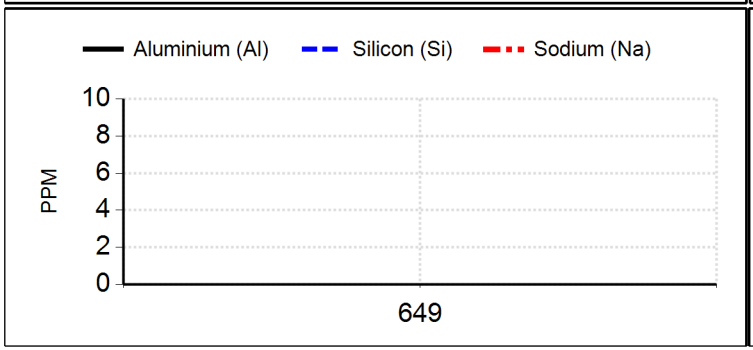
UIN 095F070











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2521 117PL SE
Everett WA 98208
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Viscosity:	ASTM D445 (*M) / D7279 (*M)
Water KF:	D6304 / E203 (*M)
Water Crackle:	In House

*M - Modified Method

Self-diagnosis data
Self diagnosis parameters detail

Workshop data

Company name	CWS Maritime Services LLC		
Address	2521 117th PL SE,	Province	
City	Everett	Postcode	98208
Telephone number		E-mail	cws@surveyorsforhire.com
Operator	Tech		

Vehicle data

License plate number		VIN	
Make	CUMMINS MARINE	Model	QSB 5.9
Engine type	359 in3 / 5.9 L	Vehicle ID*	--
Outline	Inboard engine	Period	[--/-->]
System	Diesel injection		

* identification code referred to the VIN or to the engine code

Instrumentation

SW version	TEXA IDC5 Marine 16.1.1
VCI serial number	DNHLT006638

Info ECU

ECU identification	XX - E2I
Engine manufacturing date	--
Engine serial number	0
ECU code	Z90389.06
Software Calibration Phase	
Calibration date	31/01/2007
Vehicle or equipment year	**********
Customer position	**********
Control unit serial number	38108163
Part Number	CM850
Customer name	Customer Name**
Builder	GENERIC
Vehicle model	GENERIC
Engine manufacturer	CMMNS
Customer unit number	**********
VIN	**********
Engine code	**********
ECM date/time	
ECM name	Epic Ind/Echo 2 Marine
Marketing name	QSB 4.5/5.9/6.7 - CM850
Engineering name	
Engine hours	201.7 h

General test data

Date	06-06-2022
Start time	12:09

Values detected

Measurement	U.M.	Min. value	Max. value	Value

Engine load	%	16	99	32
Accelerator pedal position	%	0	99	0
Atmospheric pressure	PSI	0.00	14.33	14.33
Intake manifold pressure	PSI	0.00	32.30	0.10
Engine oil pressure	PSI	0.00	45.83	15.11
Exhaust gas pressure	PSI	0.00	0.00	0.00
Fuel temperature sensor	°F	32.00	158.36	158.36
Engine oil temperature	°F	32.00	257.72	246.92
Engine speed	rpm	0	3374	597
Fuel rail pressure	PSI	0.00	23278.55	6091.58
Water In Fuel Detected Total Accumulated Time	(hh:mm:ss)			259:32:24
Turbocharger output air temperature	°F	32.00	32.00	--
Engine operation time	(hh:mm:ss)			201:51:04
Short term fuel consumption	gallons/hour	0.00	25.86	0.58
Requested fuel flow	gallons/hour	0.00	26.21	1.98
Intake manifold air temperature	°F	32.00	105.80	84.92
Fuel instantaneous consumption	mpg (US)	0.1	0.1	0.1
Fuel Rail Pressure Commanded	PSI	0.00	23206.03	6077.08
Turbocharger speed	rpm	0	0	--
Ambient air temperature	°F	32.00	32.00	32.00
Turbocharger compressor inlet temperature	°F	32.00	361.58	361.58
ECM key-ON time	(hh:mm:ss)			470:52:34
Fuel regulator inlet pressure	PSI	96.60	96.60	96.60
ECM operation time	(hh:mm:ss)			13398:28:15

Stamp and signature

Self-diagnosis data
Self diagnosis parameters detail

Workshop data

Company name	CWS Maritime Services LLC		
Address	2521 117th PL SE,	Province	
City	Everett	Postcode	98208
Telephone number		E-mail	cws@surveyorsforhire.com
Operator	Tech		

Vehicle data

License plate number		VIN	
Make	CUMMINS MARINE	Model	QSB 5.9
Engine type	359 in3 / 5.9 L	Vehicle ID*	--
Outline	Inboard engine	Period	[--/-->]
System	Diesel injection		

* identification code referred to the VIN or to the engine code

Instrumentation

SW version	TEXA IDC5 Marine 16.1.1
VCI serial number	DNHLT006638

Info ECU

ECU identification	XX - E2I
Engine manufacturing date	30/09/2009
Engine serial number	[redacted]
ECU code	Z90389.06
Software Calibration Phase	
Calibration date	31/01/2007
Vehicle or equipment year	**********
Customer position	**********
Control unit serial number	34158791
Part Number	CM850
Customer name	Customer Name**
Builder	GENERIC
Vehicle model	GENERIC
Engine manufacturer	CMMNS
Customer unit number	**********
VIN	**********
Engine code	**********
ECM date/time	
ECM name	Epic Ind/Echo 2 Marine
Marketing name	QSB 4.5/5.9/6.7 - CM850
Engineering name	
Engine hours	649.1 h

General test data

Date	06-06-2022
Start time	12:25

Values detected

Measurement	U.M.	Min. value	Max. value	Value

Engine load	%	12	99	30
Accelerator pedal position	%	0	99	11
Intake manifold pressure	PSI	-0.03	31.86	0.42
Engine oil pressure	PSI	15.17	49.73	21.99
Coolant temperature	°F	169.52	183.92	174.56
Intake manifold air temperature	°F	80.60	118.22	86.18
Turbocharger output air temperature	°F			--
Engine oil temperature	°F	242.24	257.18	247.64
Engine operation time	(hh:mm:ss)			649:11:41
Engine speed	rpm	0	3411	875
Water In Fuel Detected Total Accumulated Time	(hh:mm:ss)			01:48:41
ECM key-ON time	(hh:mm:ss)			1326:01:32
Fuel instantaneous consumption	mpg (US)	0.1	0.1	0.1
Fuel rail pressure	PSI	4974.79	23757.18	9833.56
Fuel Rail Pressure Commanded	PSI	5076.32	23206.03	9775.54
Fuel regulator inlet pressure	PSI	96.60	96.60	96.60
Short term fuel consumption	gallons/hour	0.55	25.97	1.27
Atmospheric pressure	PSI	14.39	14.39	14.39
Turbocharger speed	rpm			--
Requested fuel flow	gallons/hour	1.34	26.71	2.87
Ambient air temperature	°F	32.00	32.00	32.00
Turbocharger compressor inlet temperature	°F	361.58	361.58	361.58
ECM operation time	(hh:mm:ss)			13398:28:15
Exhaust gas pressure	PSI	0.00	0.00	0.00
Fuel temperature sensor	°F	158.36	158.36	158.36

Stamp and signature