

ATTACHMENT A

M/V EMERALD ISLE WORK PACKAGE SPECIFICATIONS *REISSUE*

Brand names specified are used as an example of the quality, performance, and industry standards desired of the equipment/products/and materials. Approved equals must be approved by BITA/BIBCO.

Project 1:

Shaft/Bearings/Shaft Tubes/Seals/Alignments

- Shipyard to order *one new shaft* for the port side *and bearing sets for both* the starboard and port side.
- Remove and inspect both shafts, bearings and seals. Make repairs to shaft tubes. Replace port side with new shaft. Align both sides. Old shaft will be returned with BIBCO on vessel. If new bearings/seals are not needed, they will be kept as spares. Make repairs to shaft tubes. Alignments.

Technical and Parts

Shaft

The shaft is supported without liners by two water lubricated bearings in the vessel. The shaftline arrangement is detailed on the original construction drawing H56-G01-02, revision C. See Attachment B - Shaft Documents.

The shaft shall be 6-inch diameter, alloy 17-4 PH stainless steel boat shafting, ("Aquamet 17" or equal), centerless ground, having 135 ksi ultimate tensile strength. The shaft length given by reference (2) is around 27'- 2" (326 inches). See Attachment B for exact measurements and details.

The shaft diameter, straightness and surface finish shall all be verified and documented to be within the manufacturing tolerances published by the material supplier.

At the propeller end the shaft shall be tapered, keyed and threaded in accordance with SAE standard J-755.

Keyway ends at each end of the shaft shall be "spooned" for stress relief.

Documentation reports for the shaft diameter, straightness and surface finish shall all be furnished to the BIBCO/BITA.

Bearings:

2 - cutlass bearings	861532101	Size 6" ID x 7.75" OD x 24" LG
2 - stave bearings	806720152	L-0600-0800x6 C2 16.5 secured
2 - compression head	806416131	0600-0614
16 - socket head cap screws	893161600	5/8x1-1/4 18-8 SST
16 - lock washer Hi Collar	891371601	5/8 18-8 SST

Seals:

The vessel currently has Duramax DryMax Stern Tube Seal Systems. Remove/inspect/clean/and replace parts per manufacturers recommendations. See Attachment C - DryMax Stern Tube Seal System. Replacement parts are listed on page 9 of Attachment C.

2 - Drymax Seal Assembly 84410600013 Model 600-0600 – 6” diameter

4 - seal rings

2 - air seal rings

2 - seal assembly gaskets

2 - o-rings

4 - stainless steel garter rings

Shaft Tubes

The starboard shaft tube in the void space is showing significant rust. See Attachment D - Starboard Shaft Tube Photos.

Inspect port and starboard shaft tube void areas.

Repair as necessary.

Alignments

- Alignment for both port and starboard sides.
- Leave shafts unbolted and check alignment after entering water. Troubleshoot and bolt in place.
- Alignment is to be completed according to the Caterpillar Mounting and Alignment Instructions, and the Twin Disc Alignment Guide see Attachment B.

Project 2:**Five Year Inspections**

- Prepare vessel and assist the United States Coast Guard with the five-year inspections per CFR 46.
- Make all necessary repairs and return vessel to working order.

Project 3:

Propellers/Rudders

- Remove rudders inspect and reinstall.
- Remove Khalenburg propellers/inspect/make necessary repairs/bluefit/reinstall.

Project 4:

Fuel Tank Cleaning

- Pump out remaining fuel from 9,500 gallon tank (figured per gallon after arrival).
- Pressure wash tank
- Remove sludge and growth
- Dry tank

Project 5:

Air Receiver Replacements

Two 120-gallon horizontal air receiver tanks need to be replaced. Owner will supply tanks. New tanks will be Manchester model 302480 or equivalent. A hole approximately 25" x 28" will need to be cut into car deck to remove the old tanks and install new.

- Remove and reinstall air compressor engines and motors onto new tanks and test.
- Mounting surfaces may need to be modified.
- Bevel and prep car deck plate for welding.
- Weld car deck plate back into place using ceramic backing.
- Dispose of old tanks.

See Attachment E - Air Receiver Tanks.

Project 6:

Keel Cooler Inspection/Grid Cleaning

- Drain and dispose of coolant if not able to reuse
- Remove keel coolers
- Clean and remove debris
- Inspect for cracks/bends and any other damage

- Repair damage
- Reinstall and test for leaks

There are eight keel coolers installed on the vessel:

- Two - Walter 2TT-80s on mains
- Two - Walter TT-56 on gensets
- Two - Fernstrum D072 on mains
- Two - Fernstrum D066U on aftercoolers

Project 7:

Bow Thruster Inspection/Grid Cleaning

- Remove and clean grid
- Inspect tunnel for cavitation/blade for any damage

Project 8:

Ramp Repair Evaluation

The long pin that attaches the ramp to the stern needs to be replaced. The shipyard is to assess if the wear is on the pin or the ramp sections and evaluate if a larger diameter rod could be used and reduce the play at the attachment points. See Attachment F - As Built Ramp Drawing and Photos.

Ramp connecting keys and pins. It is thought the section in that drawing c-c needs to be made larger where the links attach.

This system has been problematic and would like the shipyard to determine if a new link retaining system should be designed or if the access holes can be made larger to more easily service the links.

Quote price only for evaluation. Actual work will be quoted after assessment at the shipyard.

Project 9:

Void Painting

Any areas needing attention discovered during inspections (priced per sq ft):

Preparation:

- Clean and degrease if needed.

- Power tool clean any bare steel. Remove loose coating to bare steel, being tight on edges.
- Remove dust particles by washing or air blow down procedure.

Coating:

- Spot prime any bare steel with marine grade primer.
- Apply 2 full coats of marine grade paint.