





## S.S. Twin Sov. "HABANA"

(2)

by striking the ground with the starboard Propeller, whilst vessel maneuvering with the main engines.

The 2 screw shafts (CL) drawn in examined and found both with the liners loose in a considerable area at the centre and at the propeller end, The Port side one, more than the starboard side one. The spare Screw shaft with the following marks stamped on the flange LLOYD'S  
No 949  
25-3-36 has been fitted at Port side as a working shaft and the Port side loose liner shaft, taken ashore for renewing the liner.

The starboard Screw shaft which also has a loose liner, has been fitted back in its place, but has been Recommended to examine the shaft again and to fit in its place a shaft with a tight liner next dry-docking (April 1944) when also a new bronze Propeller ordered to Mueen Sociedad Española de Construcción Naval of this port, will be fitted to the screw-shaft at that time.

The Port side Screw-shaft which was taken ashore with a loose liner in order to renew the liner, will be fitted as a working screw-shaft at starboard side next dry-docking.

Sea cocks + valves opened out ground in examined and found the Port side ballast pump sea injection valve seat loose, same have been renewed, and 5 ship side cocks with the arrangement for withdrawing the Key when the cock is shut, found broken and out of order, same have been renewed and place in a good working order.

Main Engines

Open out the Port + starboard, side HP + LP going ahead and astern turbines and examined the blading rotor shafts, the reduction gear shafts, shaft bearings, thrust and intermediate shafts, fixed and moving blades, dummy and oil baffles, casing, valves, and teeth main condensers found all satisfactory after recommended repairs &/or renewals done as under.

Auxiliary machinery

All opened out, The 3 steam (70 KW) dynamo engines, bilge + service pumps, 2 centrifugal circulating pumps, 2 evaporators + one evaporator feed pump, 2 Weir's duplex automatic main feed pumps, 2 Weir's dual wet + dry air pumps, 2 fresh water pumps, 2 lubricating oil pumps with filters and oil coolers, one oil cooler water circulating pump. 2 fan engines and one pump which was used before as an ash ejector at the storehouse, now have been arranged as an auxiliary feed pump, and the ash ejector arrangement removed, Port condenser, feed heater, steering engine + windlass, all examined and condensers, oil cooler and feed heater, hydraulically tested, found all satisfactory after recommended repairs done as under.

Pumping arrangement

with all alterations carried out now for carrying oil fuel at the vertical and settling tanks found in a good working condition.

New fuel oil vertical and settling tanks, fitted with steam heating coils, all steam pipes + valves have been tested with 360 lbs/sq" hydraulic pressure found all tight and sound. The drains of these pipes go to the observation tank at the storehouse.

The oil fuel leaving the bottom part of the fuel oil vertical + settling tanks are



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fitted with Turnbull's Patent Quick closing sluice valves, arranged to close from deck position by pulling a wire rope.

These tanks are fitted with the necessary filling, air and sounding pipes and all other fittings as required by our Rules.

All fuel oil & settling tanks have been tested with water found them tight.

Spare gear of main and auxiliary machinery found complete and in good order.

All main steam and auxiliary steam pipes over 3" bore essential at sea have been tested with hydraulic pressure of 360 lbs/sq" found all tight & sound, as well as the new steam & feed pipes fitted and as found necessary.

The 7 main boilers examined throughout and new safety valves of the COCKBURN HIGH LIFT type of  $\frac{3}{4}$ " <sup>See wire from Rbo.</sup> dia. have been fitted to each boiler, the valve chests have been hydraulically tested to 360 lbs/sq" found them tight & sound, all mountings opened out ground in examined and found in good order after recommended repairs & / or renewals done as under.

Oil Burning apparatus

Oil burning apparatus, have been installed on this vessel now, arranged for burning heavy oil of flash point not lower than 65.5 °C on the 7 boilers.

The above apparatus have been obtained from U. S. A. manufactured by Messrs TODD oil burning system 601 West 26 St. New York, Patent 1,203,292 Oct. 31, 1916, composed as follows: -

2 duplex horizontal pressure pumps made by Messrs DEAN BROS. DURABLE INDIANAPOLIS. Nos 6029 + 60291 of 7" x 4 1/2" x 10" fitted the suction with the necessary cold filters and with automatic spring loaded release valves.

3 fuel oil heaters elements made by Messrs TODD U. S. A. coils test pressure 600 lbs/sq" Body 500 lbs/sq" with the necessary hot filters, manometers, valves, etc.

2 Weir's Transfere pumps of 8" x 9" x 18" made by the Sociedad Española de Construcción Naval of Bilbao.

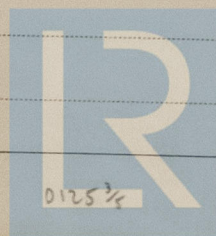
All the fuel oil pipes leading from the fuel oil pressure pumps to the burners at the main boilers and back to the pressure pumps suction, with the necessary thermometers and pressure gauges etc. have been hydraulically tested to 500 lbs/sq" found all tight and sound. Also the steam heating pipes inside the settling tanks.

The seven boilers furnace mounts have been converted from coal to oil fuel burning by fitting new furnace fronts made by Messrs TODD of U. S. A. with oil burners, forced air regulation valves and ducts, and starting up hand pressure apparatus has been supply. Spare gear for oil burning found complete and good.

After the oil burning installation completed, the oil burning apparatus have been tested to full power found them to work satisfactory. Boilers examined under steam and all safety valves adjusted as above, also accumulation test carried out and found satisfactory.

Electrical equipment

a. separate report on form (Rpt 13) has been made, attached to this one, as most of the cables & fittings from the main switchboard to all different parts of the vessel have been renewed and modified.



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Repairs now done

Main engines: - Both port. + starbd. ahead + astern, fixed + moving turbine blades + casing, cleaned, dressed up and several blades faired in place as found necessary. HP + LP Reduction gear pinion bearings white metal renewed and all turbine + gear bearings adjusted, and all valves + fittings overhauled. Port side main reduction gear wheel shaft, after end bottom half bearing, broken white metal renewed. Expansion distance piece made of copper from the starboard turbine to the main condenser renewed. To the 2 main condensers all tubes removed and both condensers and tubes cleaned, 2645 tubes and all ferrules renewed and afterwards both condensers tested with water.

Auxiliary engines repairs

Centrifugal circulating pumps: - crank shafts of the 2 engines skimmed up + all bearings adjusted, piston rings + valves renewed + bronze impeller shafts renewed.

3 Dynamo engines: - all crank shafts skimmed up and bearings renewed as found necessary and adjusted, all piston rings renewed and all engines adjusted.

2 Turbine Weir's oil pumps: - both pumps overhauled and shuttle steam valves renewed.

Turbine oil cooler: - cleaned + 7 tubes renewed + water tested.

Turbine oil cooler water circulating pump: - all steam piston rings renewed, - 2 piston rods renewed, steam cylinders rebored + pistons renewed, all valves overhauled.

Evaporator pumps: - both steam cylinders + water buckets rebored, and all pistons + rings renewed, the whole pumps overhauled and valves adjusted.

2 fresh water pumps: - all piston rods, valve spindles + piston rings renewed + the 2 pumps overhauled.

Bilge + service pump at fore end of engine room: - water end cast iron chest found broken renewed, steam cylinders rebored, piston rings renewed + the whole pump overhauled + cast iron chest water tested.

General service pump at fore end of engine room: - steam cylinders rebored + piston rings renewed, the whole pump overhauled.

Ballast pump Port side of engine room: - steam cylinders rebored, piston rings + rods renewed + the whole pump overhauled.

2 Bilge pumps at starbd. side: steam cylinders rebored + piston rings renewed, water end piston rings renewed, slide valves renewed + pumps overhauled.

2 Weir's main feed pumps: - all steam cylinders rebored, starboard pump water bucket rebored + Port pump chest renewed + hydraulically tested to 360 lbs/sq. inch, steam + water end rings renewed, all steam shuttle valves renewed and both pumps overhauled.

2 Weir's dry + wet air pumps: - all steam cylinders + air buckets rebored and both steam and air bucket pistons + rings renewed and all pumps overhauled.

Ash ejector pump now converted into a feed pump at the after end of Boiler room: - all steam cylinders + water buckets rebored + pistons + rings renewed. Pump overhauled and supply and fit in place the necessary tubes and valves, to carry out its work, afterwards pump tested + found to work satisfactory.

2 Evaporators: - cleaned + all valves overhauled.

2 Fan steam engines: - steam cylinders rebored + pistons + rings renewed and both engines overhauled, fans part renewed.



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Feed heater one tube renewed + 5 expanded, afterwards hydraulically tested to 600 lbs/0" found same tight

Pumping arrangement good number of pipes renewed as found necessary and both bilge + tank valves overhauled.

Main Boilers

All safety valves renewed and all mountings removed from the 7 boilers taken to the shops + repaired +/or renewed as found necessary, all feed pipes removed taken to the shops and hydraulically tested to 500 lbs/0" found them tight + sound.

The following plain + stay tubes have been renewed to the main boilers

	FORWARD END	BOILER	PORT FURNACE		CENTRE FURNACE		STARBOARD FURNACE	
			Plain tubes	Stay Tubes	Plain tubes	Stay Tubes	Plain tubes	Stay Tubes
PORT SIDE	N°1	N°1	25		12	2	5	
	storehouse	N°2	7	3	18		31	
	N°2	N°3	7		5		10	
	N°3	N°4	4		28	4	4	2
	N°4	N°5	20		18		30	
	N°5	N°6	12	3	35		14	
	N°6	N°7	8		61		21	1

after the above work done the 7 boilers have been hydraulically tested to 180 lbs/0" found them tight + sound

Lagging removed from the 7 boilers and shell cleaned and afterwards covered with new insul. lag material + galvanized sheets secured with galvanized iron straps + tightening screws.

Funnel renewed, + boiler uptake part renewed + smoke box doors overhauled + made tight. dampers + other means of obstruction the draught in the uptake removed.

Trial Trip

after the above repairs carried out several mooring trials and an official sea Trial Trip was run at full power over the measured course in ballast condition found the main and auxiliary machinery and Boilers with the new oil burning to work satisfactorily.

Fire Extinguishing apparatus.

at the boiler room fire extinguishing apparatus have been fitted as specified on approved plan dated 22<sup>nd</sup> May 1942

Ades