

INTRODUCTION

Engines need regular interval overhaul. All units of main engine and auxiliary engines needed to be overhauled while the vessel in Tuzla/Anchorage Area, Tuzla/Gemsan Dry Dock & Tuzla/Türkter Shipyard. Regarding to schedule, the added value of Teknomarin's expert diesel repair capabilities were put to the test.

This report including engines below;

**SULZER**

SULZER RND 90 MAIN ENGINE OVERHAUL

**HITACHI**

HITACHI B&W 6323HH NO:1/2/3 AUX. ENGINE OVERHAUL

**YANMAR**

YANMAR T260L-ST NO:4 AUX. ENGINE OVERHAUL

**MAN
B&W**

MAN B&W 6L23/30 NO:5 AUX. ENGINE OVERHAUL

And all engine room aux. machineries jobs to be done.



TEKNOMARIN
MARINE TECHNICAL INC.

SHIP REPAIR CONVERTING DRY DOCKING HYDRAULIC
PNEUMATIC MECHANIC ELECTRIC SPARE PART (NEW & USED)



PROCESS

Engine Room had some additional works to be done. Alternator rewinding, turbochargers overhauls, governors overhauls, daeration tank fabricating, cooling sea water pump, fuel oil burning pump, hydrophore pump and some other kinds of pumps overhauls, exhaust isolation jobs, inspection & recondition jobs and many others things to be done means that there is an *“engine room complete overhaul”* we can call it. This report includes all jobs to be done in M/V Almawashi.

For Main Engine | SULZER RND 90

All connections of cylinder heads dismantled. All cylinder heads dismantled & inspected on stu. One of the cylinder heads transferred to the workshop cause of its condition. Reconditioned and transferred to the vessel thus mounted & assembled. Governor dismantled & transferred to the workshop. Inspected & maintained in later transferred to the vessel and mounted. Turbochargers dismantled & transferred to the workshop. Overhauled & transferred to the vessel and mounted on stu. Air Cooler dismantled & transferred to the workshop. After the cleaning and overhaul transferred to the vessel & mounted on stu. All piston bolts dismantled. All pistons disassembled. All con.rod bearings and main bearings has opened & inspected. Some of big end bearing spotted as damaged toughly. Damaged big end bearings dismantled & transferred to the workshop. After recondition its transferred to the vessel and mounted immediately. Also security lock for big end bearing studs manufactured and supplied to the vessel. Main Engine Aux. Blower dismantled & transferred to the workshop later by overhauled and transferred to vessel & mounted on stu. All main engine exhaust expansions inspected. Two of them spotted as damaged toughly from welding lines. These expansions dismantled & transferred to the workshop. Meanwhile spare expansions mounted on stu. Later by reconditioned expansions transferred to the vessel and kept as spare. M/E exhaust manifold isolation completely renewed. Fresh Water Daeration Tank of M/E dismantled & fabricated as sample. Transferred to the vessel and mounted on stu. All gaskets & bolts with nuts renewed. Tierod Jacks transferred to the workshop, reconditioned and transferred to the vessel once again. With 600 kg/m3 these jacks tested on M/E itself.

Main Engine is ready for the test | runned | **operative.**



For Generator Engine No:1 | HITACHI B&W 6323HH

All connections of cylinder heads dismantled. All cylinder heads dismantled & transferred to the workshop. Governor dismantled & transferred to the workshop. Turbocharger dismantled & transferred to the workshop. Lub. Oil Cooler dismantled & transferred to the workshop. All piston bolts dismantled. All pistons disassembled & transferred to the workshop. All liners disassembled & transferred to the workshop. Block completely lifted & shifted in engine room. Alternator also slightly shifted in engine room by vessel crew. Crankshaft has dismantled & transferred to the workshop & inspected. Also measured. After inspection and measurements, cracks and under/oversized bearings noticed & marked. Bedplate boring & main bearing fabricating immediately started and finished. Grinding, boring, welding and fabricating jobs has done and all measurements taken once again and engine started to assembly. After the flywheel studs fabrication, crankshaft mounted and assembled with flywheel. Alternator slightly shifted once again to be connected with crankshaft. In the meantime, deflection of crankshaft has been taken and lined with alternator's rotor. Engine block & jackets inspected for cracks. Found none. Thus engine block immediately mounted & lined with the bedplate. Meanwhile liners were already honned and delivered to the vessel and shifted to engine room. Honned liners mounted on block with new o-rings & gaskets that exist supplied from ship store by vessel crew. Missing o-rings & gaskets fabricated by TEKNOMARIN technicians as samples. All connectin rod bearings fabricated according to last measures taken by TEKNOMARIN technicians. Meanwhile connectin rod boring also finished & also rods delivered to the vessel, following all connectin rods with piston crowns mounted on stu. All cylinder heads valves, guides inspected & reconditioned. Also hydrostatic pressure test made to all cylinder heads including spares. According to the firing order as maker reference, fitted & valve adjustment finished after rocker arms mounting. Air cooler & oil cooler dismantled & transferred to the workshop for cleaning, some of the special studs of coolers fabricated cause of their condition was bad. After the cleaning and check, coolers mounted on stu. After the maintenanced governor, transferred to the vessel & mounted on stu. Turbocharger overhauled, bearing sets, seal sets, oil gasket sets, baffle plate set already changed, turbocharger blasted. According to this maintenance turbocharger transferred to the vessel & mounted on stu.

*Generator Engine No:1 is ready for the test | runned | **operative.***



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PNEUMATIC MECHANIC ELECTRIC SPARE PART (NEW & USED)



For Generator Engine No:2 | HITACHI B&W 6323HH

All connections of cylinder heads dismantled. All cylinder heads dismantled & transferred to the workshop. Governor dismantled & transferred to the workshop. Turbocharger dismantled & transferred to the workshop. Lub. Oil Cooler dismantled & transferred to the workshop. All piston bolts dismantled. All pistons disassembled & transferred to the workshop. All liners disassembled & transferred to the workshop. Block completely lifted & shifted in engine room. Alternator also slightly shifted in engine room by vessel crew. Crankshaft has dismantled & transferred to the workshop & inspected. Also measured. After inspection and measurements, cracks and under/oversized bearings noticed & marked. Bedplate boring & main bearing fabricating immediately started and finished. Grinding, boring, welding and fabricating jobs has done and all measurements taken once again and engine started to assembly. After the flywheel studs fabrication, crankshaft mounted and assembled with flywheel. Alternator slightly shifted once again to be connected with crankshaft. In the meantime, deflection of crankshaft has been taken and lined with alternator's rotor. Engine block & jackets inspected for cracks. Found none. Thus engine block immediately mounted & lined with the bedplate. Meanwhile liners were already honned and delivered to the vessel and shifted to engine room. Honned liners mounted on block with new o-rings & gaskets that exists in vessel supplied from ship store by vessel crew. Missing o-rings & gaskets fabricated by TEKNOMARIN technicians as samples. All connectin rod bearings fabricated according to last measures taken by TEKNOMARIN technicians. Meanwhile connectin rod boring also finished & also rods delivered to the vessel, following all connectin rods with piston crowns mounted on stu. All cylinder heads valves, guides inspected & reconditioned. Also hydrostatic pressure test made to all cylinder heads including spares. According to the firing order as maker reference, fitted & valve adjustment finished after rocker arms mounting. Air cooler & oil cooler dismantled & transferred to the workshop for cleaning, some of the special studs of coolers fabricated cause of their condition was bad. After the cleaning and check, coolers mounted on stu. After the maintenanced governor, transferred to the vessel & mounted on stu. Turbocharger overhauled, bearing sets, seal sets, oil gasket sets, baffle plate set already changed, turbocharger blasted. According to this maintenance turbocharger transferred to the vessel & mounted on stu.

*Generator Engine No:2 is ready for the test | runned | **operative**.*



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SHIP REPAIR CONVERTING DRY DOCKING HYDRAULIC
PNEUMATIC MECHANIC ELECTRIC SPARE PART (NEW & USED)



For Generator Engine No:3 | HITACHI B&W 6323HH

All connections of cylinder heads dismantled. All cylinder heads dismantled & transferred to the workshop. Governor dismantled & transferred to the workshop. All pistons disassembled & transferred to the workshop. All liners disassembled & transferred to the workshop. Block completely lifted & shifted in engine room. Alternator also slightly shifted in engine room by vessel crew. Crankshaft has dismantled & transferred to the workshop & inspected. Also measured. After inspection and measurements, cracks and under/oversized bearings noticed & marked. Also one of the main bearing housing upper cap noticed that its broken. Later by measures taken by TEKNOMARIN technicians and rewelded & repaired according to maker's reference. Bedplate boring & main bearing fabricating immediately started and finished. Grinding, boring, welding and fabricating jobs has done and all measurements taken once again and engine started to assembly. After the flywheel studs fabrication, crankshaft mounted and assembled with flywheel. Alternator slightly shifted once again to be connected with crankshaft. In the meantime, deflection of crankshaft has been taken and lined with alternator's rotor. Engine block & jackets inspected for cracks. Found none. Thus engine block immediately mounted & lined with the bedplate. Meanwhile liners were already honned and delivered to the vessel and shifted to engine room. Honned liners mounted on block with new o-rings & gaskets that exists in vessel supplied from ship store by vessel crew. Missing o-rings & gaskets fabricated by TEKNOMARIN technicians as samples. All connectin rod bearings fabricated according to last measures taken by TEKNOMARIN technicians. Meanwhile connectin rod boring also finished & also rods delivered to the vessel, following all connectin rods with piston crowns mounted on stu. Meanwhile camshaft inspected and noticed that have to change by new one. After dismantling camshaft, new camshaft mounted and adjusted by gears. All cylinder heads valves, guides inspected & reconditioned. Also hydrostatic pressure test made to all cylinder heads including spares. According to the firing order as maker reference, fitted & valve adjustment finished after rocker arms mounting. Air cooler & oil cooler dismantled & transferred to the workshop for cleaning, some of the special studs of coolers fabricated cause of their condition was bad. After the cleaning and check, coolers mounted on stu. After the maintenanced governor, transferred to the vessel & mounted on stu. Turbocharger overhauled, bearing sets, seal sets, oil gasket sets, baffle plate set already changed, turbocharger blasted. According to this maintenance turbocharger transferred to the vessel & mounted on stu.

*Generator Engine No:3 is ready for the test | runned | **operative.***



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PNEUMATIC MECHANIC ELECTRIC SPARE PART (NEW & USED)



For Generator Engine No:4 | YANMAR T260L-ST

All connections of cylinder heads dismantled. All cylinder heads dismantled & transferred to the workshop. Governor dismantled & transferred to the workshop. All pistons disassembled & transferred to the workshop. All liners disassembled & transferred to the workshop. Alternator also slightly shifted in engine room by vessel crew. Alternator immediately disassembled & rewound and mounted once again. Crankshaft deflection has taken before & after mounting of rods. All measurements taken once again and engine started to assembly. In the meantime, deflection of crankshaft has been taken and lined with alternator's rotor. Engine block & jackets inspected for cracks. Found none. Meanwhile liners were already honed and delivered to the vessel and shifted to engine room. Honed liners mounted on block with new o-rings & gaskets that exists in vessel supplied from ship store by vessel crew. Missing o-rings & gaskets fabricated by TEKNOMARIN technicians as samples. All cylinder heads valves, guides inspected & reconditioned. Also hydrostatic pressure test made to all cylinder heads including spares. According to the firing order as maker reference, fitted & valve adjustment finished after rocker arms mounting. Oil cooler dismantled & transferred to the workshop for cleaning, some of the special studs of coolers fabricated cause of their condition was bad. After the cleaning and check, cooler mounted on stu. After the maintained governor, transferred to the vessel & mounted on stu. Turbocharger overhauled, bearing sets, seal sets, oil gasket sets, baffle plate set already changed, turbocharger blasted. According to this maintenance turbocharger transferred to the vessel & mounted on stu.

*Generator Engine No:4 is ready for the test | runned | **operative.***

For Generator Engine No:5 | MAN B&W 6L23/30

Governor dismantled & transferred to the workshop. After overhauling governor, transferred to the vessel & mounted on stu. Turbocharger overhauled, bearing sets, seal sets, oil gasket sets, baffle plate set already changed, turbocharger blasted. According to this maintenance turbocharger transferred to the vessel & mounted on stu. Sea water pumps & etc. motors of No:5 renewed & also pipes has modified according to new pump & etc. motor.

*Generator Engine No:5 is ready for the test | runned | **operative.***



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PNEUMATIC MECHANIC ELECTRIC SPARE PART (NEW & USED)

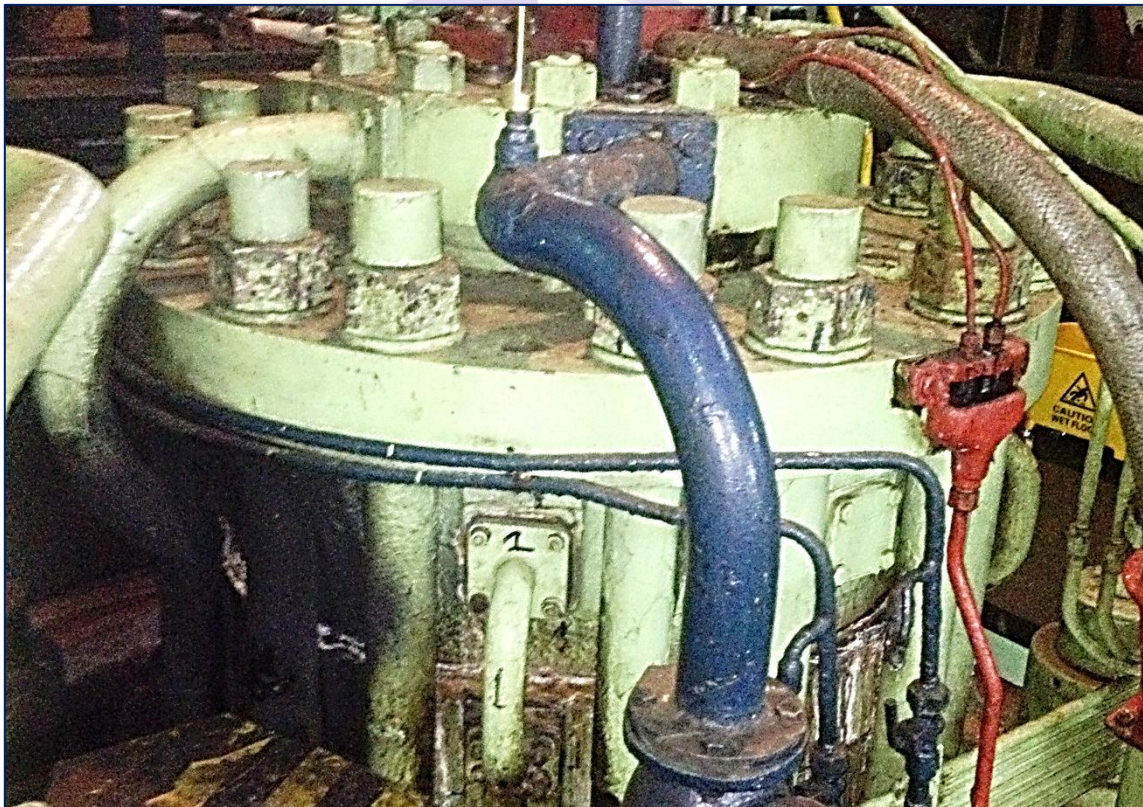


MAIN ENGINE

MAIN ENGINE CYLINDER HEAD OVERHAUL;

All cylinder heads dismantled and inspected on stu. Two of them transferred to the TEKNOMARIN's workshop cause of the condition themselves. All safety valves, starting valves and Indicator valves overhauled and tested. Indicator cocks overhauled and tested. Cylinder covers water side cleaned by chemically and hydrostatic pressure tested. Cylinder heads mounted on stu.





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PNEUMATIC MECHANIC ELECTRIC SPARE PART (NEW & USED)



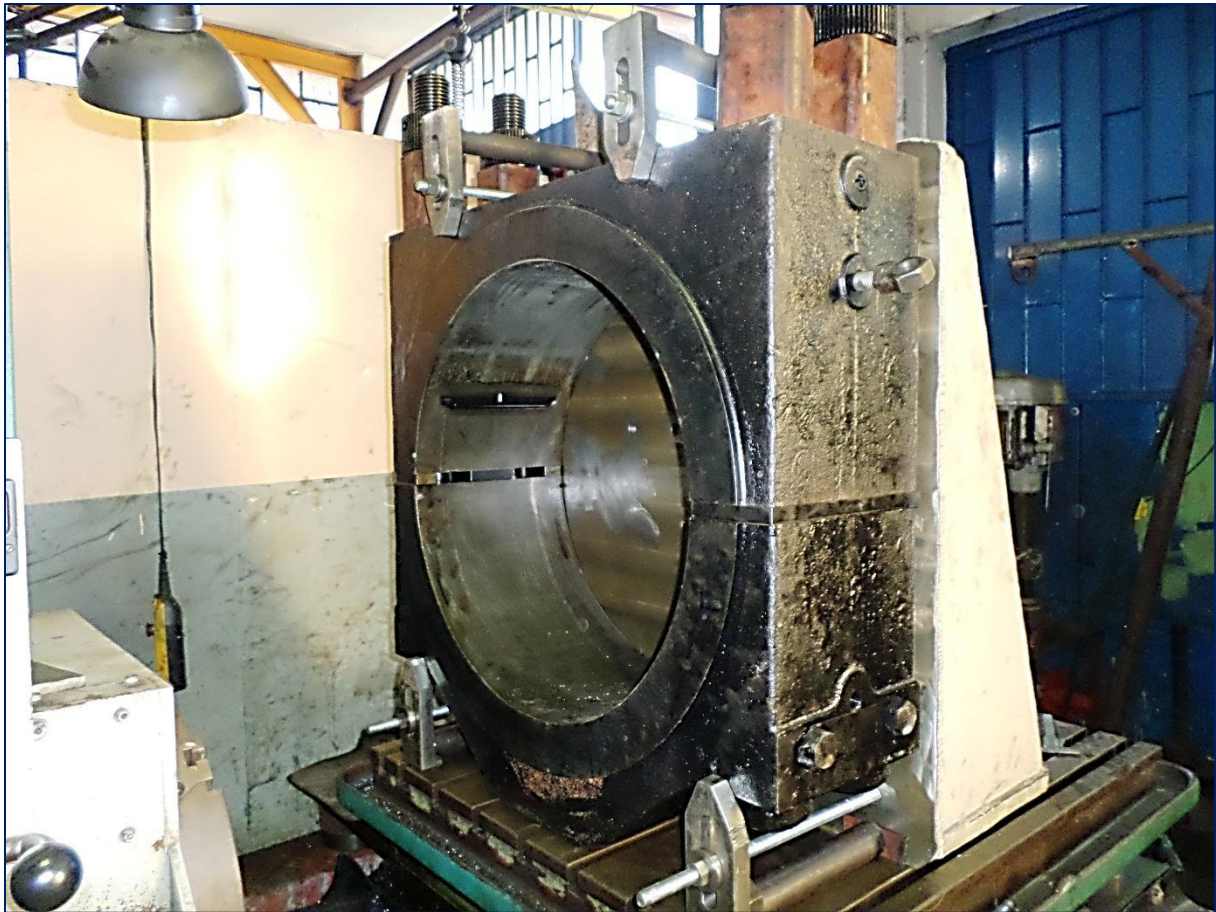
MAIN ENGINE PISTONS OVERHAUL & BEARINGS INSPECTION;

All piston bolts dismounted. All pistons disassembled. All con.rod bearings and main bearings has opened & inspected. Some of big end bearing spotted as damaged toughly. Damaged big end bearings dismounted & transferred to the workshop. Bearing cap housing ovality controlled. Piston ring groove clearence controlled. Connectin Rods bush bearings controlled. After recondition its transferred to the vessel and mounted immediately. Meanwhile security lock for big end bearing studs manufactured and supplied to the vessel. Mounted on stu.









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MAIN ENGINE GOVERNOR OVERHAUL;

Governor has dismounted from the M/E and transferred to the workshop. Later by governor has disassembled and checked as inspection. All clutch, lever & bracket system inspected & tested. Shaft & sleeve assemblies checked. Also governor block, bushings & springs inspected & assembled once again. Transferred to the vessel & mounted on stu.



MAIN ENGINE TIMING ADJUSTMENT;



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FUEL PUMP TIMING MEASUREMENT REPORT (mm)

(FUEL PUMP TIMING ÖLÇÜ RAPORU)

Vessel Name (Gemi Adı): ALMAWASHI	Engine Type & Serial (Makine Modeli & Seri No): SULZER 6RND90
Date (Tarih): 21/02/2014	
Load Indicator Position (Rak Kolu Pozisyonu): 8	Plunger Diameter (Plunger Çapı): 58mm
Firing Order (Ateşleme Sırası): 1-6-2-4-3-5	

MEASUREMENT POSITION		CYLINDER NO							
		1	2	3	4	5	6		
Suction Valve Closes at Plunger Stroke (mm) (Suction Valf Kapanma Plunger Strogu / S1)	Before Adjustment (Ayar Öncesi)	-	-	-	-	-	-		
	After Adjustment (Ayar Sonrası)	7,51	7,51	7,51	7,51	7,51	7,51		
Suction Valve Closes Before TDC (degree) (Suction Valf Kapanma Derecesi / D1)	Found (Bulunan Değer)	9,1	9,0	9,3	9,3	8,9	9,8		
	Original (Orijinal Değer)	9,5	9,5	9,6	9,6	9,2	10,3		
Spill Valve Opens at Plunger Stroke (mm) (Spill Valf Açılma Strogu / S2)	Before Adjustment (Ayar Öncesi)	-	-	-	-	-	-		
	After Adjustment (Ayar Sonrası)	36,14	36,14	36,14	36,14	36,14	36,14		
Spill Valve Opens After TDC (degree) (Spill Valf Açılma Derecesi / D2)	Found (Bulunan Değer)	14,2	14,3	13,9	14,2	14,6	13,6		
	Original (Orijinal Değer)	13,7	13,8	13,7	13,7	14,2	13,0		
Effective Stroke (mm) (Etkelîf Strok / S2-S1)	Before Adjustment (Ayar Öncesi)	-	-	-	-	-	-		
	After Adjustment (Ayar Sonrası)	28,63	28,63	28,63	28,63	28,63	28,63		
Injection Angle (degree) (Ateşleme Derecesi / D1+D2)	Found (Bulunan Değer)	23,30	23,30	23,20	23,50	23,50	23,40		
	Original (Orijinal Değer)	23,20	23,30	23,30	23,30	23,40	23,30		
Load index position "0" Spill Valve Lift When Suction Valve Closes. (Rak kolu "0"dayken Suction Valf Kapandığında Spill valf yükselme miktarı)	Found (Bulunan Değer)	2,75							
	Original (Orijinal Değer)	1,20							



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MAIN ENGINE FRESH WATER COOLER COVER RECONDITION;

Regarding to instruction taken from the shif staff, fresh water cooler completely plugged from the cover side. We immediately dismantled the cover, transferred to the workshop. Reconditioned. Later by transferred to the vessel & mounted by ship staff.



MAIN ENGINE TURBOCHARGERS OVERHAUL;

Turbochargers was dismantled and transferred to the TEKNOMARIN's workshop. The components of the T/Cs to be dismantled according to the manufacturers instructions booklet. It is essential to take measurements and record them prior to the rotor dismantling for axial clearances and radial clearances. Disassembling of all the individual parts such us turbine and compressor wheels, nozzle ring etc. Meticulous cleaning of all the individual parts. Rotor alignment check is to be carried out, before the dynamic balancing. The setting data dimensions of the constructors are utilized for the balancing operation and all readings before and after corrections are recorded. The assembling. Following the assembly, according to makers instructions, all readings are taken and recorded. Mounted on stu.





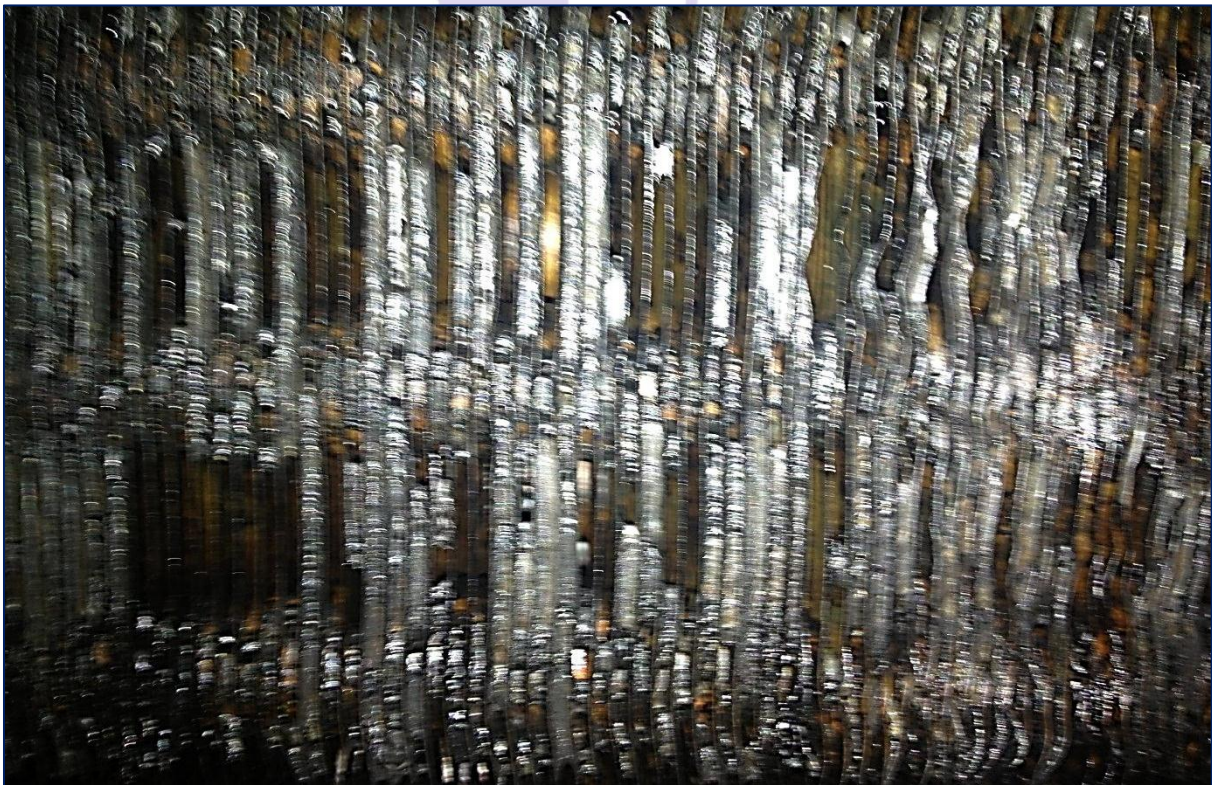
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MAIN ENGINE AIR COOLERS CLEANING & OVERHAUL;

Air coolers dismantled and transferred to the TEKNOMARIN's workshop. Air cooler air side and sea water side was cleaned & washed chemically. Later by blanded & some of tubes changed. Air cooler transferred to the vessel and mounted on stu.



MAIN ENGINE AUX. BLOWER OVERHAUL;

M/E Aux. Blower has dismantled & transferred to the workshop. Blower disassembled & inspected. Roller bearings has renewed & inside and outside of blower cleaned. Later by Blower balast tested. After that transferred to the vessel & mounted on stu.



MAIN ENGINE EXHAUST EXPANSION REPAIR & OVERHAUL;

All exhaust expansions belongs to Main Engine, inspected. Two of them spotted as damaged toughly from welding lines. These expansions dismantled & transferred to the workshop. Meanwhile spare expansions mounted on stu. Later by reconditioned expansions transferred to the vessel and kept as spare.

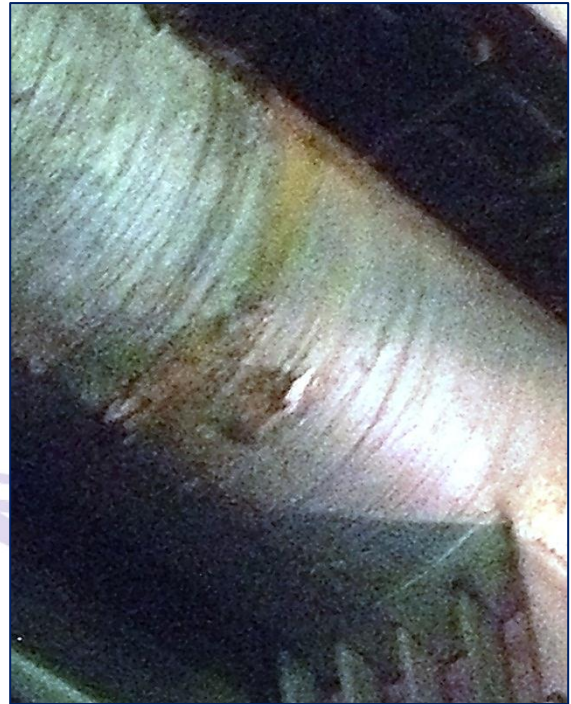






MAIN ENGINE EXHAUST MANIFOLD ISOLATION;

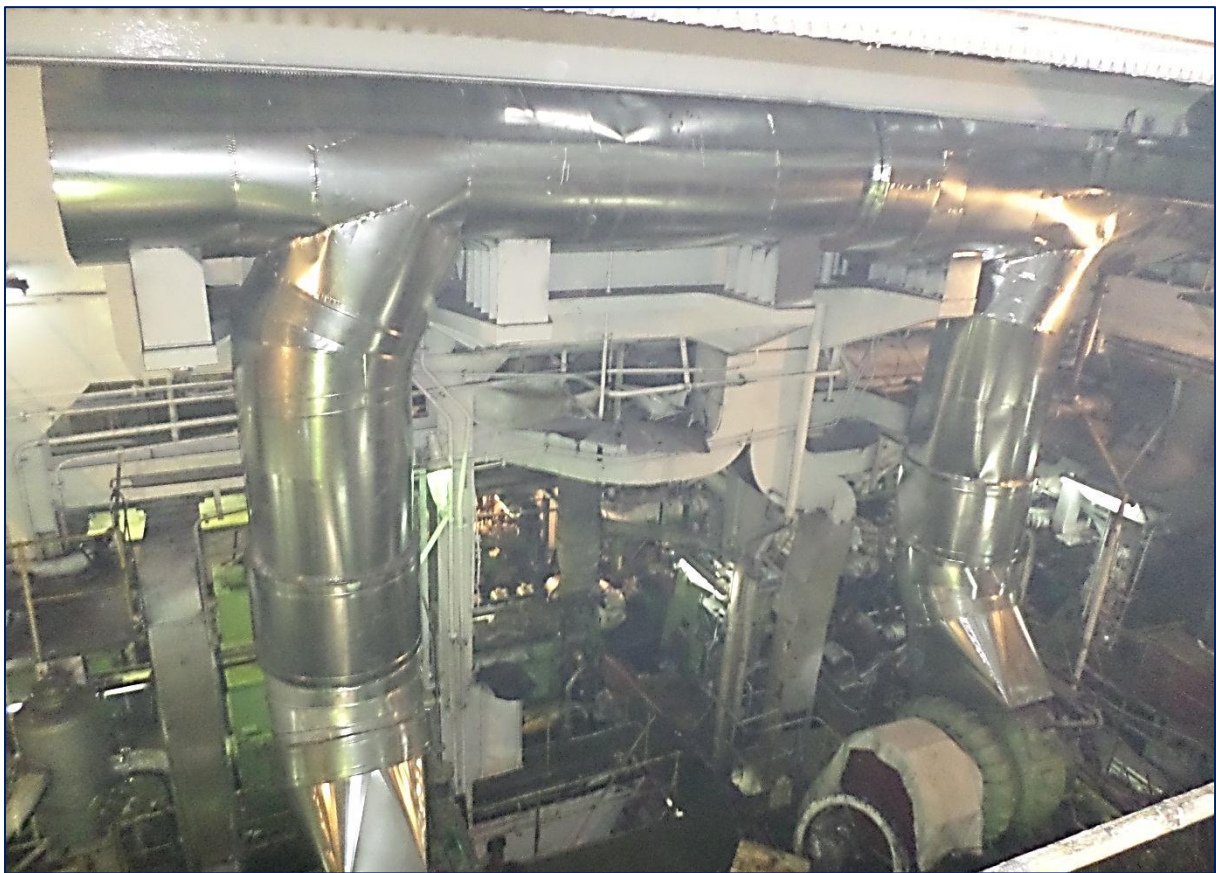
Regarding to our test & inspect, all parts and every spots of main engine exhaust manifold, must be renewed and re-isolation. After the building scaffold to the engine room, we immediately started to isolate and cover the main engine exhaust manifold completely.



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SHIP REPAIR CONVERTING DRY DOCKING HYDRAULIC
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MAIN ENGINE FRESH WATER DAERATION TANK;

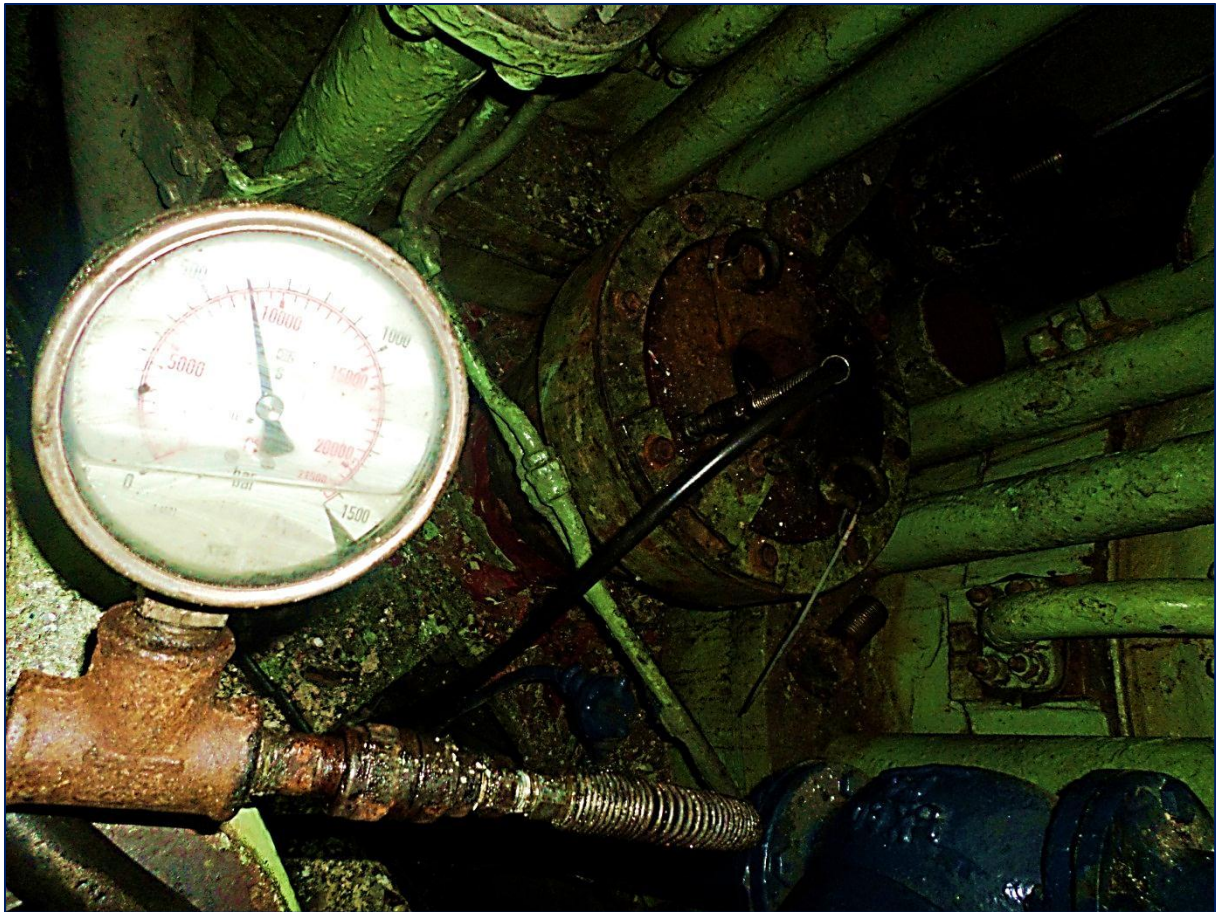
Regarding to our inspect main engine fresh water daeration tank has leakage in some parts and stuffed completely. In the light of this inspection, we dismantled the tank as sample and fabricated new one same as old. With new drain valve, gaskets, bolts & nuts, foundation fitting and pipes fitting, new fresh water daeration tank is ready for order.



MAIN ENGINE TIEROD JACKS OVERHAUL;

There were two tierod jacks of main engine tierods in vessel. We transferred to the workshop for inspection & overhaul if necessary. Tierod jacks tightened & controlled. After the control of jacks, they are transferred to the vessel & checked on M/E itself with 600 bar. Operative.





Meanwhile these jacks test was an opportunity for the controlling tierods of main engine. In that moment we tighted & controlled all tierods of main engine immediately with 600 bar.



AUXILIARY ENGINES PARTICULARS

GENERATOR ENGINE NO:1/2/3

HITACHI B&W 6323HH;

BHP – 720

4 CYCLE SINGLE ACTING

RPM – 720

ENGINE NO. 6046

DATE : 2/20/73

GENERATOR ENGINE NO:4

YANMAR T260L-ST;

CONT.RATING – 1300 HP

4 CYCLE SINGLE ACTING

RPM – 720

ENGINE NO. 0066 FHF

GENERATOR ENGINE NO:5

MAN B&W 6L23/30;

KW – 780

4 CYCLE SINGLE ACTING

RPM – 720

MEP – 18.2 BAR

ENGINE NO. 21843

YEAR: 2002



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SHIP REPAIR CONVERTING DRY DOCKING HYDRAULIC
PNEUMATIC MECHANIC ELECTRIC SPARE PART (NEW & USED)



GENERATOR ENGINE NO:1

HITACHI B&W 6323HH;

G/E NO:1 CYLINDER HEADS OVERHAUL;

All connections of cylinder heads dismantled. All cylinder heads removed from the engine for overhaul. All safety valves, starting valves and Indicator valves overhauled and tested. Indicator cocks overhauled and tested. Rocker arms dismantled, shafts and bushes measured. All inlet and exhaust valves, guides and seats were grinded and lapped. All o-rings in cylinder heads were replaced. Cylinder covers water side cleaned by chemically and hydrostatic pressure tested. Cylinder heads mounted on stu.



G/E NO:1 PISTONS OVERHAUL;

All pistons dismantled, taken out for inspection and measuring the big end bore ovality, small end bush, piston pin, piston ring grooves, piston pin boss. Piston crowns and skirts checked for possible cracks by dye penetrant. After taken out of measurements, all piston rings were replaced with new piston rings.



Later by all connectin rods dismantled from pistons & measured one by one. We noticed that all connectin rods needs boring. All connectin rod bearings fabricated according to last measures taken by TEKNOMARIN technicians. Meanwhile connectin rod boring also finished & also rods delivered to the vessel, following all connectin rods with piston crowns mounted on stu. Meanwhile boring has started for connectin rods when liners disassembled.



G/E NO:1 LINERS OVERHAUL;

All cylinder liners were dismantled. All liners cleaned, inspected and measured. After measurements and inspections, liners prepared to be re-fitted with new o-rings. Meanwhile liners were already honned and delivered to the vessel and shifted to engine room. Honned liners mounted on block with new o-rings & gaskets that exist supplied from ship store by vessel crew. Missing o-rings & gaskets fabricated by TEKNOMARIN technicians as samples. All liners prepared to mounted on stu.



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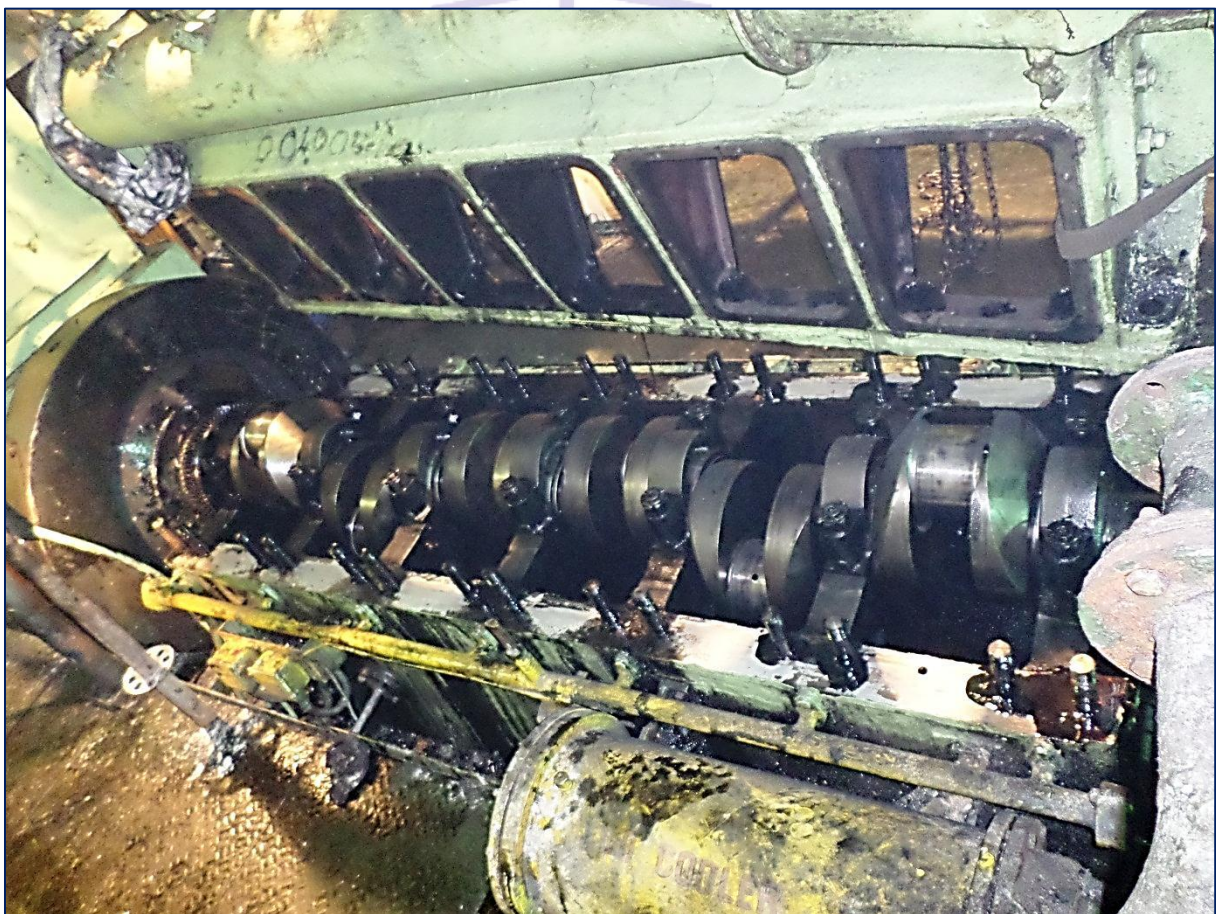
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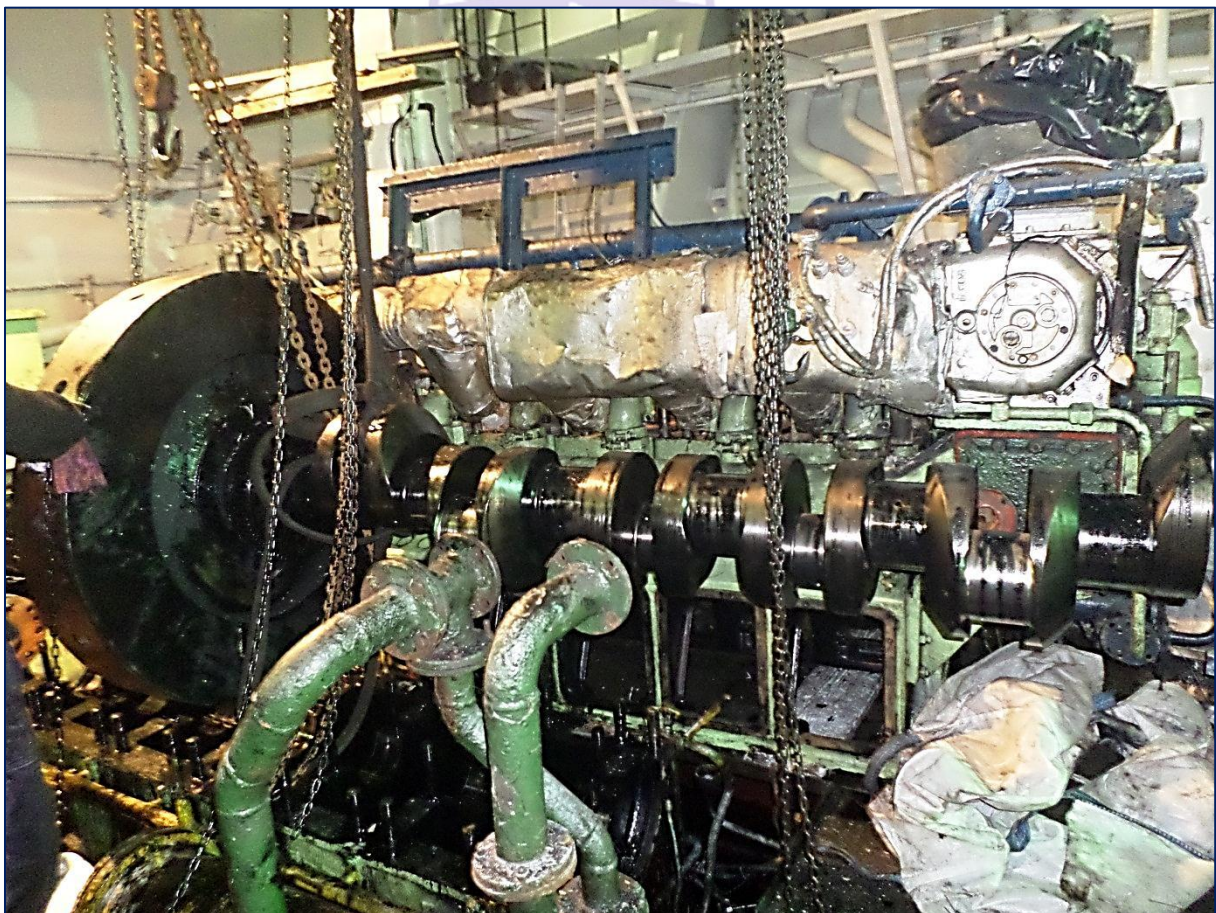


G/E NO:1 CRANKSHAFT INSPECTION & ENGINE BLOCK SHIFTING;

Block completely lifted & shifted in engine room. Alternator also slightly shifted in engine room by vessel crew. Crankshaft has dismantled & transferred to the workshop & inspected. Also measured. After inspection and measurements, cracks and under/oversized bearings noticed & marked. Bedplate boring & main bearing fabricating immediately started and finished. Grinding, boring, welding and fabricating jobs for crankshaft has done and all measurements taken once again and engine started to assembly. After the flywheel studs fabrication, crankshaft mounted and assembled with flywheel in stu. Alternator slightly shifted once again to be connected with crankshaft. In the meantime, deflection of crankshaft has been taken and lined with alternator's rotor. Engine block & jackets inspected for cracks. Found none. Thus engine block immediately mounted & lined with the bedplate.







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G/E NO:1 CRANKSHAFT GRINDING & BEARINGS BORING;

When the block was dismantled & shifted, crankshaft and main bearings was ready for inspection. Crankshaft also dismantled & transferred to the workshop for measurements. After inspection, we noticed that crankshaft needs to grind, bearings needs to boring. Later by measures has taken then we immediately start the boring job for main bearings.



G/E NO:1 TURBOCHARGER OVERHAUL;

Turbocharger was dismantled and transferred to the TEKNOMARIN's workshop. The components of the T/C to be dismantled according to the manufacturers instructions booklet. It is essential to take measurements and record them prior to the rotor dismantling for axial clearances and radial clearances. Disassembling of all the individual parts such as turbine and compressor wheels, nozzle ring etc. Meticulous cleaning of all the individual parts. Rotor alignment check is to be carried out, before the dynamic balancing. The setting data dimensions of the constructors are utilized for the balancing operation and all readings before and after corrections are recorded. The assembling. Following the assembly, according to makers instructions, all readings are taken and recorded. Mounted on stu.

G/E NO:1 GOVERNOR OVERHAUL;

Governor has dismantled from the Generator Engine No:1 and transferred to the workshop. Later by governor has disassembled and checked as inspection. All clutch, lever & bracket system inspected & tested. Shaft & sleeve assemblies checked. Also governor block, bushings & springs inspected & assembled once again. Transferred to the vessel & mounted on stu.

G/E NO:1 LUB.OIL COOLER & AIR COOLER OVERHAUL;

Lub. Oil Cooler dismantled & transferred to the workshop. Air cooler dismantled & transferred to the workshop for chemically cleaning, some of the special studs of coolers fabricated cause of their condition was bad. After the cleaning and check, coolers mounted on stu.

G/E NO:1 ASSEMBLY & TEST;

After the main bearing boring bedplate, main bearings & alternator lined when grinded crankshaft mounted. Block lifted & shifted to the bedplate. Honned liners mounted with new o-rings & gaskets brought by vessel crew. Later by measured & reconditioned pistons mounted. All connectin rods mounted to the crankshaft with new bearings & security locks. Reconditioned cylinder heads mounted, all inlets & exhausts gaskets fabricated & renewed on stu. All connections has assembled, lub.oil cooler & air cooler mounted after mounting T/C. Generator Engine No:1 is ready for test. After the completion of sump tank oil delivery & block water, G/E No:1 has started & tested. Finalized.

Operative.



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GENERATOR ENGINE NO:2

HITACHI B&W 6323HH;

G/E NO:2 CYLINDER HEADS OVERHAUL;

All connections of cylinder heads dismantled. All cylinder heads removed from the engine for overhaul. All safety valves, starting valves and Indicator valves overhauled and tested. Indicator cocks overhauled and tested. Rocker arms dismantled, shafts and bushes measured. All inlet and exhaust valves, guides and seats were grinded and lapped. All o-rings in cylinder heads were replaced. Cylinder covers water side cleaned by chemically and hydrostatic pressure tested. Cylinder heads mounted on stu.

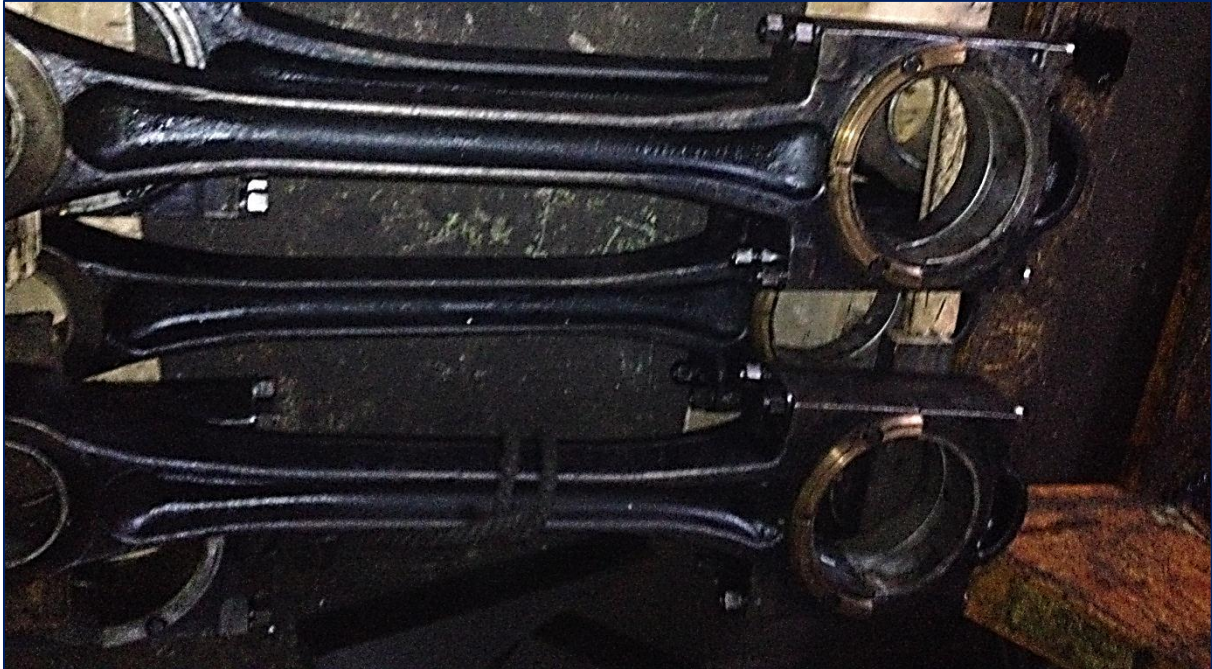


G/E NO:2 PISTONS OVERHAUL;

All pistons dismantled, taken out for inspection and measuring the big end bore ovality, small end bush, piston pin, piston ring grooves, piston pin boss. Piston crowns and skirts checked for possible cracks by dye penetrant. After taken out of measurements, all piston rings were replaced with new piston rings.



Later by all connectin rods dismantled from pistons & measured one by one. All connectin rod bearings fabricated according to last measures taken by TEKNOMARIN technicians. Meanwhile connectin rod ovality control and with & without bearing measures has already taken. Later by delivered to the vessel, following all connectin rods with piston crowns mounted on stu. Meanwhile boring has started for connectin rods when liners disassembled.



G/E NO:2 LINERS OVERHAUL;

All cylinder liners were dismantled. All liners cleaned, inspected and measured. After measurements and inspections, liners prepared to be re-fitted with new o-rings. Meanwhile liners were already honned and delivered to the vessel and shifted to engine room. Honned liners mounted on block with new o-rings & gaskets that exist supplied from ship store by vessel crew. Missing o-rings & gaskets fabricated by TEKNOMARIN technicians as samples. All liners prepared to mounted on stu.



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SHIP REPAIR CONVERTING DRY DOCKING HYDRAULIC
PNEUMATIC MECHANIC ELECTRIC SPARE PART (NEW & USED)





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SHIP REPAIR CONVERTING DRY DOCKING HYDRAULIC
PNEUMATIC MECHANIC ELECTRIC SPARE PART (NEW & USED)





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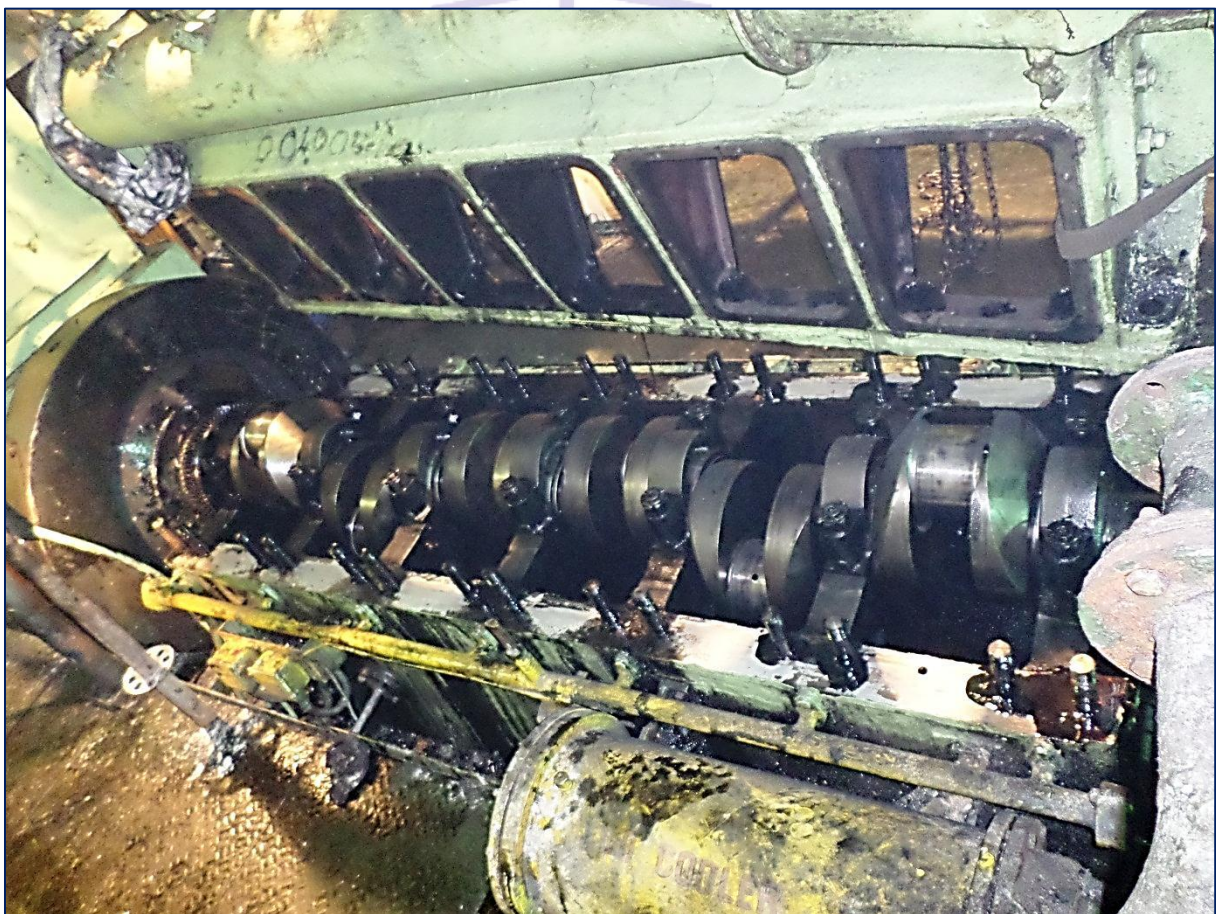
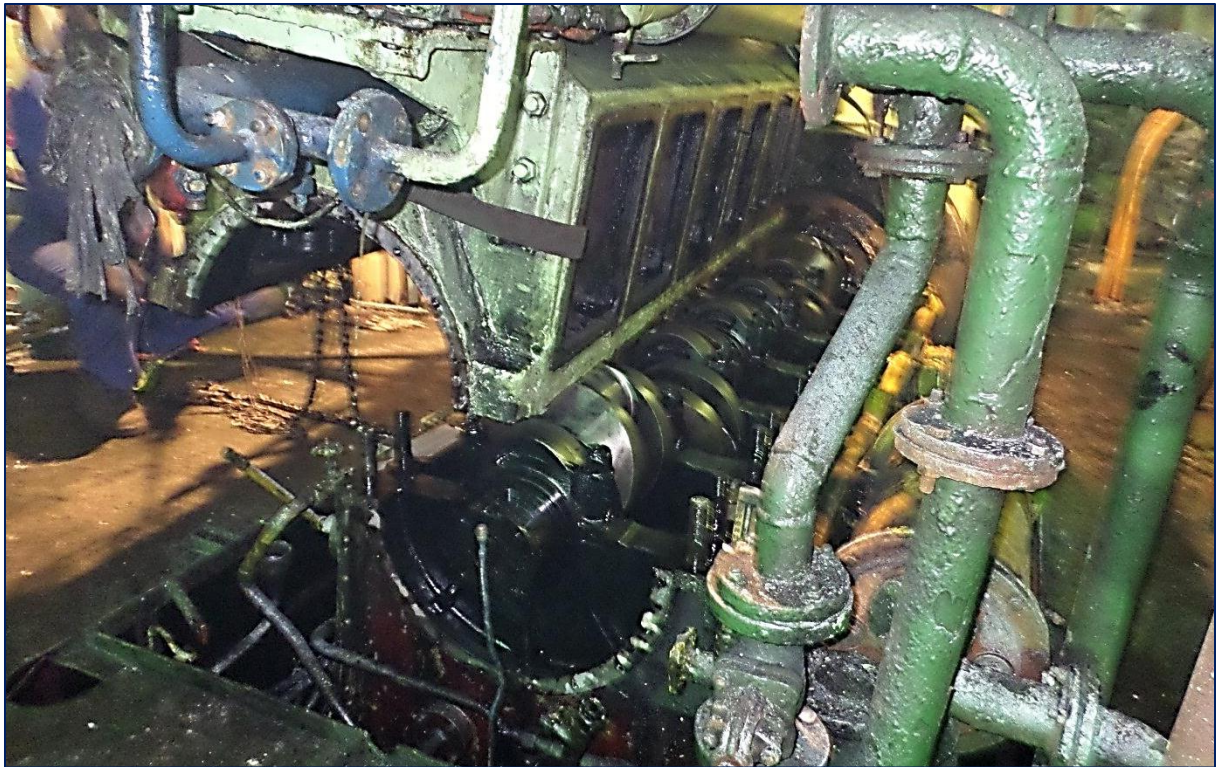
SHIP REPAIR CONVERTING DRY DOCKING HYDRAULIC
PNEUMATIC MECHANIC ELECTRIC SPARE PART (NEW & USED)

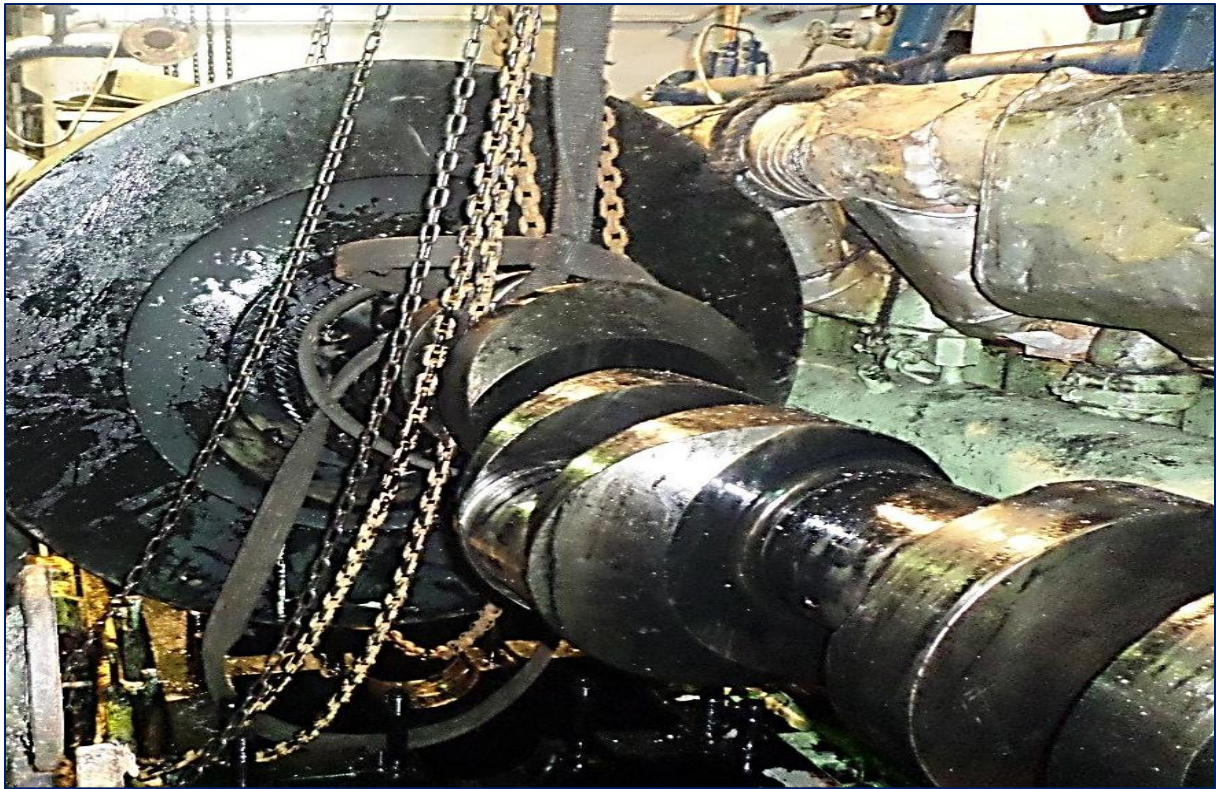


G/E NO:2 CRANKSHAFT INSPECTION & ENGINE BLOCK SHIFTING;

Block completely lifted & shifted in engine room. Alternator also slightly shifted in engine room by vessel crew. Crankshaft has dismantled & transferred to the workshop & inspected. Also measured. After inspection and measurements, cracks and under/oversized bearings noticed & marked. Bedplate boring & main bearing fabricating immediately started and finished. Grinding, boring, welding and fabricating jobs for crankshaft has done and all measurements taken once again and engine started to assembly. After the flywheel studs fabrication, crankshaft mounted and assembled with flywheel in stu. Alternator slightly shifted once again to be connected with crankshaft. In the meantime, deflection of crankshaft has been taken and lined with alternator's rotor. Engine block & jackets inspected for cracks. Found none. Thus engine block immediately mounted & lined with the bedplate.







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PNEUMATIC MECHANIC ELECTRIC SPARE PART (NEW & USED)



G/E NO:2 CRANKSHAFT GRINDING & BEARINGS BORING;

When the block was dismantled & shifted, crankshaft and main bearings was ready for inspection. Crankshaft also dismantled & transferred to the workshop for measurements. After inspection, we noticed that crankshaft needs to grind, bearings needs to boring. Later by measures has taken then we immediately start the boring job for main bearings.



G/E NO:2 TURBOCHARGER OVERHAUL;

Turbocharger was dismantled and transferred to the TEKNOMARIN's workshop. The components of the T/C to be dismantled according to the manufacturers instructions booklet. It is essential to take measurements and record them prior to the rotor dismantling for axial clearances and radial clearances. Disassembling of all the individual parts such as turbine and compressor wheels, nozzle ring etc. Meticulous cleaning of all the individual parts. Rotor alignment check is to be carried out, before the dynamic balancing. The setting data dimensions of the constructors are utilized for the balancing operation and all readings before and after corrections are recorded. The assembling. Following the assembly, according to makers instructions, all readings are taken and recorded. Mounted on stu.

G/E NO:2 GOVERNOR OVERHAUL;

Governor has dismantled from the Generator Engine No:2 and transferred to the workshop. Later by governor has disassembled and checked as inspection. All clutch, lever & bracket system inspected & tested. Shaft & sleeve assemblies checked. Also governor block, bushings & springs inspected & assembled once again. Transferred to the vessel & mounted on stu.

G/E NO:2 LUB.OIL COOLER & AIR COOLER OVERHAUL;

Lub. Oil Cooler dismantled & transferred to the workshop. Air cooler dismantled & transferred to the workshop for chemically cleaning, some of the special studs of coolers fabricated cause of their condition was bad. After the cleaning and check, coolers mounted on stu.

G/E NO:2 ASSEMBLY & FINALIZE;

After the main bearing boring bedplate, main bearings & alternator lined when grinded crankshaft mounted. Block lifted & shifted to the bedplate. Honned liners mounted with new o-rings & gaskets brought by vessel crew. Later by measured & reconditioned pistons mounted. All connecting rods mounted to the crankshaft with new bearings & security locks. Reconditioned cylinder heads mounted, all inlets & exhausts gaskets fabricated & renewed on stu. All connections has assembled, lub.oil cooler & air cooler mounted after mounting T/C. Generator Engine No:2 is ready for test. After the completion of sump tank oil delivery & block water, G/E No:2 has started & tested. Finalized.

Operative.



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SHIP REPAIR CONVERTING DRY DOCKING HYDRAULIC
PNEUMATIC MECHANIC ELECTRIC SPARE PART (NEW & USED)



GENERATOR ENGINE NO:3

HITACHI B&W 6323HH;

G/E NO:3 CYLINDER HEADS OVERHAUL;

All connections of cylinder heads dismantled. All cylinder heads removed from the engine for overhaul. All safety valves, starting valves and Indicator valves overhauled and tested. Indicator cocks overhauled and tested. Rockerarms dismantled, shafts and bushes measured. All inlet and exhaust valves, guides and seats were grinded and lapped. All o-rings in cylinder heads were replaced. Cylinder covers water side cleaned by chemically and hydrostatic pressure tested. Cylinder heads mounted on stu.



G/E NO:3 PISTONS OVERHAUL;

All pistons dismantled, taken out for inspection and measuring the big end bore ovality, small end bush, piston pin, piston ring grooves, piston pin boss. Piston crowns and skirts checked for possible cracks by dye penetrant. After taken out of measurements, all piston rings were replaced with new piston rings.



Later by all connectin rods dismantled from pistons & measured one by one. Meanwhile connectin rod ovality control and with & without bearing measures has already taken .We noticed that all connectin rods needs boring after measures. All connectin rod bearings fabricated according to last measures taken by TEKNOMARIN technicians. Meanwhile connectin rod boring also finished & also rods delivered to the vessel, following all connectin rods with piston crowns mounted on stu. Meanwhile boring has started for connectin rods when liners disassembled.



G/E NO:3 LINERS OVERHAUL;

All cylinder liners were dismantled. All liners cleaned, inspected and measured. After measurements and inspections, liners prepared to be re-fitted with new o-rings. Meanwhile liners were already honned and delivered to the vessel and shifted to engine room. Honned liners mounted on block with new o-rings & gaskets that exist supplied from ship store by vessel crew. Missing o-rings & gaskets fabricated by TEKNOMARIN technicians as samples. All liners prepared to mounted on stu.



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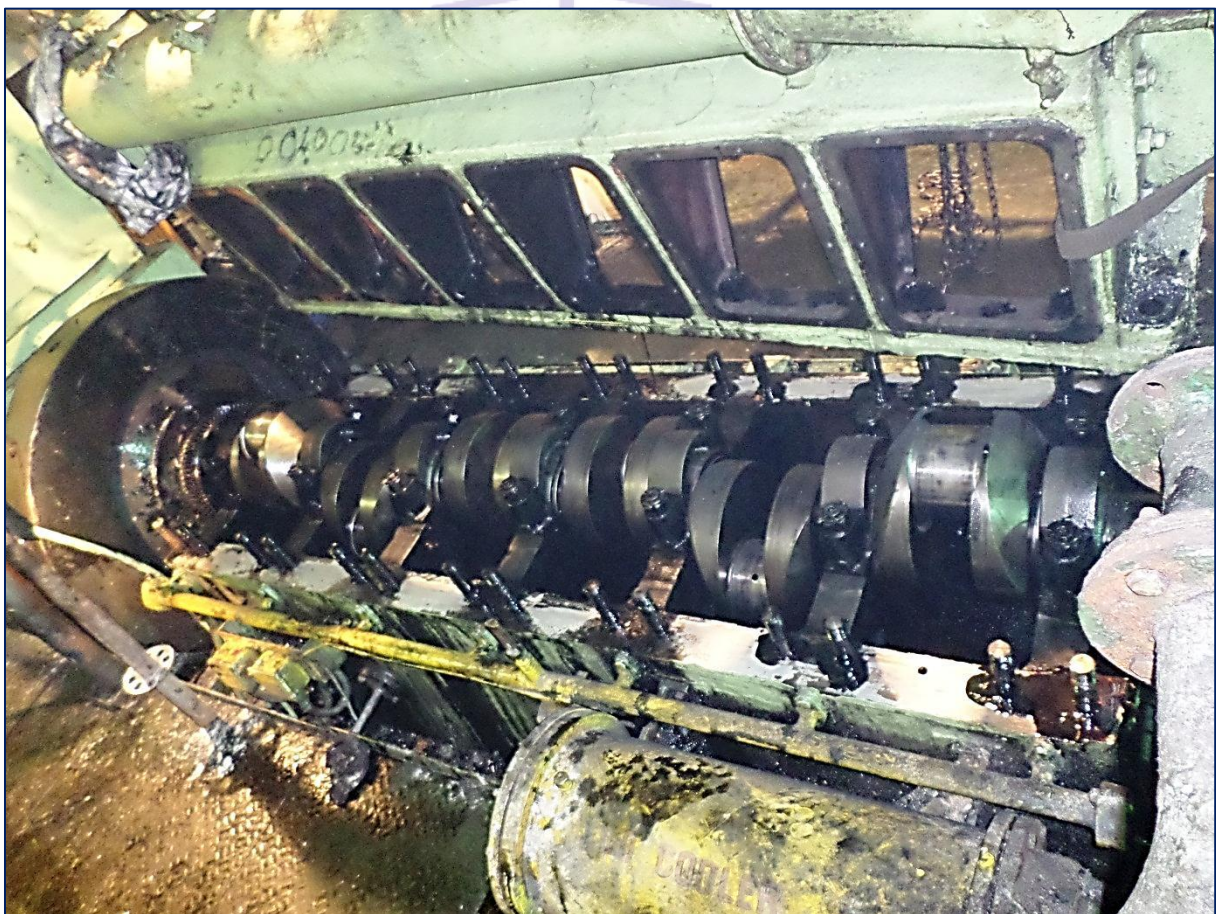
SHIP REPAIR CONVERTING DRY DOCKING HYDRAULIC
PNEUMATIC MECHANIC ELECTRIC SPARE PART (NEW & USED)



G/E NO:3 CRANKSHAFT INSPECTION & ENGINE BLOCK SHIFTING;

Block completely lifted & shifted in engine room. Alternator also slightly shifted in engine room by vessel crew. Crankshaft has dismantled & transferred to the workshop & inspected. Also measured. After inspection and measurements, cracks and under/oversized bearings noticed & marked. Also we noticed that two of the top cap has cracked. Welding job has started for the cracked top cap. Bedplate boring & main bearing fabricating immediately started and finished. Grinding, boring, welding and fabricating jobs for crankshaft has done and all measurements taken once again and engine started to assembly. After the flywheel studs fabrication, crankshaft mounted and assembled with flywheel in stu. Alternator slightly shifted once again to be connected with crankshaft. In the meantime, deflection of crankshaft has been taken and lined with alternator's rotor. Engine block & jackets inspected for cracks. Found none. Thus engine block immediately mounted & lined with the bedplate.

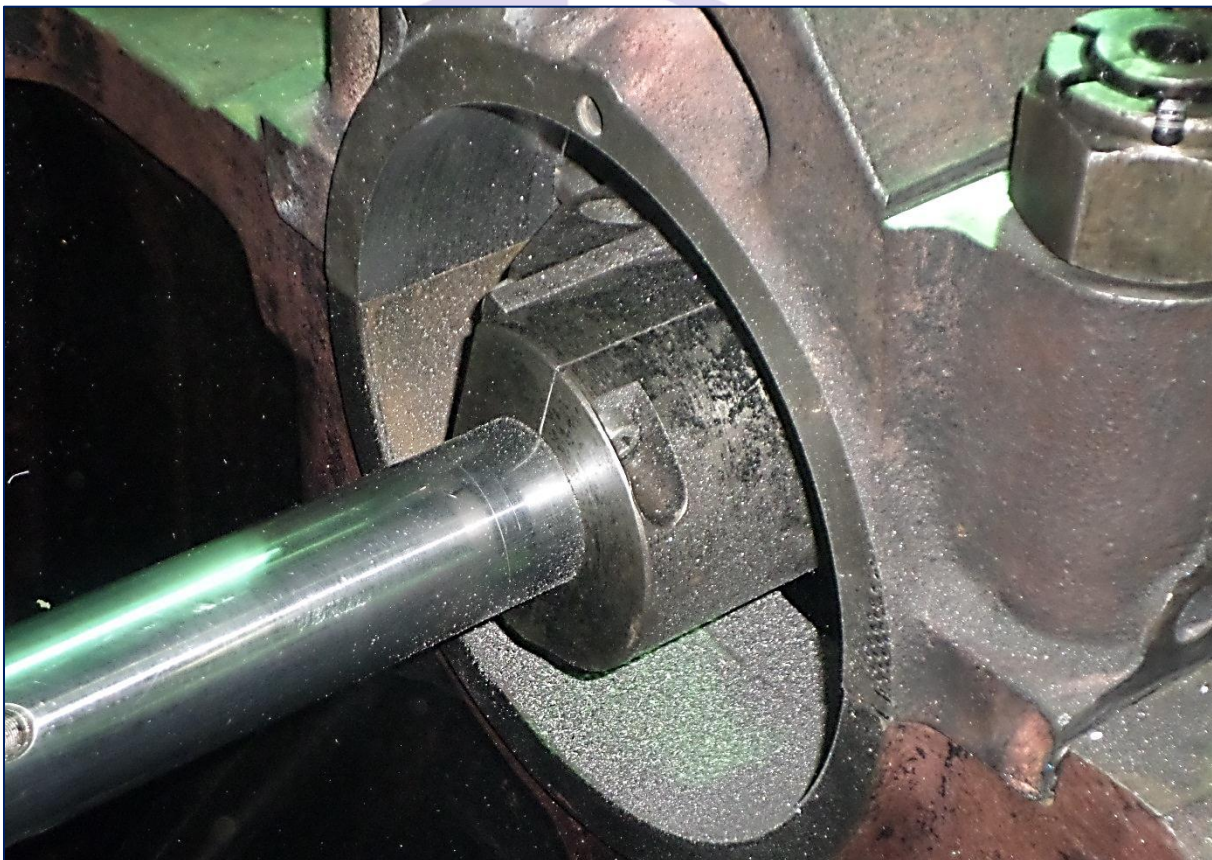




G/E NO:3 CRANKSHAFT GRINDING & BEARINGS BORING;

When the block was dismantled & shifted, crankshaft and main bearings was ready for inspection. Crankshaft also dismantled & transferred to the workshop for measurements. After inspection, we noticed that crankshaft needs to grind, bearings needs to boring. Later by measures has taken then we immediately start the boring job for main bearings.





G/E NO:3 TURBOCHARGER OVERHAUL;

Turbocharger was dismantled and transferred to the TEKNOMARIN's workshop. The components of the T/C to be dismantled according to the manufacturers instructions booklet. It is essential to take measurements and record them prior to the rotor dismantling for axial clearances and radial clearances. Disassembling of all the individual parts such as turbine and compressor wheels, nozzle ring etc. Meticulous cleaning of all the individual parts. Rotor alignment check is to be carried out, before the dynamic balancing. The setting data dimensions of the constructors are utilized for the balancing operation and all readings before and after corrections are recorded. The assembling. Following the assembly, according to makers instructions, all readings are taken and recorded. Mounted on stu.

G/E NO:3 GOVERNOR OVERHAUL;

Governor has dismantled from the Generator Engine No:3 and transferred to the workshop. Later by governor has disassembled and checked as inspection. All clutch, lever & bracket system inspected & tested. Shaft & sleeve assemblies checked. Also governor block, bushings & springs inspected & assembled once again. Transferred to the vessel & mounted on stu.

G/E NO:3 LUB.OIL COOLER & AIR COOLER OVERHAUL;

Lub. Oil Cooler dismantled & transferred to the workshop. Air cooler dismantled & transferred to the workshop for chemically cleaning, some of the special studs of coolers fabricated cause of their condition was bad. After the cleaning and check, coolers mounted on stu.

G/E NO:3 ASSEMBLY & TEST;

After the main bearing boring bedplate, main bearings & alternator lined when grinded crankshaft mounted. Block lifted & shifted to the bedplate. Honned liners mounted with new o-rings & gaskets brought by vessel crew. Later by measured & reconditioned pistons mounted. All connectin rods mounted to the crankshaft with new bearings & security locks. Reconditioned cylinder heads mounted, all inlets & exhausts gaskets fabricated & renewed on stu. All connections has assembled, lub.oil cooler & air cooler mounted after mounting T/C. Generator Engine No:3 is ready for test. After the completion of sump tank oil delivery & block water, G/E No:3 has started & tested. Finalized.

Operative.



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PNEUMATIC MECHANIC ELECTRIC SPARE PART (NEW & USED)



GENERATOR ENGINE NO:4

YANMAR T260L-ST;

G/E NO:4 CYLINDER HEADS OVERHAUL;

All connections of cylinder heads dismantled. All cylinder heads removed from the engine for overhaul. All safety valves, starting valves and Indicator valves overhauled and tested. Indicator cocks overhauled and tested. Rockerarms dismantled, shafts and bushes measured. All inlet and exhaust valves, guides and seats were grinded and lapped. All o-rings in cylinder heads were replaced. Cylinder covers water side cleaned by chemically and hydrostatic pressure tested. Cylinder heads mounted on stu.

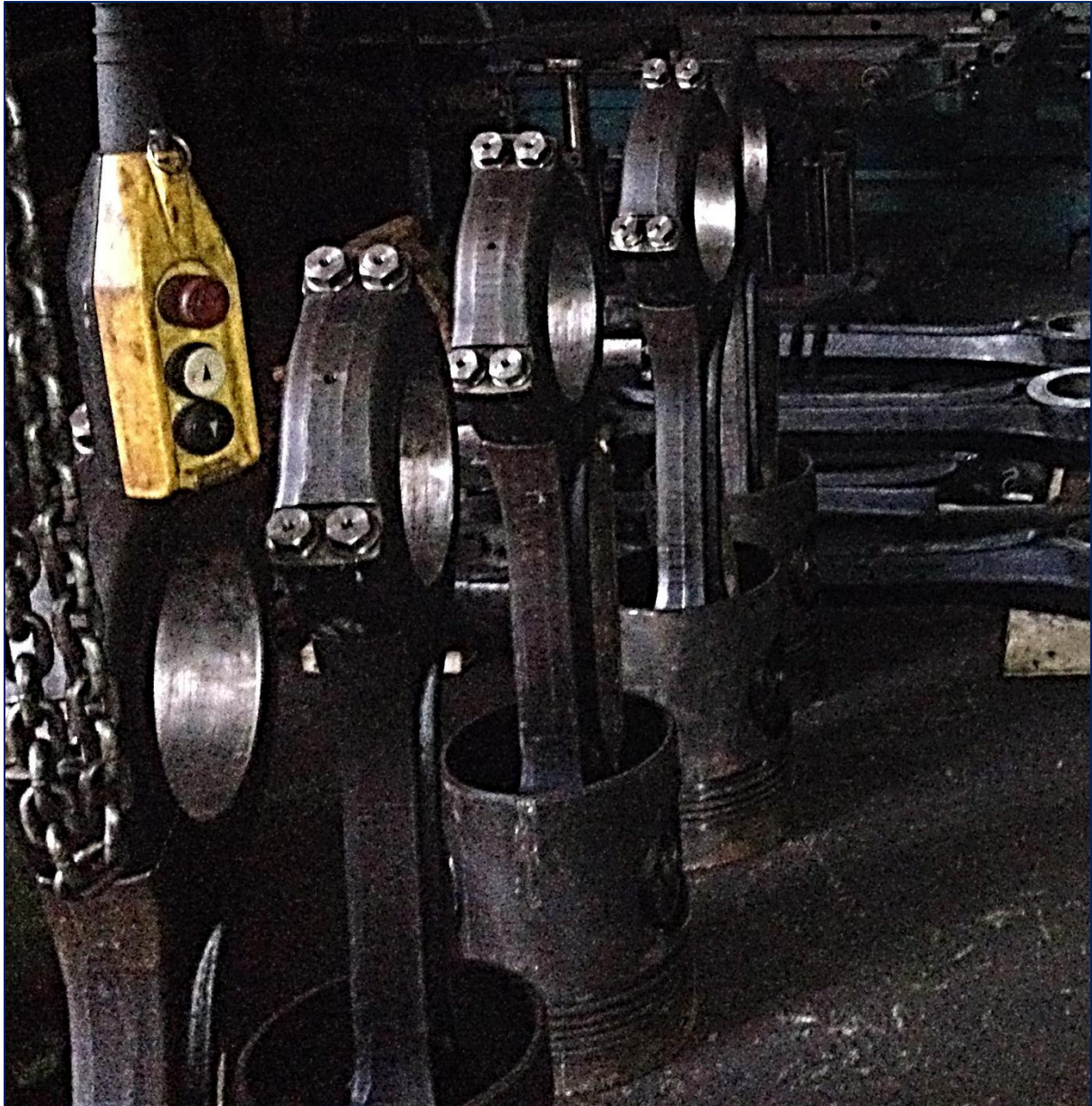


G/E NO:4 PISTONS OVERHAUL;

All pistons dismantled, taken out for inspection and measuring the big end bore ovality, small end bush, piston pin, piston ring grooves, piston pin boss. Piston crowns and skirts checked for possible cracks by dye penetrant. After taken out of measurements, all piston rings were replaced with new piston rings. And all piston reconditioned.



Later by all connectin rods dismantled from pistons & measured one by one including the spare that in vessel. Meanwhile connectin rod ovality control and with & without bearing measures has already taken . We noticed that all connectin rods needs boring after measures. All connectin rod bearings fabricated according to last measures taken by TEKNOMARIN technicians. Meanwhile connectin rod boring also finished & also rods delivered to the vessel, following all connectin rods with piston crowns mounted on stu. Meanwhile boring has started for connectin rods when liners disassembled.





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SHIP REPAIR CONVERTING DRY DOCKING HYDRAULIC
PNEUMATIC MECHANIC ELECTRIC SPARE PART (NEW & USED)



G/E NO:4 LINERS OVERHAUL;

All cylinder liners were dismantled. All liners cleaned, inspected and measured. After measurements and inspections, liners prepared to be re-fitted with new o-rings. Meanwhile liners were already honned and delivered to the vessel and shifted to engine room. Honned liners mounted on block with new o-rings & gaskets that exist supplied from ship store by vessel crew. Missing o-rings & gaskets fabricated by TEKNOMARIN technicians as samples. All liners prepared to mounted on stu.



G/E NO:4 CRANKSHAFT & BLOCK INSPECTION;

Crankshaft deflection has taken. We inspected and taken measurements for under/oversized bearings, engine block & jackets inspected for cracks. Found none.



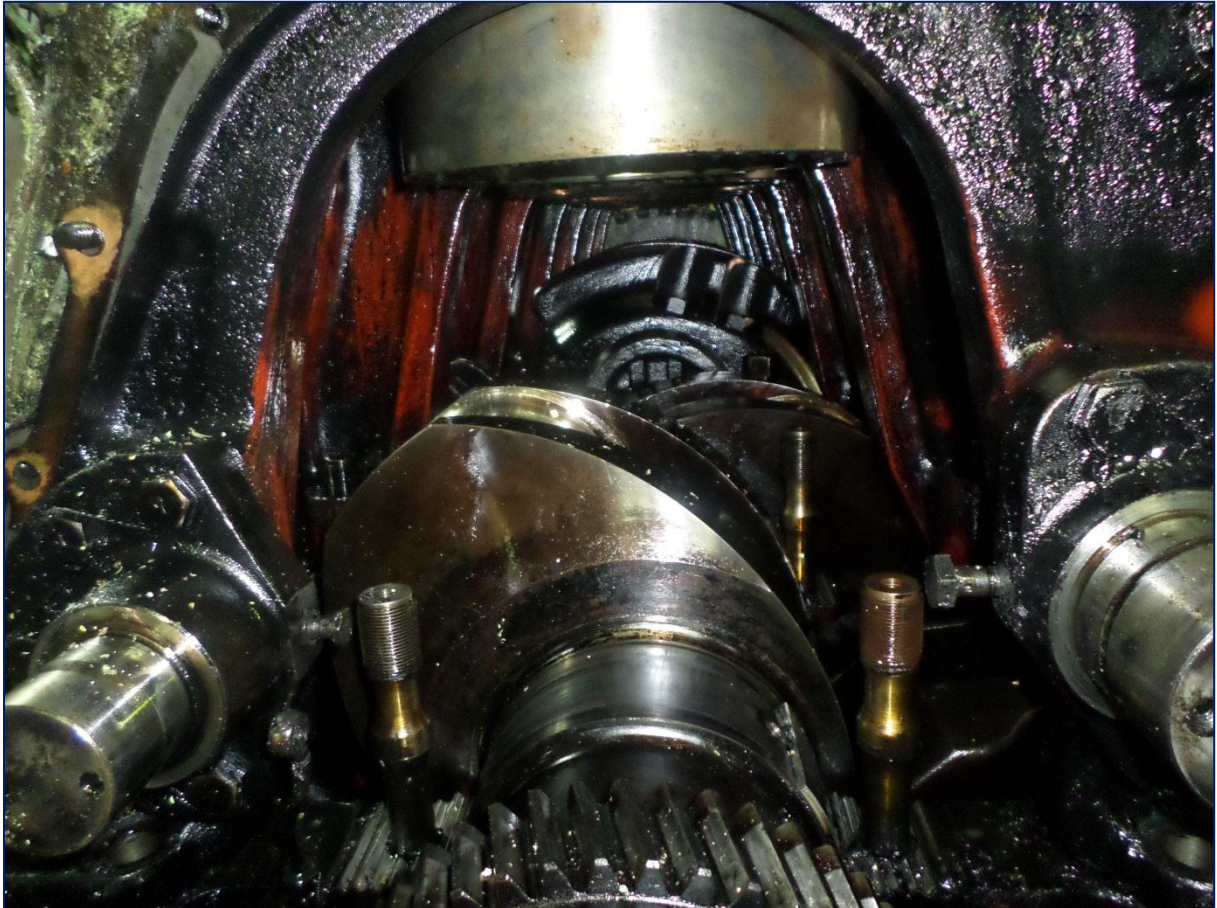
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PNEUMATIC MECHANIC ELECTRIC SPARE PART (NEW & USED)



G/E NO:4 BLOCK LIFTING & CRANKSHAFT DISMOUNTING;

Regarding to our inspection with Generator Engine No:4 Crankshaft, we noticed that the crankshaft non-flywheel sides bushes has broken & there was some bending on crankshaft & should be boring. After the dismantling of crankshaft, it has transferred to the workshop & main bearing, crankshaft boring job has already started.



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G/E NO:4 ALTERNATOR REWINDING;

Regarding to our inspection with Generator Engine No:4 Alternator, we noticed that the alternator was burned & should be rewind. Cause of the place & terms, rewind must to be on stu. After the measurements & continuos inspection, alternator has disassembled & rotor has been taken out. Alternator rewinding started immediately, after the completion of rewinding, mounted on stu & tested. **Operative.**





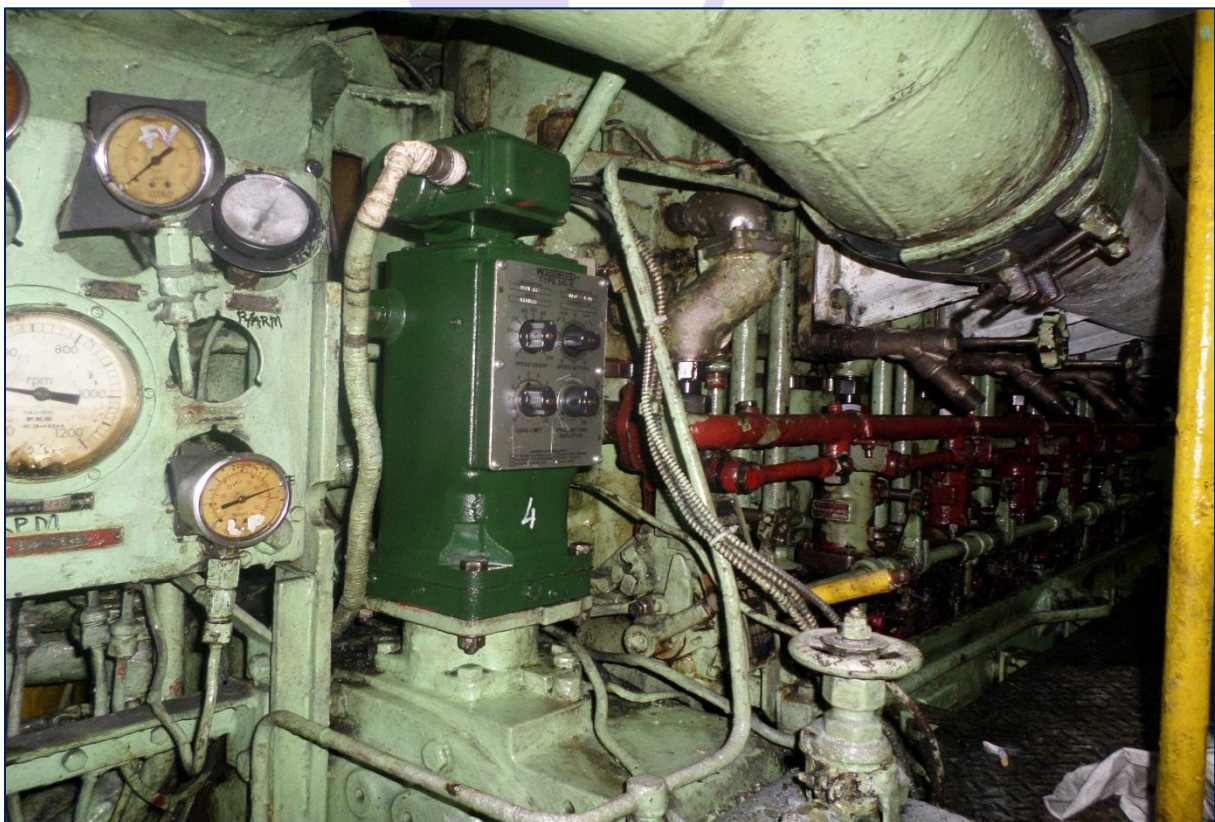


G/E NO:4 TURBOCHARGER OVERHAUL;

Turbocharger was dismantled and transferred to the TEKNOMARIN's workshop. The components of the T/C to be dismantled according to the manufacturers instructions booklet. It is essential to take measurements and record them prior to the rotor dismantling for axial clearances and radial clearances. Disassembling of all the individual parts such as turbine and compressor wheels, nozzle ring etc. Meticulous cleaning of all the individual parts. Rotor alignment check is to be carried out, before the dynamic balancing. The setting data dimensions of the constructors are utilized for the balancing operation and all readings before and after corrections are recorded. The assembling. Following the assembly, according to makers instructions, all readings are taken and recorded. Mounted on stu.

G/E NO:4 GOVERNOR OVERHAUL;

Governor has dismantled from the Generator Engine No:4 and transferred to the workshop. Later by governor has disassembled and checked as inspection. All clutch, lever & bracket system inspected & tested. Shaft & sleeve assemblies checked. Also governor block, bushings & springs inspected & assembled once again. Transferred to the vessel & mounted on stu.



G/E NO:4 LUB.OIL COOLER OVERHAUL;

Lub. Oil Cooler dismantled & transferred to the workshop for chemically cleaning, some of the special studs of coolers fabricated cause of their condition was bad. After the cleaning and check, cooler mounted on stu.

G/E NO:4 ASSEMBLY & TEST;

After the overhaul of liners, pistons, cylinder heads, alternator rewinding & alternator lined. Honned liners mounted with new o-rings & gaskets brought by vessel crew. Later by measured & reconditioned pistons mounted. All connectin rods mounted to the crankshaft. Reconditioned cylinder heads mounted, all inlets & exhausts gaskets fabricated & renewed on stu. All connections has assembled, lub.oil cooler mounted after mounting T/C. Generator Engine No:4 is ready for test. After the completion of sump tank oil delivery & block water, G/E No:4 has started & tested. Finalized. **Operative.**



ENGINE ROOM AUX. MACHINERIES

PUMPS

List of the pumps that reconditioned by TEKNOMARIN;

COUPLED PUMPS;

- *G/E No:1 Coupled Lub.Oil Pump
- *G/E No:2 Coupled Lub.Oil Pump
- *G/E No:3 Coupled Lub.Oil Pump
- *G/E No:4 Coupled Lub.Oil Pump
- *G/E No:4 Coupled Fresh Water Pump

INDEPENDENT PUMPS;

- *M/E Sea Water Pump No:1
- *M/E Sea Water Pump No:2
- *Auxiliary Engine Sea Water Pump No:1
- *Auxiliary Engine Sea Water Pump No:2
- *Ballast Pump
- *Sanitary Pump
- *D/O Transfer Pump
- *F/O Transfer Pump
- *General Service Pump
- *Fire/Bilge Pump
- *Scrubber Pump
- *Piston Cooling Fresh Water Pump No:1
- *Piston Cooling Fresh Water Pump No:2
- *Jacket Cooling Fresh Water Pump No:1
- *Jacket Cooling Fresh Water Pump No:2
- *AC Sea Water Pump
- *Boiler Feed Water Pump No:1
- *Boiler Feed Water Pump No:2
- *Hydrophore Pump No:1
- *Hydrophore Pump No:2
- *F/O Burning Pump No:1
- *F/O Burning Pump No:2
- *Evaporator Sea Water Pump No:1
- *Evaporator Sea Water Pump No:2
- *G/E No:5 Sea Water Pump No:1
- *G/E No:5 Sea Water Pump No:2



COUPLED PUMPS;

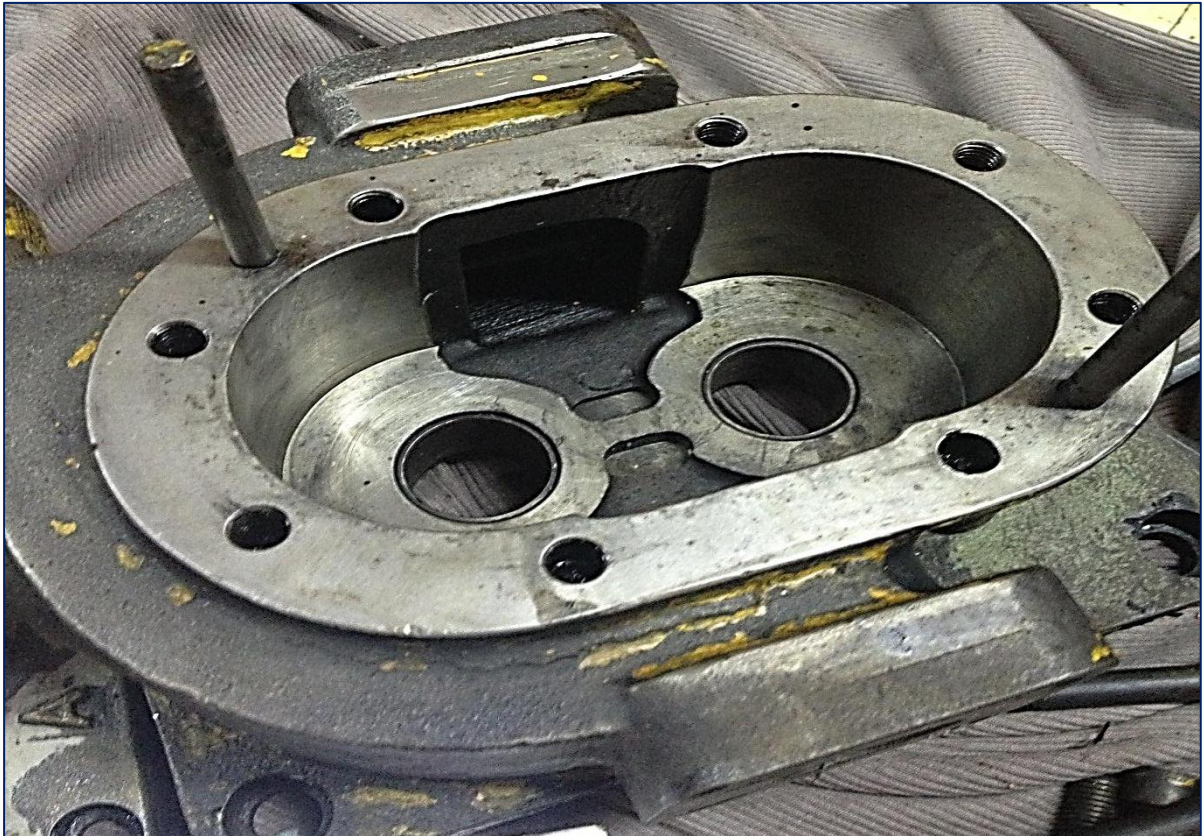
G/E NO:1,2,3,4 COUPLED LUB.OIL PUMP;

G/E NO:4 COUPLED FRESH WATER PUMP;

All attached lub.oil pumps of Generator Engine No:1,2,3,4 has dismantled & transferred to the workshop. Disassembled for inspection & reconditioned. Some of the gear type lub.oil pump's gears cleaned, polished & fitted. Also roller bearing has renewed & fitted with engine bearing. After recondition all attached lub.oil pumps assembled & transferred to the vessel and mounted on stu immediately.

Attach fresh water pump of Generator Engine No:4 has dismantled & transferred to the workshop. Disassembled for inspection & recondition. This pump was centrifugal type so all roller bearings has renew.After the fitting of shaft,impeller assembled immediately & transferred to the vessel for mounting on stu.







INDEPENDENT PUMPS;

M/E SEA WATER PUMP NO:1 & NO:2 OVERHAUL;

Main Engine Sea Water Pumps has dismantled from foundation. Transferred to the workshop & opened for inspection. According to our inspection, we started to overhaul. Shaft has machined due to corroded surfaces. Backlash has removed. Packing gland bush, wire ring, middle bearing bush, sleeve shaft, fabricated & assembled. Ball bearings has changed by new ones. Case, electrical motor foundation and foundation flange fabricated on the optic laser machine, packing change, case electrical motor foundation seating surface machining for centering the electrical motor, later by centered, meanwhile electrical motor overhaul started already. Electrical motor tested with meger. Ball bearings changed with new ones. Rotor & stator chemically cleaned & heated for drying. Vernished by 2 coats. Ball bearing housing measurements taken for ball bearing clearance, noticed. Case painted, damaged ventilation case repaired. Transferred to the vessel , mounted on stu.







AUXILIARY ENGINE SEA WATER PUMP NO:1 & NO:2 OVERHAUL;

Auxiliary Engine Sea Water Pumps has dismantled from foundation. Transferred to the workshop & opened for inspection. According to our inspection, we started to overhaul. Pump case wear ring seating area rewelded & machined due to deformation. Pump wear ring fabricated. Packing gland sleeve fabricated with bronze material & assembled. Ball bearings has changed by new ones. Foundation welded as per original due to heavily corroded. Case, electrical motor foundation and foundation flange fabricated on the optic laser machine, packing change, case electrical motor foundation seating surface machining for centering the electrical motor, later by bored for alignment & fitted with electrical motor bottom bearing, meanwhile electrical motor overhaul started already. Electrical motor tested with meger. Ball bearings changed with new ones. Rotor & stator chemically cleaned & heated for drying. Vernished by 2 coats. Ball bearing housing measurements taken for ball bearing clearance, noticed. Case painted, damaged ventilation case repaired. Transferred to the vessel , mounted on stu.





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SHIP REPAIR CONVERTING DRY DOCKING HYDRAULIC
PNEUMATIC MECHANIC ELECTRIC SPARE PART (NEW & USED)







BALLAST PUMP OVERHAUL;

Ballast Pump has dismounted from foundation. Transferred to the workshop & opened for inspection. According to our inspection, we started to overhaul. Shaft has machined due to corroded surfaces. Backlash has removed. Packing gland bush, wire ring, middle bearing bush, sleeve shaft, fabricated & assembled. Ball bearings has changed by new ones. Case, electrical motor foundation and foundation flange fabricated on the optic laser machine, packing change, case electrical motor foundation seating surface machining for centering the electrical motor, later by centered, meanwhile electrical motor overhaul started already. Electrical motor tested with meger. Ball bearings changed with new ones. Rotor & stator chemically cleaned & heated for drying. Vernished by 2 coats. Ball bearing housing measurements taken for ball bearing clearance, noticed. Case painted, damaged ventilation case repaired. Transferred to the vessel , mounted on stu.







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SHIP REPAIR CONVERTING DRY DOCKING HYDRAULIC
PNEUMATIC MECHANIC ELECTRIC SPARE PART (NEW & USED)





SANITARY PUMP OVERHAUL;

Sanitary Pump has dismounted from foundation. Transferred to the workshop & opened for inspection. According to our inspection, we started to overhaul. But cause of the material condition, it was not possible. All surface of the pump was broken or corroded. In the lights of this inspection, sanitary pump completely destroyed & seperated as scrap.



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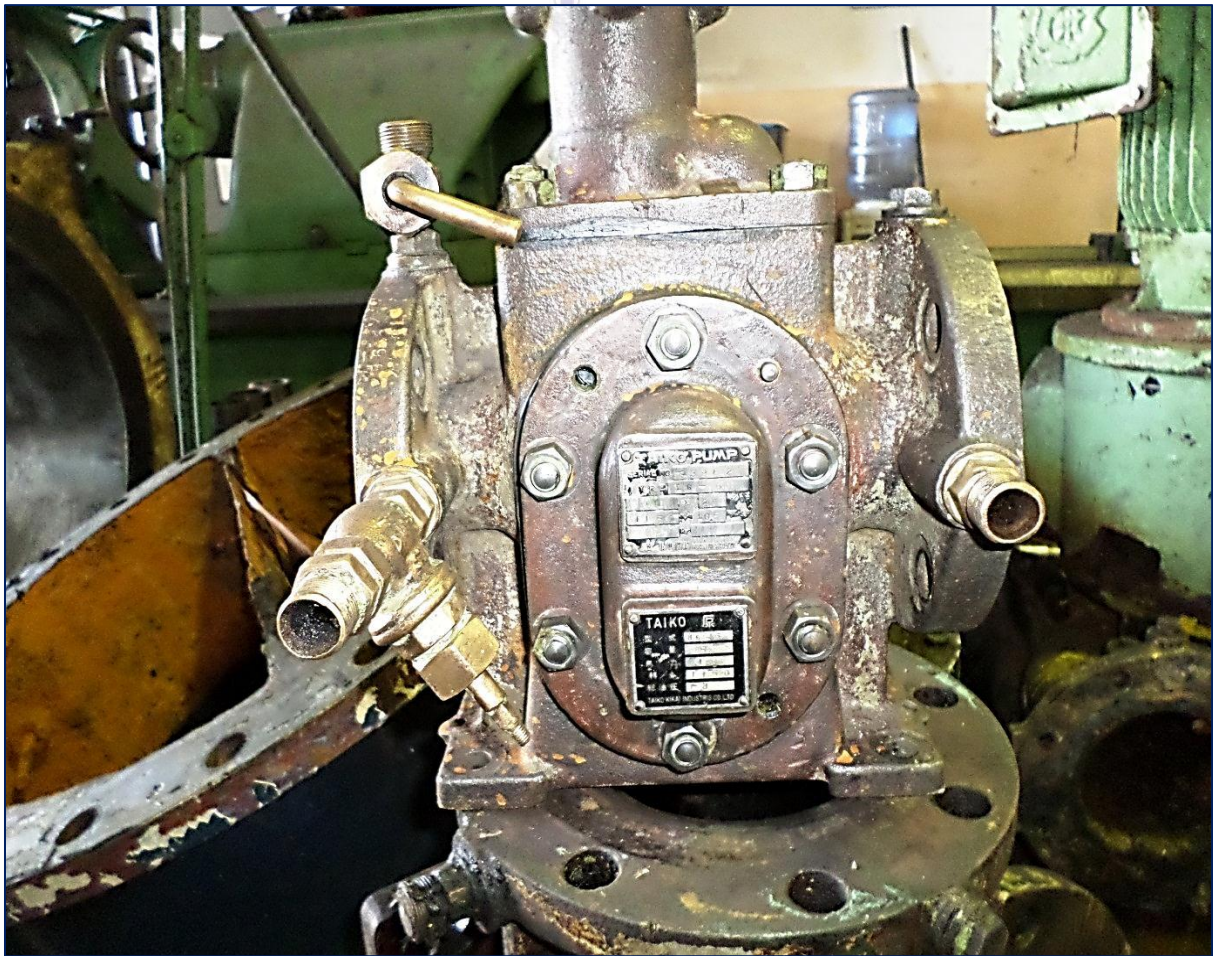
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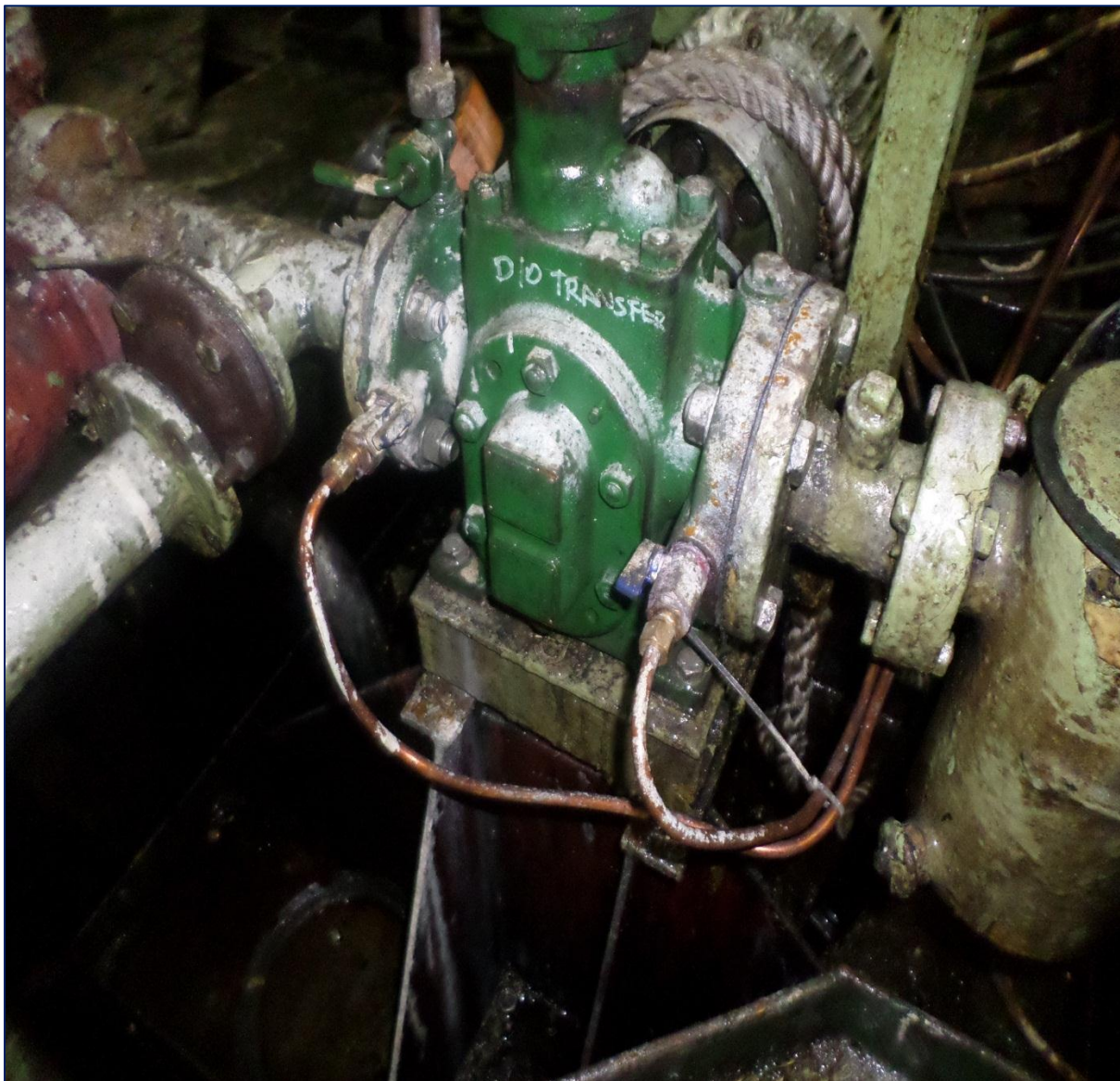
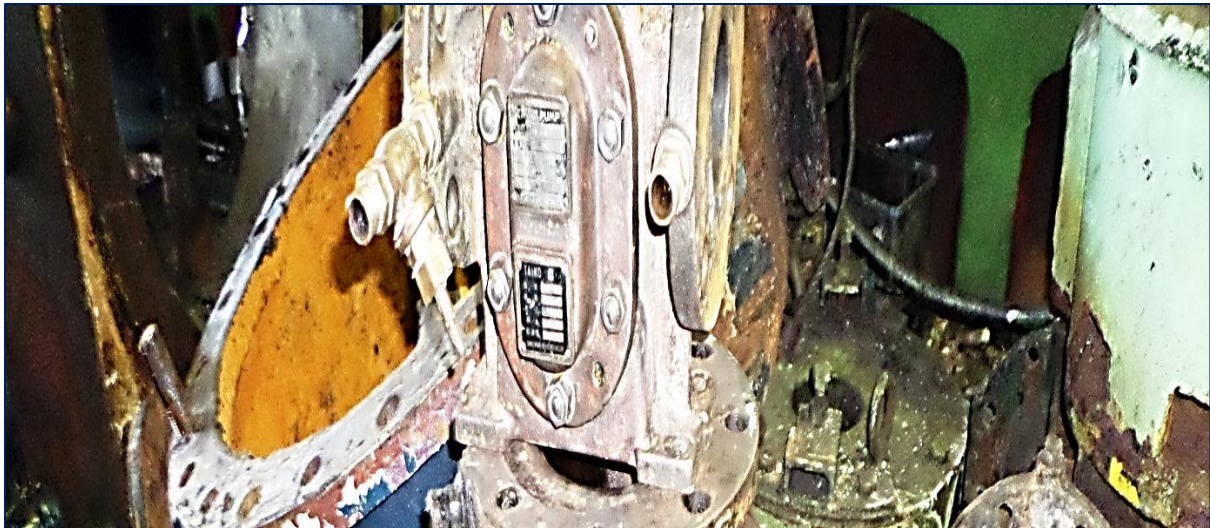


DIESEL OIL TRANSFER PUMP OVERHAUL;

Diesel Oil Transfer Pump has dismantled from foundation. Transferred to the workshop & opened for inspection. According to our inspection, we started to overhaul. Gear & Liner clearance checked. Shaft bending checked, gears crack test made. Bearing bush clearance checked & bearing surface cleaned. Cover case surface machining due to corroded surface. Case connection bolts & nuts changed. Case gasket changed. Case chipping & painting also mechanical seal changed by the new one.

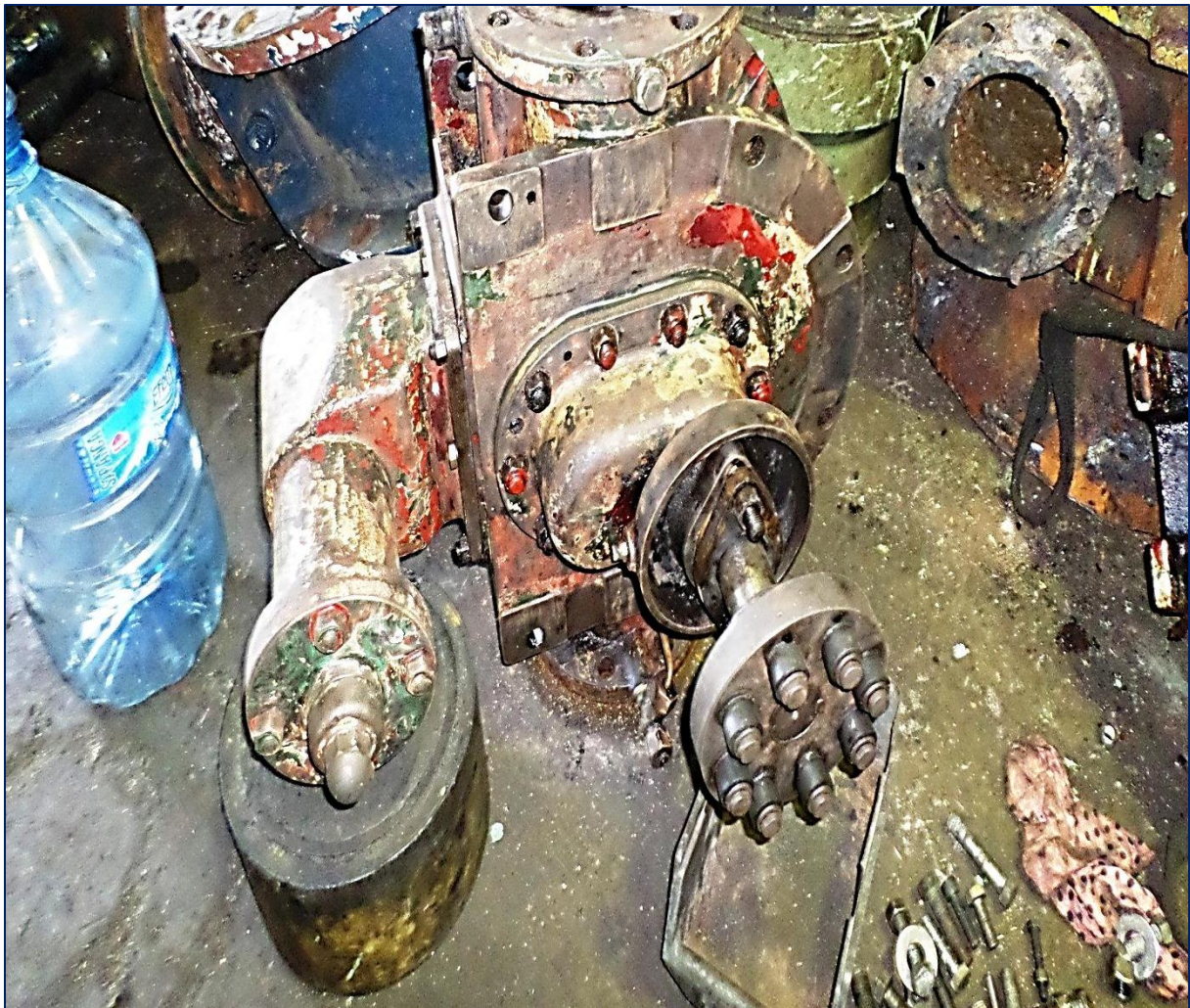
Electrical motor tested with meger. Ball bearings changed with new ones. Rotor & stator chemically cleaned & heated for drying. Vernished by 2 coats. Ball bearing housing measurements taken for ball bearing clearance, noticed. Case painted, damaged ventilation case repaired. Transferred to the vessel , mounted on stu.





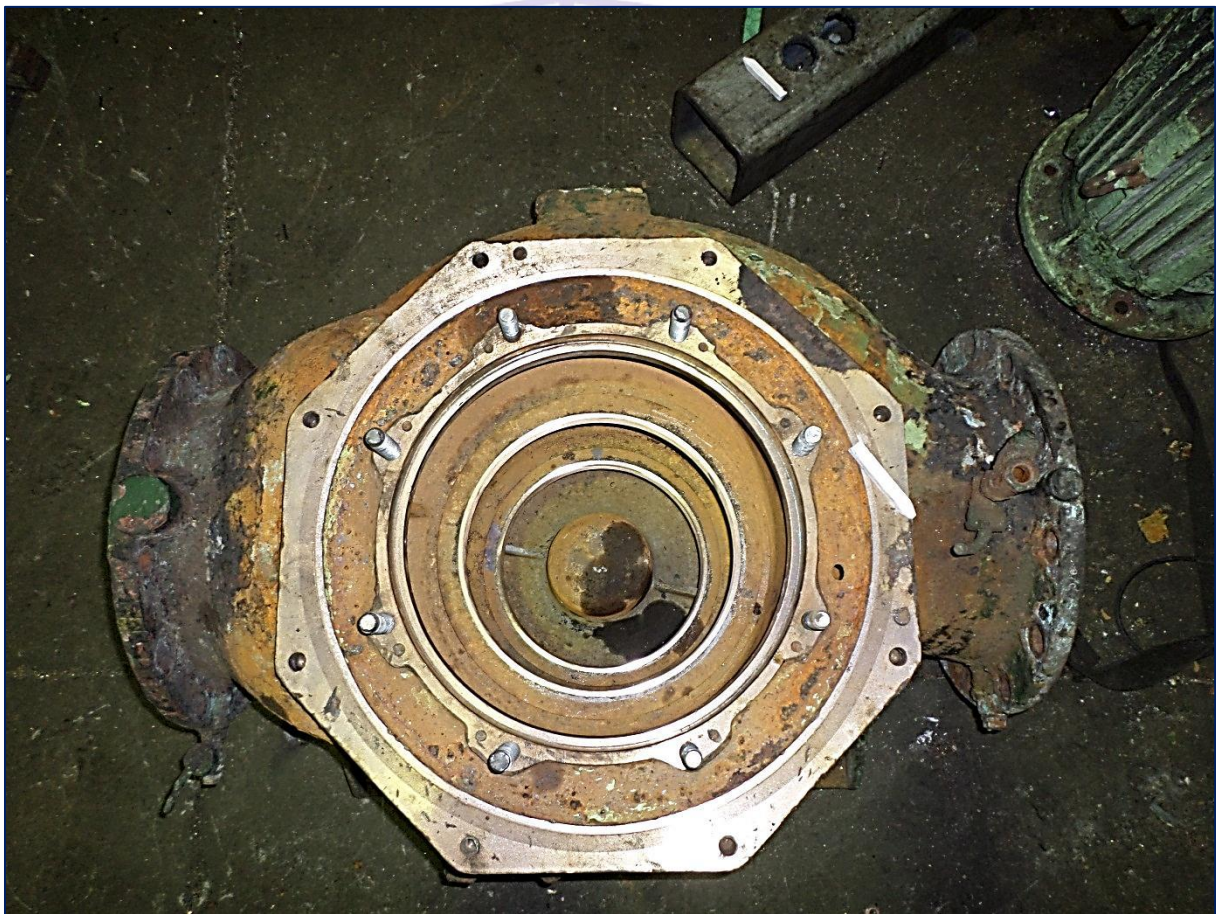
FUEL OIL TRANSFER PUMP OVERHAUL;

Fuel Oil Transfer Pump has dismantled from foundation. Transferred to the workshop & opened for inspection. According to our inspection, we started to overhaul. Gear & Liner clearance checked. Shaft bending checked, gears crack test made. Bearing bush clearance checked & bearing surface cleaned. Cover case surface machining due to corroded surface. Case connection bolts & nuts changed. Case gasket changed. Case chipping & painting also mechanical seal changed by the new one. Electrical motor tested with meger. Ball bearings changed with new ones. Rotor & stator chemically cleaned & heated for drying. Vernished by 2 coats. Ball bearing housing measurements taken for ball bearing clearance, noticed. Case painted, damaged ventilation case repaired. Transferred to the vessel , mounted on stu.



GENERAL SERVICE PUMP OVERHAUL;

General Service Pump has dismantled from foundation. Transferred to the workshop & opened for inspection. According to our inspection, we started to overhaul. Shaft has machined due to corroded surfaces. Backlash has removed. Packing gland bush, wire ring, middle bearing bush, sleeve shaft, fabricated & assembled. Ball bearings has changed by new ones. Case, electrical motor foundation and foundation flange fabricated on the optic laser machine, packing change, case electrical motor foundation seating surface machining for centering the electrical motor, later by centered, meanwhile electrical motor overhaul started already. Electrical motor tested with meger. Ball bearings changed with new ones. Rotor & stator chemically cleaned & heated for drying. Vernished by 2 coats. Ball bearing housing measurements taken for ball bearing clearance, noticed. Case painted, damaged ventilation case repaired. Transferred to the vessel , mounted on stu.

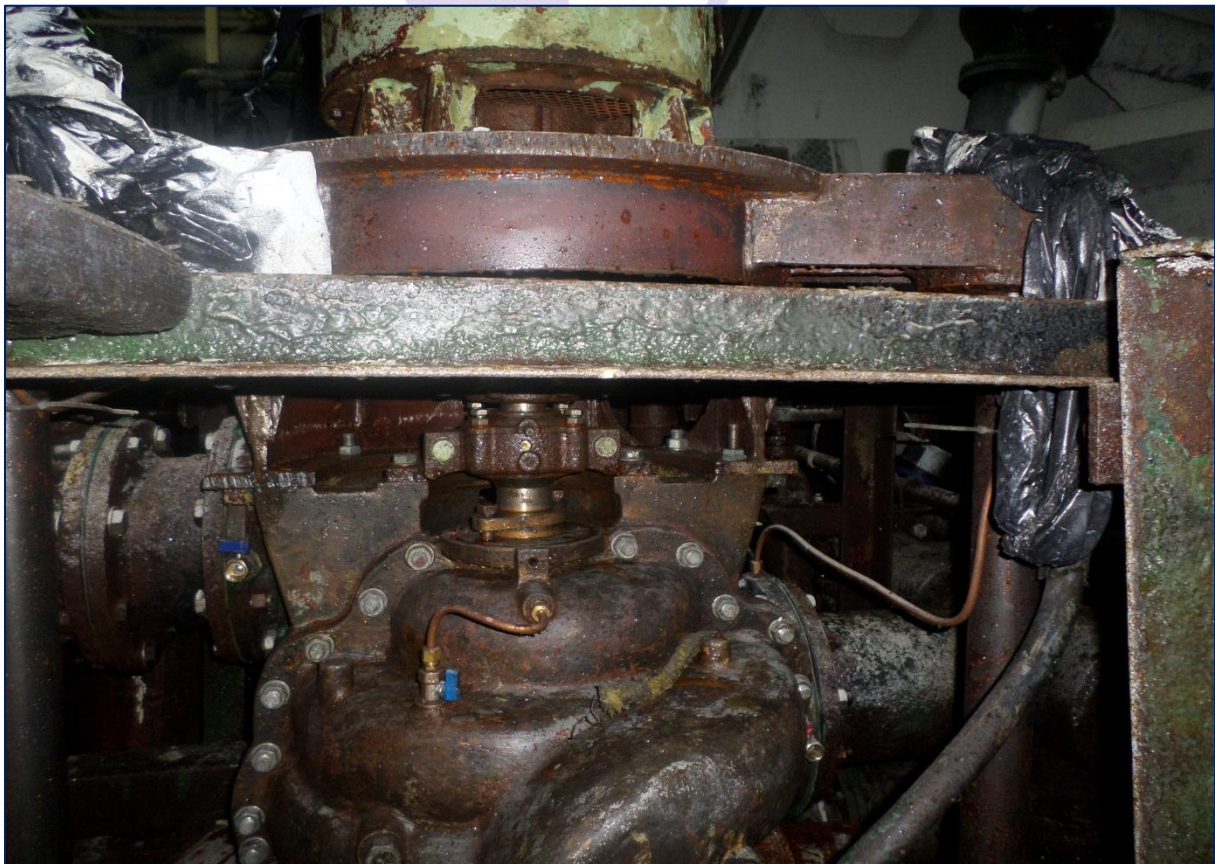






FIRE & BILGE PUMP OVERHAUL;

Fire & Bilge pump has dismounted from foundation. Transferred to the workshop & opened for inspection. According to our inspection, we started to overhaul. Pump case wear ring seating area rewelded & machined due to deformation. Pump wear ring fabricated. Packing gland sleeve fabricated with bronze material & assembled. Ball bearings has changed by new ones. Foundation welded as per original due to heavily corroded. Case, electrical motor foundation and foundation flange fabricated on the optic laser machine, packing change, case electrical motor foundation seating surface machining for centering the electrical motor, later by bored for alignment & fitted with electrical motor bottom bearing, meanwhile electrical motor overhaul started already. Electrical motor tested with meger. Ball bearings changed with new ones. Rotor & stator chemically cleaned & heated for drying. Vernished by 2 coats. Ball bearing housing measurements taken for ball bearing clearance, noticed. Case painted, damaged ventilation case repaired. Transferred to the vessel , mounted on stu.



SCRUBBER PUMP OVERHAUL;

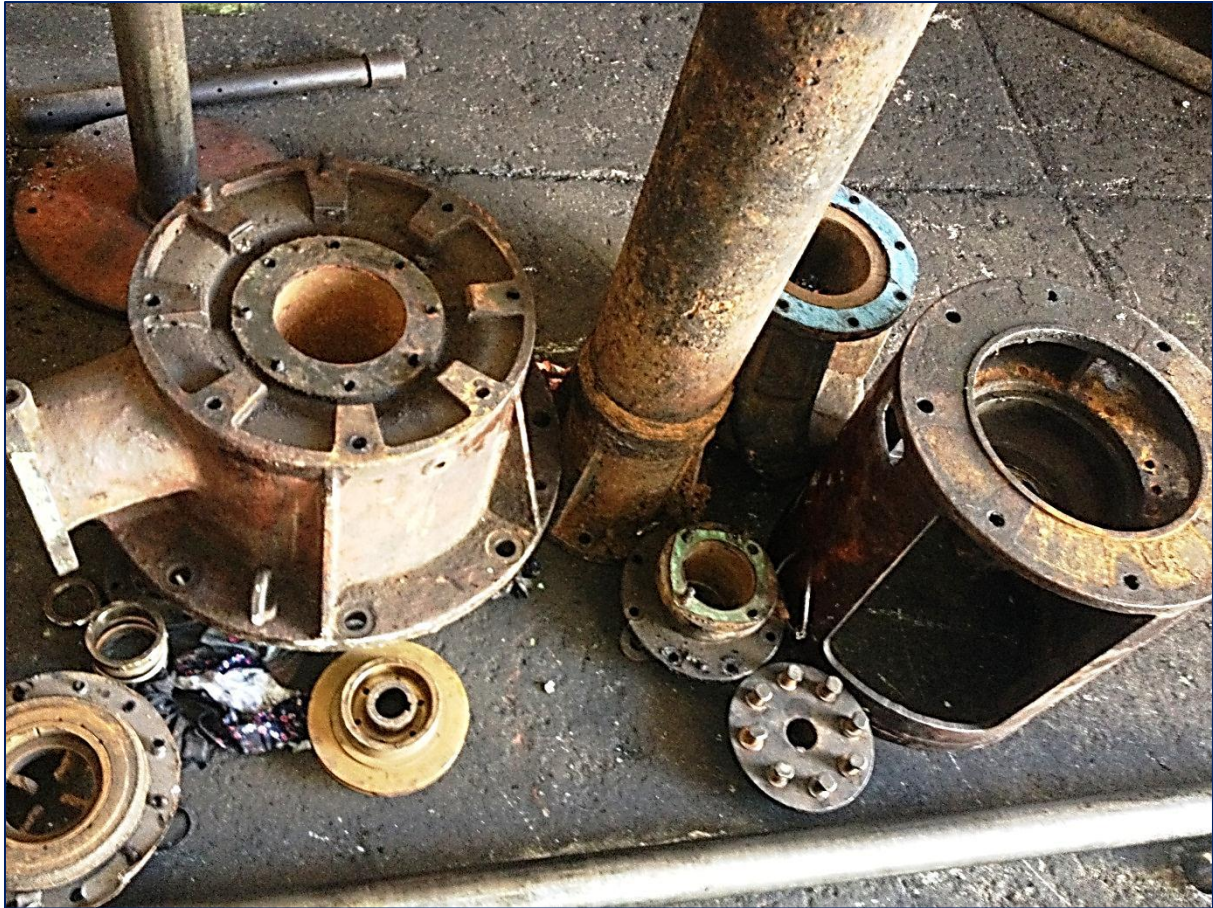
Scrubber pump has dismounted from foundation. Transferred to the workshop & opened for inspection. According to our inspection, we started to overhaul. Shaft fabricated with the chrome material. Wire ring fabricated & changed. Also ball bearing changed with the new one. Case, electrical motor foundation and foundation flange fabricated on the optic laser machine, packing change, case electrical motor foundation seating surface machining for centering the electrical motor, later by bored for alignment & fitted with electrical motor bottom bearing, meanwhile electrical motor overhaul started already. Electrical motor tested with meger. Ball bearings changed with new ones. Rotor & stator chemically cleaned & heated for drying. Vernished by 2 coats. Ball bearing housing measurements taken for ball bearing clearance, noticed. Case painted, damaged ventilation case repaired. Transferred to the vessel , mounted on stu.



PISTON COOLING PUMP NO:1 OVERHAUL;

Piston cooling fresh water pump has dismantled from foundation. Transferred to the workshop & opened for inspection. According to our inspection, we started to overhaul. Bended piston cooling pump new shaft fabricated. Wire ring fabricated with bronze material & changed. Pump lower case has reconditioned. Mechanical seal changed with the new one. Pump shaft protection case fabricated with flange, wire ring seat place welded. Electrical motor foundation and foundation flange fabricated on the optic laser machine, packing change, case electrical motor foundation seating surface machining for centering the electrical motor, later by bored for alignment & fitted with electrical motor bottom bearing, meanwhile electrical motor overhaul started already. Electrical motor tested with meger. Ball bearings changed with new ones. Rotor & stator chemically cleaned & heated for drying. Vernished by 2 coats. Case painted, damaged ventilation case repaired. Transferred to the vessel , mounted on stu.





PISTON COOLING FRESH WATER PUMP NO:2 OVERHAUL;

Piston cooling fresh water pump has dismounted from foundation. Transferred to the workshop & opened for inspection. According to our inspection, need to replace with the new pump.



TEKNOMARIN
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SHIP REPAIR CONVERTING DRY DOCKING HYDRAULIC
PNEUMATIC MECHANIC ELECTRIC SPARE PART (NEW & USED)

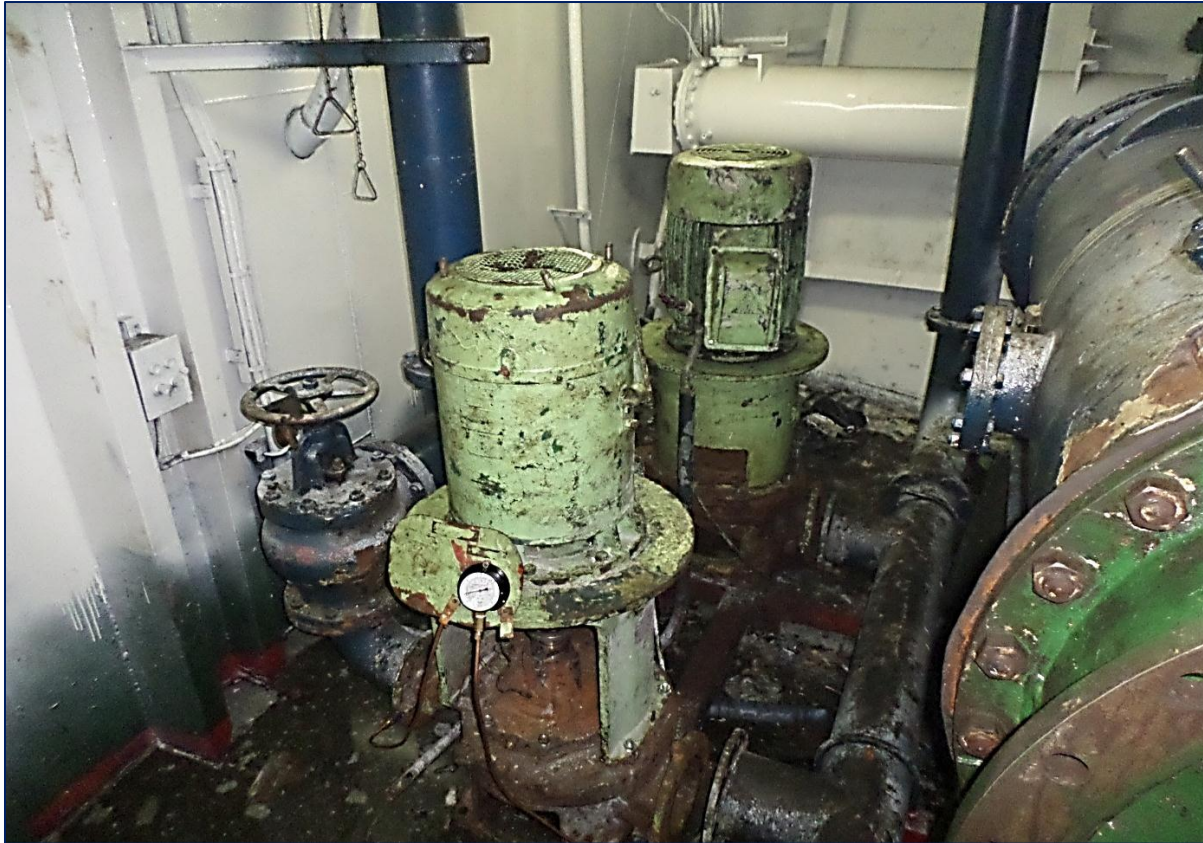




JACKET COOLING FRESH WATER PUMP NO:1 & NO:2 OVERHAUL;

Jacket Cooling Fresh Water Pumps has dismounted from foundation. Transferred to the workshop & opened for inspection. According to our inspection, we started to overhaul. Shaft has machined due to corroded surfaces. Backlash has removed. Packing gland bush, wire ring, middle bearing bush, sleeve shaft, fabricated & assembled. Ball bearings has changed by new ones. Case, electrical motor foundation and foundation flange fabricated on the optic laser machine, packing change, case electrical motor foundation seating surface machining for centering the electrical motor, later by centered, meanwhile electrical motor overhaul started already. Electrical motor tested with meger. Ball bearings changed with new ones. Rotor & stator chemically cleaned & heated for drying. Vernished by 2 coats. Ball bearing housing measurements taken for ball bearing clearance, noticed. Case painted, damaged ventilation case repaired. Transferred to the vessel , mounted on stu.





AIR CONDITION SEA WATER PUMP OVERHAUL;

Air Condition Sea Water Pump has dismounted from foundation. Transferred to the workshop & opened for inspection. According to our inspection, we started to overhaul. Pump case wear ring seating area rewelded & machined due to deformation. Pump wear ring fabricated. Packing gland sleeve fabricated with bronze material & assembled. Ball bearings has changed by new ones. Foundation welded as per original due to heavily corroded. Case, electrical motor foundation and foundation flange fabricated on the optic laser machine, packing change, case electrical motor foundation seating surface machining for centering the electrical motor, later by bored for alignment & fitted with electrical motor bottom bearing, meanwhile electrical motor overhaul started already. Electrical motor tested with meger. Ball bearings changed with new ones. Rotor & stator chemically cleaned & heated for drying. Vernished by 2 coats. Ball bearing housing measurements taken for ball bearing clearance, noticed. Case painted, damaged ventilation case repaired. Transferred to the vessel , mounted on stu.



BOILER FEED WATER PUMP NO:1 & NO:2 OVERHAUL;

Both boiler feed water pumps has dismantled from foundation. Transferred to the workshop & opened for inspection. According to our inspection, need to replace with the new pumps. Pipes & foundation fitted.



HYDROPHORE PUMP NO:1 OVERHAUL;

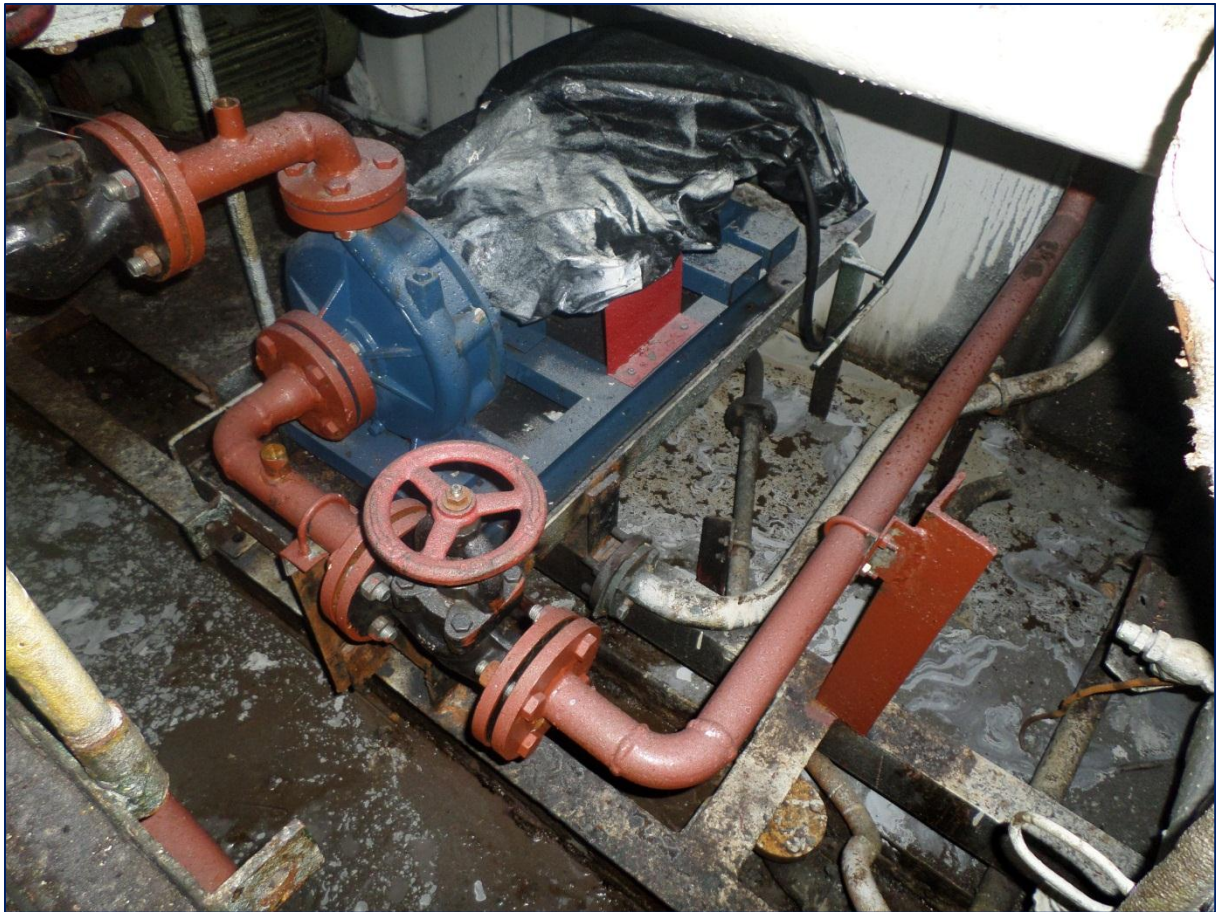
Hydrophore pump has dismantled from foundation. Transferred to the workshop & opened for inspection. According to our inspection, need to replace with the new pump. Pipes & foundation fitted.



HYDROPHORE PUMP NO:2 ELC.MOTOR OVERHAUL;

Hydrophore Pump No:2 Electrical motor tested with meger. Ball bearings changed with new ones. Rotor & stator chemically cleaned & heated for drying. Vernished by 2 coats. Ball bearing housing measurements taken for ball bearing clearance, noticed. Case painted, damaged ventilation case repaired. Transferred to the vessel , mounted on stu.





FUEL OIL BURNING PUMP NO:1 & NO:2 OVERHAUL;

Fuel Oil Burning Pumps has dismantled from foundation. Transferred to the workshop & opened for inspection. According to our inspection, pump case liner honned for surface bending, ball bearings changed, gear clearance controlled, mechanical seal changed by the new one, oil seal changed, case's bolts, nuts & gaskets changed. Later by the recondition, pumps transferred to the vessel, mounted on stu.



EVAPORATOR SEA WATER PUMP NO:1 & NO:2 OVERHAUL;

Evaporator Sea Water Pump has dismantled from foundation. Transferred to the workshop & opened for inspection. According to our inspection, we started to overhaul. Pump case wear ring seating area rewelded & machined due to deformation. Pump wear ring fabricated. Packing gland sleeve fabricated with bronze material & assembled. Ball bearings has changed by new ones. Later by the recondition, pumps transferred to the vessel, mounted on stu.

GENERATOR ENGINE NO:5 SEA WATER PUMP NO:1 & NO:2 OVERHAUL;

Generator Engine Sea Water pumps has dismantled from foundation. Transferred to the workshop & opened for inspection. According to our inspection, need to replace with the new pump. Pipes & foundation fitted.



EXTRAS

List of the extras that fabricated, made, tested, installed or reconditioned by TEKNOMARIN;

- *Load Test of Engine Room Crane
- *Oil Mist Detector Overhaul
- *Steering Gear Pump Seal Changing
- *Deck Wash Motor Recondition
- *Forward Starboard Anchor Windlass Steam Engine Recondition
- *Forward Port Anchor Windlass Steam Engine Recondition
- *Aft Starboard Capstain Steam Engine Recondition
- *Aft Center Capstain Steam Engine Recondition
- *Windlass & Capstain Steam Engine Hydromotors Foundation Repair
- *Boiler Exhaust Isolation
- *Steam Tank Isolation
- *Emergency Fire Pump Engine Overhaul
- *Galley Heater Griddle Recondition
- *Engine Room Lighting Improvements
- *Suction & Discharge Gauges for All Reconditioned & Remained Pumps in Engine Room
- *Accomodation Hot Water Heater Revising
- *Steam Generator Installing
- *Windlass & Capstain Hydraulic System
- *Forward Windlass Gypsy Recondition
- *Generator No:5 Expansion Tank Fabricating



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SHIP REPAIR CONVERTING DRY DOCKING HYDRAULIC
PNEUMATIC MECHANIC ELECTRIC SPARE PART (NEW & USED)



LOAD TEST OF ENGINE ROOM CRANE;

We chose appropriate loads for the test based on the manufacturer's load ratings for the condition of use. A 25% minimum partial load, the rated load, and a proof load as close as possible but not exceeding 125% of rated load shall be used. We checked manufacturer's limitations and or specific instructions on testing. The crane operated without a load through its full range of operation and all safety devices and limit switches checked. The 25% partial load be applied and required adjustments made for appropriate function. Lift the rated load a sufficient height to ensure that each tooth of the lifting gear train has subjected to the rated load. We lowered the load to a height of 4-8 inches above the ground. After the tests are completed, conduct a thorough examination to ensure that the crane has satisfactorily withstood the tests. We parked the crane at the proper location for service access and relax all rigging and reeving to allow for inspection of the wire rope and reeving components. Opened the main disconnect and install a safety lock—out device before mounting the crane.

*Engine Room Crane / Tested / **Operative.***



OIL MIST DETECTOR OVERHAUL;

Oil Mist Detector has dismantled & transferred to the workshop. OMD has disassembled & cleaned firstly. Some of the cable connections were heavily damaged & need to renew. Also main socket was stuck with dust. After the synchronizing the detector, tested with paper on mirror side. OMD activated for all cylinders and setted operative for all. After the recondition, transferred to the vessel & mounted on stu. *Oil Mist Detector / Tested / **Operative**.*



DECK WASH ELECTRICAL MOTOR RECONDITION;

Deck Wash Electrical Motor has dismantled & transferred to the workshop. Due to inspection, electrical motor completely burnt out and need to be rewinding. Also ventilation cover has damaged. In the lights of above, electrical motor completely rewinded, double vernish coated and ventilation cover has reconditioned. Later by transferred to the vessel & delivered.



PORT & STARBOARD & CENTER / WINDLASS & CAPSTAIN STEAM ENGINE RECONDITION;

Port, Starboard & Center / Windlass & Capstain Steam Engines has dismantled & transferred to the workshop. Due to inspection, chromaged shaft renewed, liners honned & pistons fabricated due to sizes of honned liners. Piston rings also fabricated & replaced. Sphero slide fabricated & fitted. Keys, nuts, bolts & gasket fabricated & renewed. Also packing gland fabricated & installed. Later



M/V ALMAWASHI OVERHAUL REPORT

by scrapped, rubbered & painted. Assembled & transferred to the vessel, mounted on stu & made ready for test.



M/V ALMAWASHI OVERHAUL REPORT



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PNEUMATIC MECHANIC ELECTRIC SPARE PART (NEW & USED)



BOILER EXHAUST ISOLATION;

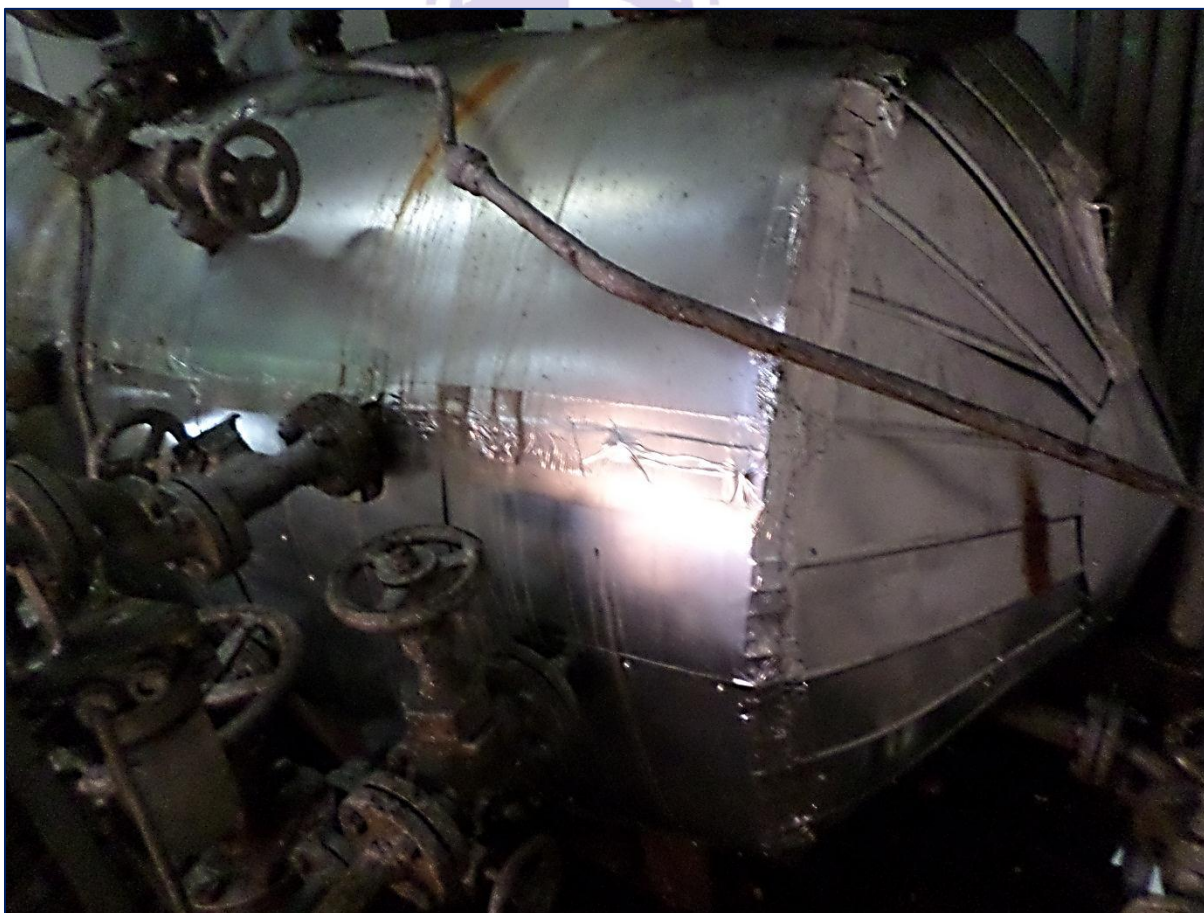
Due to our inspection, Boiler exhaust's isolation has corroded & damaged. Regarding to our taken measures, isolation plates has renewed & replaced.



STEAM TANK ISOLATION;

Due to our inspection, steam tank isolation has corroded & damaged.
Regarding to our taken measures, isolation plates has renewed & replaced.





EMERGENCY FIRE PUMP ENGINE OVERHAUL;

All connections of cylinder heads dismantled. All cylinder heads dismantled & transferred to the workshop. All piston bolts dismantled. All pistons disassembled & transferred to the workshop. All liners disassembled & transferred to the workshop. Block checked for possibly cracks. After inspection and measurements, liners mounted, pistons assembled. Cylinder heads assembled & valves timed. According to this maintenance we started the emergency fire pump engine with the pump, pressure checked, engine checked. All is well, **Operative.**



GALLEY HEATER RECONDITION;

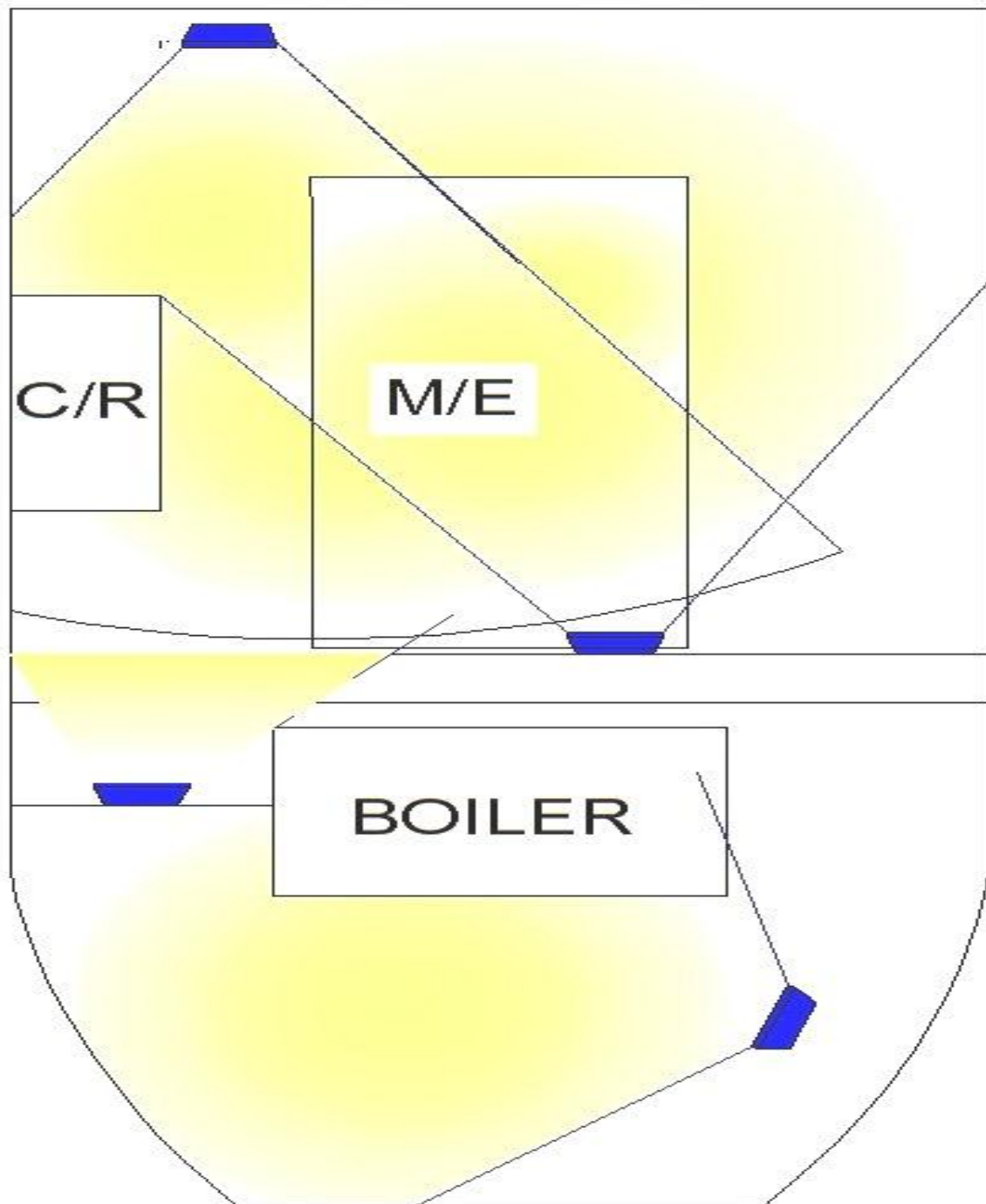
Two units of galley heater has dismantled cause of the heating problem. As we inspected, these items must be recondition. Some of the resistances has dismantled as sample & renewed, replaced. Meanwhile cover also controlled. Later by transferred to the vessel & delivered.



ENGINE ROOM LIGHTING IMPROVEMENTS;

4 units of projectors installed to the engine room for improving the lighting.

FORWARD



AFT



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VACUUM & PRESSURE GAUGES FOR RECONDITIONED PUMPS;

Vacuum & Pressure Gauges has installed to all pumps as below;

- *M/E Sea Water Pump No:1 – Vacuum & Pressure
- *M/E Sea Water Pump No:2 – Vacuum & Pressure
- *Auxiliary Engine Sea Water Pump No:1 – Vacuum & Pressure
- *Auxiliary Engine Sea Water Pump No:2 – Vacuum & Pressure
- *Ballast Pump – Vacuum & Pressure
- *D/O Transfer Pump – Vacuum & Pressure
- *F/O Transfer Pump – Vacuum & Pressure
- *Scrubber Pump – Vacuum & Pressure
- *Jacket Cooling Fresh Water Pump No:1 – Vacuum & Pressure
- *Jacket Cooling Fresh Water Pump No:2 – Vacuum & Pressure
- *AC Sea Water Pump – Vacuum & Pressure
- *Boiler Feed Water Pump No:1 – Pressure
- *Boiler Feed Water Pump No:2 – Vacuum & Pressure
- *F/O Burning Pump No:1 – Pressure
- *F/O Burning Pump No:2 – Vacuum & Pressure



HOT WATER HEATER FOR ACCOMODATION REVISING;

Regarding to our inspection, one of the hydrophore tanks, needs to be revised, equipped with the 5 pcs of 5 KW Heater with thermostat.



STEAM GENERATOR INSTALLED & FITTED;

According to the present steam boiler & system condition, new steam generator must be installed for system of heating fuel oil, steam for accomodation etc. In the lights of these informations, a new steam generator supplied to the vessel & fitted to the place that showed by ship staff.



M/V ALMAWASHI OVERHAUL REPORT

After the fitting & welding of foundation, steam generator was ready for the transfer to engine room & for setting up.







Meanwhile we fitted a diesel oil tank to high level of the steam generator blower for the gravity drop. Quick closing valve for the diesel oil line has mounted. And the controller has been putted to the chimney.





HYDRAULIC SYSTEM FOR WINDLASS & CAPSTAIN;

Regarding to our inspection, windlass & capstain winches must be replaced & renewed by hydraulic system. We cancelled all steam inlines & we made ready a new hydraulic system for windlass & capstain.

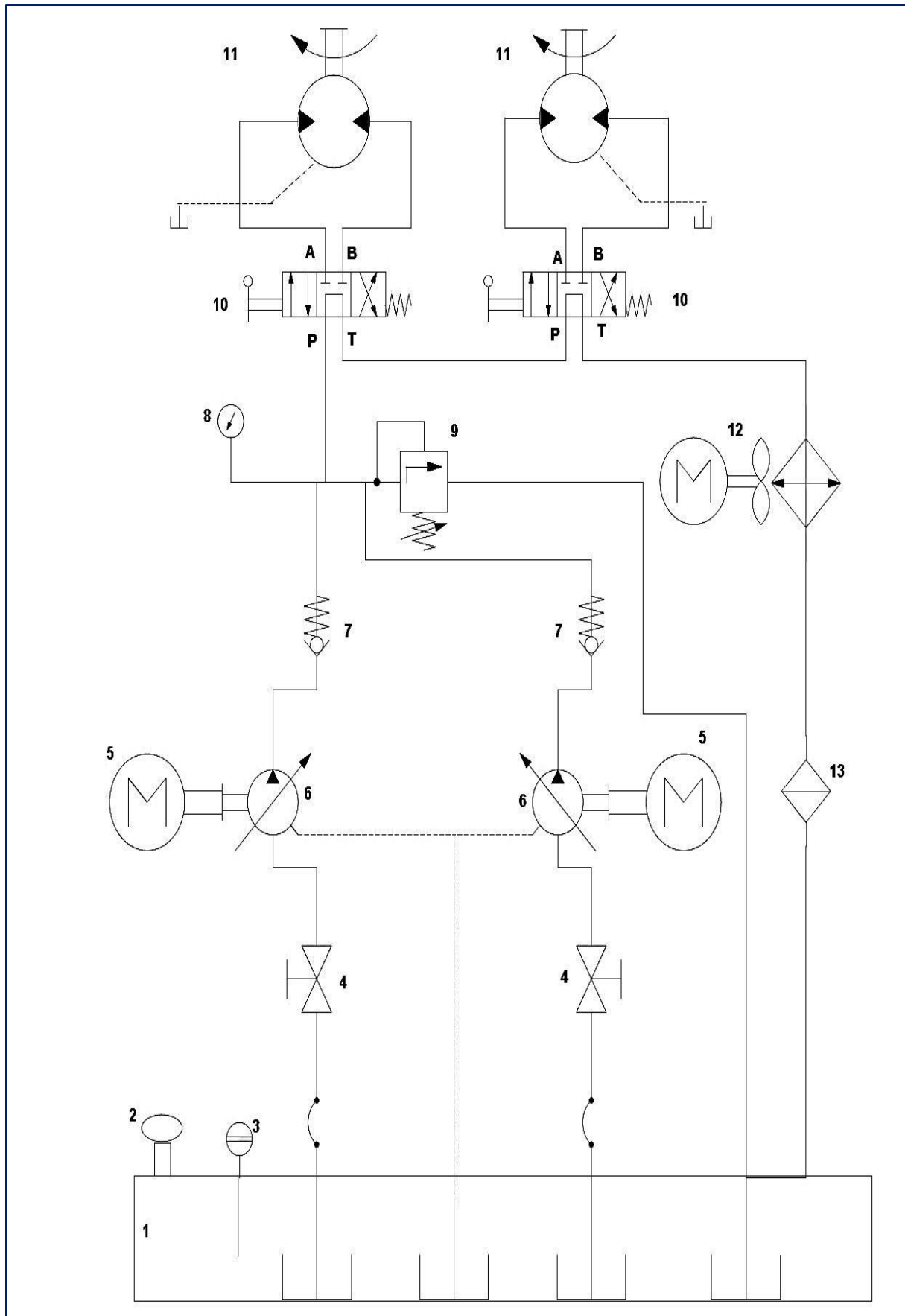
New hydraulic system for windlass' elements as below;

90x2 KW 160X2 CC POWER UNIT FOR WINDLASS

- *Oil tank
- *Oil filling cover
- *Level contactor (500mm)
- *Inlet Valve
- *90 KW 380V ABB Elc. Motor
- *A7V160 DR1RPFMO Piston Pump
- *1/4" 315 Check Valve
- *100x250 Bar manometer
- *DB 30 315 BAR Pressure secure valve
- *4-DWVG-25 G5*/F Armed way valve
- *MRH-3150 SWN-2 Radial Piston pump motor
- *4050 230V Cooler with fan
- *1/2" 25 MC Return filter





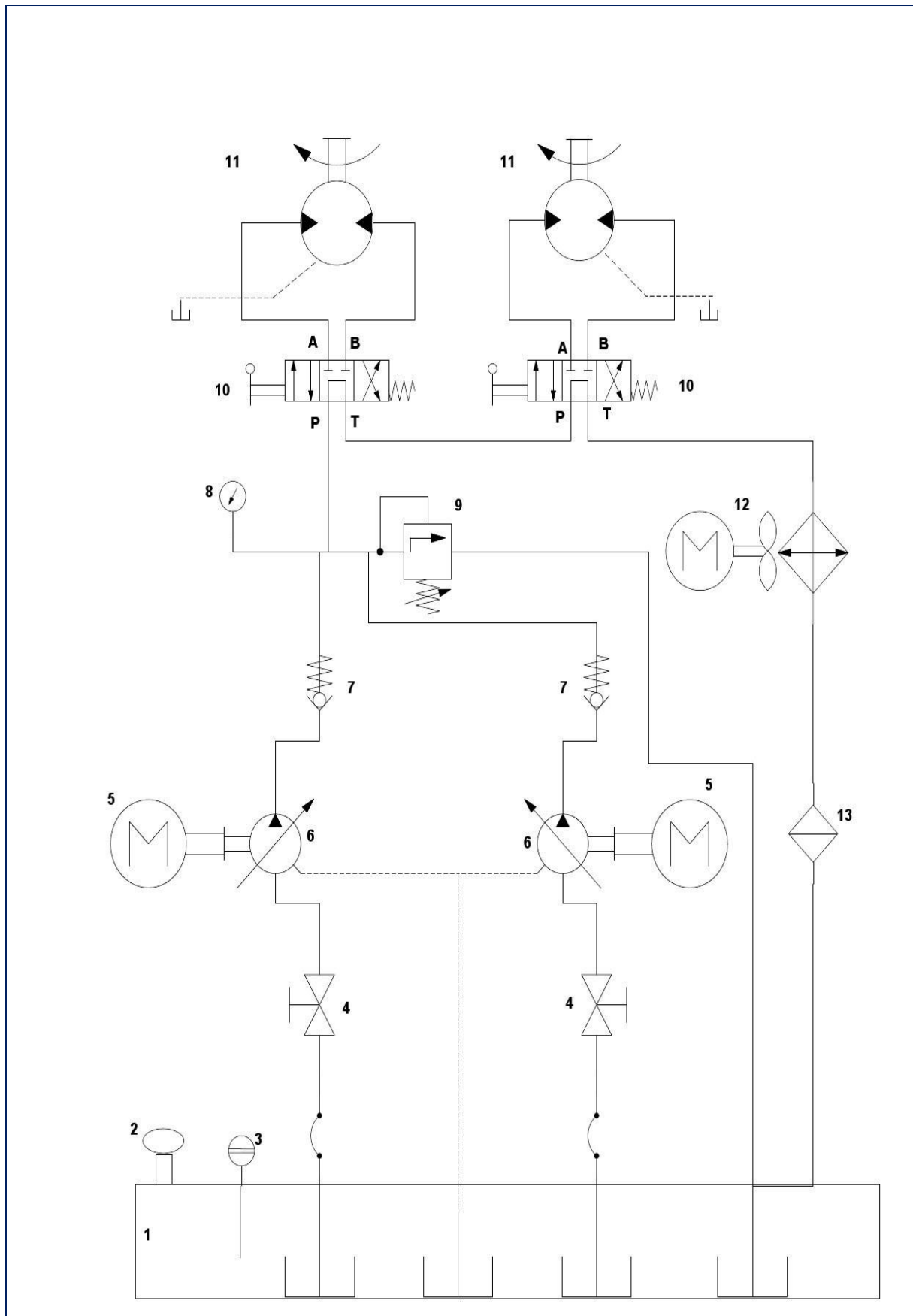


45x2 KW 160X2 CC POWER UNIT FOR CAPSTAIN



- *Oil tank
- *Oil filling cover
- *Level contactor (500mm)
- *Inlet Valve
- *45 KW 380V Gamak Elc. Motor
- *A2F80R293Piston Pump
- *1" Check Valve
- *100x250 Bar manometer
- *DB 30 315 BAR Pressure secure valve
- *4-DWMG-16 G5*/F Armed way valve
- *MRH-3150 SWNX-2 Radial Piston pump motor
- *4040M 230V Cooler with fan
- *1/2" 25 MC Return filter







MEASUREMENTS;**MAIN ENGINE SULZER RND 90**

 TEKNOMARIN SHIP REPAIR CONVERTING DRY DOCKING HYDRAULIC MARINE TECHNICAL INC. PNEUMATIC MECHANIC ELECTRIC SPARE PART (NEW & USED) 									
FUEL PUMP TIMING MEASUREMENT REPORT (mm)									
(FUEL PUMP TIMING ÖLÇÜ RAPORU)									
Vessel Name (Gemi Adı): ALMAWASHI					Engine Type & Serial (Makine Modeli & Seri No): SULZER 6RND90				
Date (Tarih): 21/02/2014									
Load Indicator Position (Rak Kolu Pozisyonu): 8					Plunger Diameter (Plunger Çapı): 58mm				
Firing Order (Ateşleme Sırası): 1-6-2-4-3-5									
MEASUREMENT POSITION		CYLINDER NO							
		1	2	3	4	5	6		
Suction Valve Closes at Plunger Stroke (mm) (Suction Valf Kapanma Plunger Strogu / S1)	Before Adjustment (Ayar Öncesi)	-	-	-	-	-	-		
	After Adjustment (Ayar Sonrası)	7,51	7,51	7,51	7,51	7,51	7,51		
Suction Valve Closes Before TDC (degree) (Suction Valf Kapanma Derecesi / D1)	Found (Bulunan Değer)	9,1	9,0	9,3	9,3	8,9	9,8		
	Original (Orişinal Değer)	9,5	9,5	9,6	9,6	9,2	10,3		
Spill Valve Opens at Plunger Stroke (mm) (Spill Valf Açılma Strogu / S2)	Before Adjustment (Ayar Öncesi)	-	-	-	-	-	-		
	After Adjustment (Ayar Sonrası)	36,14	36,14	36,14	36,14	36,14	36,14		
Spill Valve Opens After TDC (degree) (Spill Valf Açılma Derecesi / D2)	Found (Bulunan Değer)	14,2	14,3	13,9	14,2	14,6	13,6		
	Original (Orişinal Değer)	13,7	13,8	13,7	13,7	14,2	13,0		
Effective Stroke (mm) (Efektif Strok / S2-S1)	Before Adjustment (Ayar Öncesi)	-	-	-	-	-	-		
	After Adjustment (Ayar Sonrası)	28,63	28,63	28,63	28,63	28,63	28,63		
Injection Angle (degree) (Ateşleme Derecesi / D1+D2)	Found (Bulunan Değer)	23,30	23,30	23,20	23,50	23,50	23,40		
	Original (Orişinal Değer)	23,20	23,30	23,30	23,30	23,40	23,30		
Load index position "0" Spill Valve Lift When Suction Valve Closes. (Rak kolu "0"dayken Suction Valf Kapandığında Spill valf yükselme miktarı)	Found (Bulunan Değer)	2,75							
	Original (Orişinal Değer)	1,20							
REMARKS (NOTLAR) : TIMING ADJUSTED WHILE L/O PUMP RUNNING, CONTROL AIR OPEN IN AHEAD POSITION.									



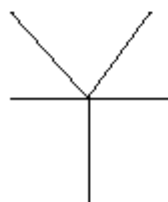
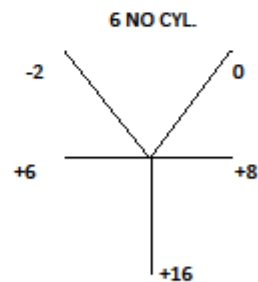
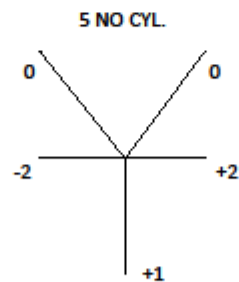
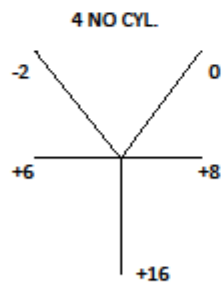
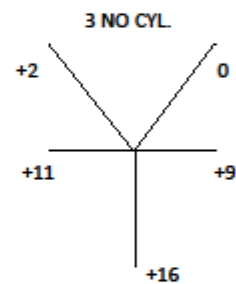
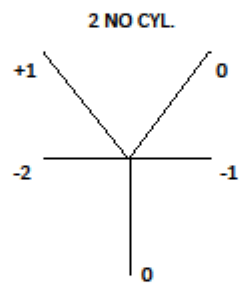
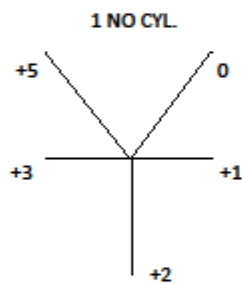


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• HİDROLİK • HYDRAULIC
• PNÖMATİK • PNEUMATIC
• MEKANİK • MECHANIC



Owner: HUAZI & GHOSHEH	Date: 14/03/2014
Article: MAIN ENGINE	
Inspect. Item: CRANK SHAFT DEFLECTION	
Ship's Name: M/V ALMAWASHI	
Eng. Type: SULZER RND 90	



TEKNOMARIN
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SHIP REPAIR CONVERTING DRY DOCKING HYDRAULIC
PNEUMATIC MECHANIC ELECTRIC SPARE PART (NEW & USED)



M/V ALMAWASHI OVERHAUL REPORT



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- HİDROLİK • HYDRAULIC
- PNÖMATİK • PNEUMATIC
- MEKANİK • MECHANIC



Owner: HIIAZI&GHOSHEH

Date: 14/03/2014

Article: MAIN ENGINE

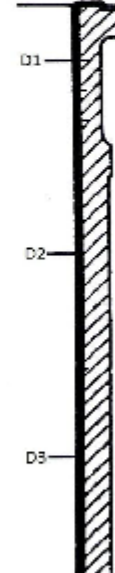
Inspect Item: LINER MEASUREMENT

Ship's Name: M/V ALMAWASHI

Eng. Type: SULZER RND 90

*LINER MEASUREMENT

Cyl.	Part Position	LINER		
		D1	D2	D3
1	Port/Stbd.	903,56	901,30	901,15
	Fwd./Aft.	904,70	902,45	902,10
2	Port/Stbd.	902,80	901,30	901,10
	Fwd./Aft.	903,10	901,56	901,25
3	Port/Stbd.	902,25	900,95	900,50
	Fwd./Aft.	903,25	901,15	900,70
4	Port/Stbd.	900,50	900,44	900,30
	Fwd./Aft.	900,65	900,50	900,40
5	Port/Stbd.	900,25	900,15	900,13
	Fwd./Aft.	900,40	900,20	900,15
6	Port/Stbd.	902,30	901,70	901,15
	Fwd./Aft.	902,65	901,50	901,15



Evllya Çelebi Mah. Rauf Orbay Cad. Eşref Bitlis Sk. No:2 Tuzla / İSTANBUL

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M/V ALMAWASHI OVERHAUL REPORT



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• PNÖMATİK • PNEUMATIC
• MEKANİK • MECHANIC



Owner: HUAZI&GHOSHEH

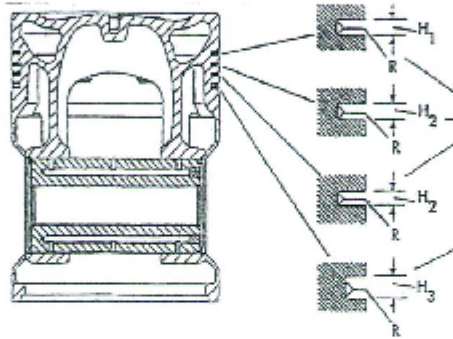
Date: 14/03/2014

Article: MAIN ENGINE

Inspect Item: PISTON RING GROOVE CLEARENCE

Ship's Name: M/V ALMAWASHI

Eng.Type: RND 90



*PISTON RING GROOVE CLEARENCE

NO	PISTON 1	PISTON 2	PISTON 3	PISTON 4	PISTON 5	PISTON 6
1	40	15	20	35	25	20
2	40	15	20	35	25	20
3	15	10	15	20	25	15
4	15	15	15	15	15	25
5	15	25	15	15	15	15

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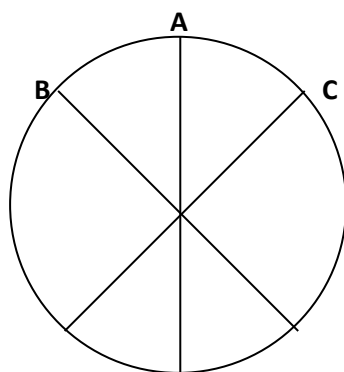
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SHIP REPAIR CONVERTING DRY DOCKING HYDRAULIC
PNEUMATIC MECHANIC ELECTRIC SPARE PART (NEW & USED)



GENERATOR ENGINE NO:1 HITACHI B&W 6323HH

MAIN JOURNAL WITHOUT BEARING;

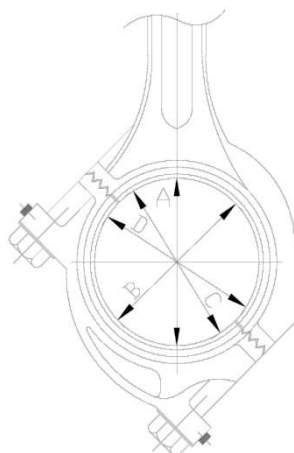


	A	A1	B	B1	C	C1
1	200,00	200,00	200,00	200,00	200,02	200,03
2	200,00	200,00	200,00	200,01	200,01	200,01
3	200,00	200,00	200,03	200,03	200,02	200,02
4	200,00	200,00	200,00	200,00	200,00	200,00
5	200,00	200,00	200,01	200,01	200,00	200,00
6	200,00	200,00	200,00	200,01	200,01	200,01
7	200,00	200,00	200,00	200,00	200,03	200,03



GENERATOR ENGINE NO:1 HITACHI B&W 6323HH

CON.ROD BUSHES



S.NO	A	B
1	98,20	98,20
2	98,18	98,15
3	98,18	98,16
4	98,14	98,08
5	98,22	98,18
6	98,17	98,14

S.NO	B	A	C
1	172,01	172,01	172,01
2	172,01	172,01	172,01
3	172,01	172,01	172,01
4	172,01	172,01	172,01
5	172,01	172,01	172,01
6	172,01	172,01	172,01

CON.ROD MEASURES BEFORE BORING



GENERATOR ENGINE NO:1 HITACHI B&W 6323HH

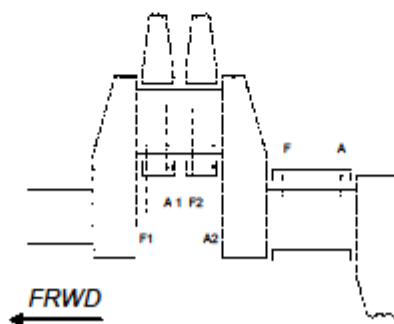


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SHIP REPAIR CONVERTING DRY DOCKING HYDRAULIC
PNEUMATIC MECHANIC ELECTRIC SPARE PART (NEW & USED)



MAIN AND CON. ROD BEARING CLEARANCES



CRANKSHAFT MAIN JOURNAL

S.NO	A1	A2	A3	B1	B2	B3
1	179,47	179,49	179,49	179,48	179,50	179,49
2	179,46	179,47	179,47	179,46	179,48	179,49
3	179,48	179,48	179,48	179,49	179,49	179,48
4	179,47	179,47	179,48	179,48	179,48	179,48
5	179,47	179,46	179,47	179,47	179,47	179,47
6	179,47	179,47	179,47	179,49	179,49	179,49
7	179,47	179,48	179,48	179,48	179,49	179,48

CRANKPIN

S.NO	A1	A2	A3	B1	B2	B3
1	164,48	164,48	164,48	164,48	164,48	164,48
2	164,45	164,46	164,46	164,46	164,46	164,46
3	164,46	164,46	164,47	164,47	164,47	164,47
4	164,47	164,47	164,47	164,48	164,47	164,47
5	164,43	164,43	164,44	164,43	164,43	164,44
6	164,47	164,47	164,47	164,46	164,46	164,46



TEKNOMARIN
MARINE TECHNICAL INC.

SHIP REPAIR CONVERTING DRY DOCKING HYDRAULIC
PNEUMATIC MECHANIC ELECTRIC SPARE PART (NEW & USED)





TEKNOMARIN
MARINE TECHNICAL INC.

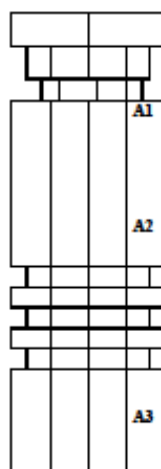
SHIP REPAIR/CONVERTING/DRYDOCKING/HYDRAULIC
PNEUMATIC/MECHANIC/ELECTRIC/SPARE PART (NEW&USED)



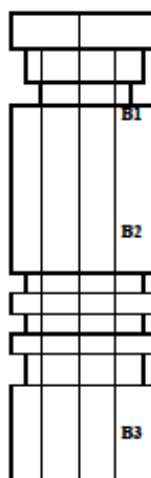
CYLINDER LINER DIMENSIONS

NO	A1	A2	A3	B1	B2	B3
1	225,18	225,10	225,15	225,20	225,10	225,25
2	225,15	225,10	225,25	225,18	225,10	225,25
3	225,25	225,10	225,25	225,18	225,10	225,30
4	225,15	225,10	225,30	225,15	225,10	225,30
5	225,28	225,18	225,15	225,28	225,18	225,15
6	225,05	225,00	225,00	225,00	225,00	225,00
SPARE	225,20	225,10	225,20	225,22	225,22	225,20
SPARE	225,55	220,50	225,50	225,50	225,50	225,50

FORE ↔ AFT



STBD ↔ PORT

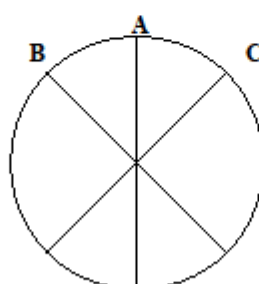


TEKNOMARIN
MARINE TECHNICAL INC.

SHIP REPAIR/CONVERTING/DRYDOCKING/HYDRAULIC
PNEUMATIC/MECHANIC/ELECTRIC/SPARE PART (NEW&USED)



GENERATOR ENGINE NO:2 HITACHI B&W 6323HH



MAIN JOURNAL WITHOUT BEARING:

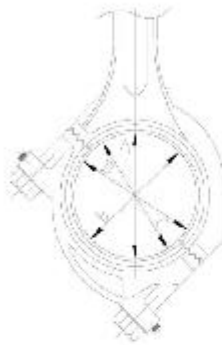
	A	A1	B	B1	C	C1
1	199,99	199,99	200,00	200,00	200,01	200,00
2	200,00	200,01	200,00	200,01	200,01	200,01
3	200,00	200,00	200,03	200,03	200,02	200,02
4	200,00	200,00	200,00	200,00	200,00	200,00
5	199,99	200,00	200,01	200,02	200,01	200,00
6	200,00	200,00	200,00	200,01	200,01	200,01
7	200,01	200,01	200,00	200,01	200,03	200,03





TEKNOMARIN
MARINE TECHNICAL INC.

SHIP REPAIR CONVERTING DRY DOCKING HYDRAULIC
PNEUMATIC MECHANIC ELECTRIC SPARE PART (NEW & USED)



CON. ROD BUSHES MEASURES

S.NO	A	B
1	98,16	98,20
2	98,14	98,20
3	98,14	98,18
4	98,18	98,22
5	98,20	98,20
6	98,2	98,20

CON. ROD MEASURES BEFORE BORING

S.NO	B	A	C
1	172,01	172,01	172,01
2	172,01	172,01	172,01
3	172,01	172,01	172,01
4	172,01	172,01	172,01
5	172,01	172,01	172,01
6	172,01	172,01	172,01



TEKNOMARIN
MARINE TECHNICAL INC.

SHIP REPAIR CONVERTING DRY DOCKING HYDRAULIC
PNEUMATIC MECHANIC ELECTRIC SPARE PART (NEW & USED)



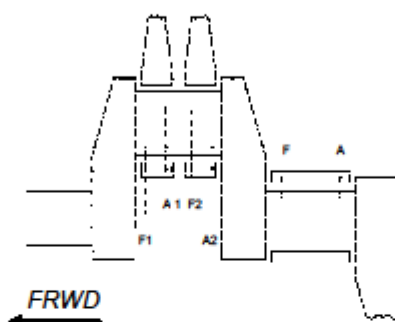


TEKNOMARIN
MARINE TECHNICAL INC.

SHIP REPAIR/CONVERTING DRY DOCKING/HYDRAULIC
PNEUMATIC/MECHANIC/ELECTRIC SPARE PART (NEW & USED)



MAIN AND CON. ROD BEARING CLEARANCES



CRANKSHAFT MAIN JOURNALS

S.NO	A1	A2	A3	B1	B2	B3
1	177,48	177,48	177,48	177,49	177,49	177,50
2	177,49	177,49	177,49	177,50	177,50	177,50
3	177,47	177,48	177,48	177,47	177,48	177,48
4	177,48	177,48	177,49	177,49	177,49	177,50
5	177,47	177,46	177,46	177,48	177,49	177,49
6	177,47	177,48	177,48	177,49	177,50	177,50
7	177,50	177,50	177,50	177,51	177,51	177,51

CRANKPINS

S.NO	A1	A2	A3	B1	B2	B3
1	163,48	163,48	163,48	163,49	163,49	163,49
2	163,46	163,46	163,46	163,47	163,47	163,47
3	163,48	163,48	163,48	163,47	163,47	163,48
4	163,48	163,48	163,48	163,48	163,49	163,50
5	163,48	163,48	163,48	163,49	163,48	163,49
6	163,50	163,50	163,50	163,50	163,50	163,50



TEKNOMARIN
MARINE TECHNICAL INC.

SHIP REPAIR/CONVERTING DRY DOCKING/HYDRAULIC
PNEUMATIC/MECHANIC/ELECTRIC SPARE PART (NEW & USED)





TEKNOMARIN
MARINE TECHNICAL INC.

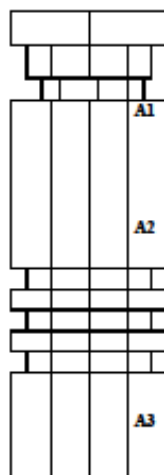
SHIP REPAIR CONVERTING DRY DOCKING HYDRAULIC
PNEUMATIC MECHANIC ELECTRIC SPARE PART (NEW & USED)



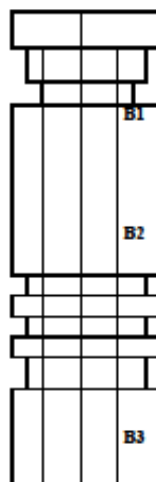
CYLINDER LINER DIMENSIONS

NO	A1	A2	A3	B1	B2	B3
1	225,15	225,10	225,10	225,18	225,10	225,10
2	225,30	225,30	225,20	225,30	225,30	225,20
3	225,30	225,25	225,10	225,30	225,25	225,10
4	225,25	225,20	225,20	225,25	225,20	225,15
5	225,20	225,20	225,10	225,20	225,20	225,10
6	225,25	225,20	225,15	225,25	225,20	225,15
SPARE	225,70	220,60	225,60	225,70	225,60	225,60

FORE ↔ AFT



STBD ↔ PORT

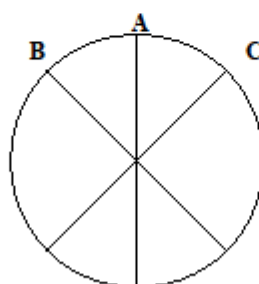


TEKNOMARIN
MARINE TECHNICAL INC.

SHIP REPAIR CONVERTING DRY DOCKING HYDRAULIC
PNEUMATIC MECHANIC ELECTRIC SPARE PART (NEW & USED)



GENERATOR ENGINE NO:3 HITACHI B&W 6323HH



MAIN JOURNAL WITHOUT BEARING

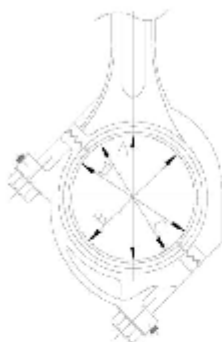
	A	A1	B	B1	C	C1
1	200,00	200,00	200,00	200,01	200,02	200,02
2	200,01	200,02	200,01	200,01	200,01	200,01
3	200,00	200,00	200,03	200,03	200,02	200,01
4	200,01	200,00	200,00	200,00	200,00	200,00
5	200,00	200,00	200,01	200,01	200,00	200,00
6	200,01	200,00	200,00	200,01	200,01	200,01
7	200,00	200,00	200,00	200,00	200,00	200,00





TEKNOMARIN
MARINE TECHNICAL INC.

SHIP REPAIR CONVERTING DRY DOCKING HYDRAULIC
PNEUMATIC MECHANIC ELECTRIC SPARE PART (NEW & USED)



CON. ROD BUSHES

S.NO	A	B
1	98,18	98,20
2	98,18	98,14
3	98,18	98,15
4	98,14	98,08
5	98,20	98,18
6	98,17	98,14

CON. ROD MEASURES BEFORE BORING

S.NO	B	A	C
1	172,01	172,01	172,01
2	172,01	172,01	172,01
3	172,01	172,01	172,01
4	172,01	172,01	172,01
5	172,01	172,01	172,01
6	172,01	172,01	172,01



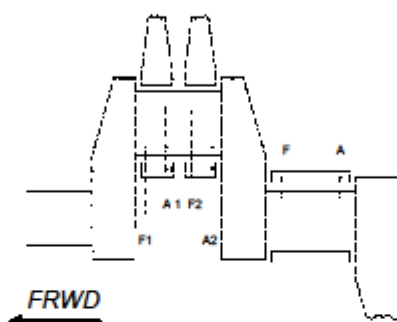
TEKNOMARIN
MARINE TECHNICAL INC.

SHIP REPAIR CONVERTING DRY DOCKING HYDRAULIC
PNEUMATIC MECHANIC ELECTRIC SPARE PART (NEW & USED)





MAIN AND CON. ROD BEARING CLEARANCES



CRANKSHAFT MAIN JOURNAL

S.NO	A1	A2	A3	B1	B2	B3
1	177,48	177,48	177,48	177,49	177,49	177,50
2	177,49	177,49	177,49	177,50	177,50	177,50
3	177,47	177,48	177,48	177,47	177,48	177,48
4	177,48	177,48	177,49	177,49	177,49	177,50
5	177,47	177,46	177,46	177,48	177,49	177,49
6	177,47	177,48	177,48	177,49	177,50	177,50
7	177,50	177,50	177,50	177,51	177,51	177,51

CRANKPINS

S.NO	A1	A2	A3	B1	B2	B3
1	163,48	163,48	163,48	163,49	163,49	163,49
2	163,46	163,46	163,46	163,47	163,47	163,47
3	163,48	163,48	163,48	163,47	163,47	163,48
4	163,48	163,48	163,48	163,48	163,49	163,50
5	163,48	163,48	163,48	163,49	163,48	163,49
6	163,50	163,50	163,50	163,50	163,50	163,50



M/V ALMAWASHI OVERHAUL REPORT



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MARINE TECHNICAL INC.

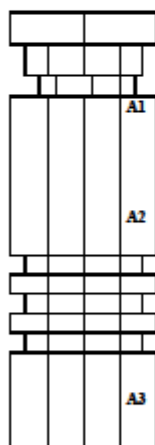
SHIP REPAIR CONVERTING DRY DOCKING HYDRAULIC
PNEUMATIC MECHANIC ELECTRIC SPARE PART (NEW & USED)



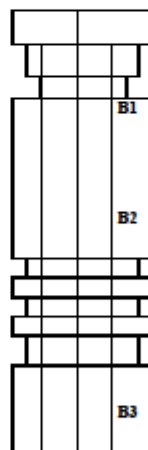
CYLINDER LINER DIMENSIONS

NO	A1	A2	A3	B1	B2	B3
1	225,26	225,15	225,20	225,10	225,14	225,10
2	225,25	225,14	225,12	225,15	225,12	225,08
3	225,25	225,15	225,12	225,15	225,15	225,12
4	225,55	225,55	225,50	225,55	225,50	225,50
5	225,30	225,28	225,10	225,27	225,22	225,07
6	225,21	225,16	225,00	224,90	225,10	225,00

FORE ↔ AFT



STBD ↔ PORT



TEKNOMARIN
MARINE TECHNICAL INC.

SHIP REPAIR CONVERTING DRY DOCKING HYDRAULIC
PNEUMATIC MECHANIC ELECTRIC SPARE PART (NEW & USED)



GENERATOR ENGINE NO:4 YANMAR T260L-ST

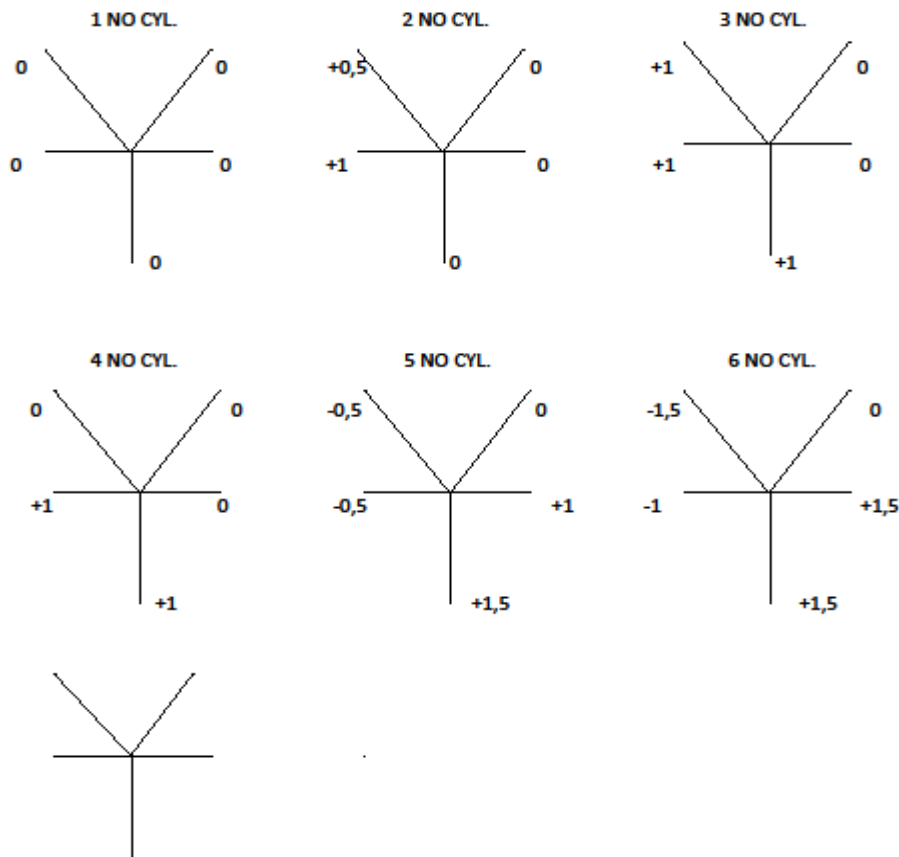


TEKNOMARIN
TEKNİK HİZMETLER LTD. ŞTİ.
MARINE TECHNICAL SERVICES CO. LTD.

• HİDROLİK • HYDRAULIC
• Pnömatik • PNEUMATIC
• MEKANİK • MECHANIC



Owner:HUAZI&GHOSHEH	Date:04/03/2014
Article:GENERATOR ENGINE NO:4	
Inspect.Item: CRANK SHAFT DEFLECTION	
Ship's Name:M/V ALMAWASHI	
Eng.Type:YANMAR T260L-ST	



FINAL RESULT

After collection from the vessel, all units of main engine & generator engines, aux. machineries like pumps, systems are overhauled by **TEKNOMARIN** technicians and delivered to the vessel. The **TEKNOMARIN** Engineers supervised the reassembly of the engine room machineries and the main engine & auxiliary engines were back running in condition and operative.



TEKNOMARIN
MARINE TECHNICAL INC.

SHIP REPAIR CONVERTING DRY DOCKING HYDRAULIC
PNEUMATIC MECHANIC ELECTRIC SPARE PART (NEW & USED)





TEKNOMARIN MARINE TECHNICAL SERVICES INC.

Evliya Çelebi Mah. Rauf Orbay Cad.
Eşref Bitlis Sokak No:2 Tuzla / İSTANBUL

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TEKNOMARIN
MARINE TECHNICAL INC.

SHIP REPAIR CONVERTING DRY DOCKING HYDRAULIC
PNEUMATIC MECHANIC ELECTRIC SPARE PART (NEW & USED)

