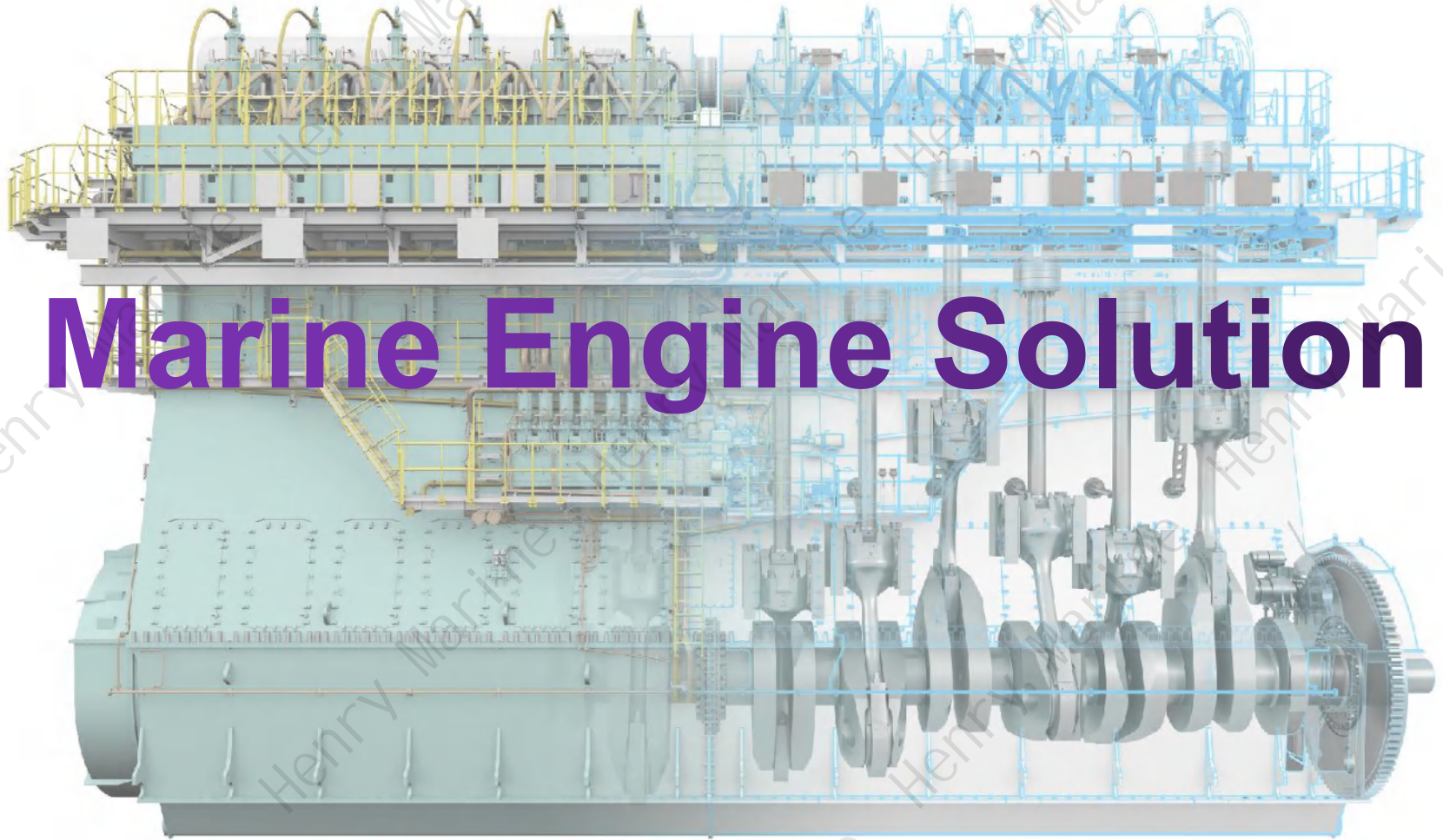
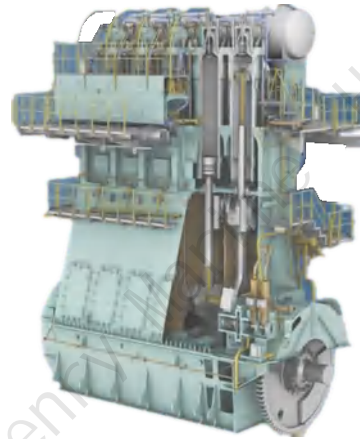


Marine Engine Solution

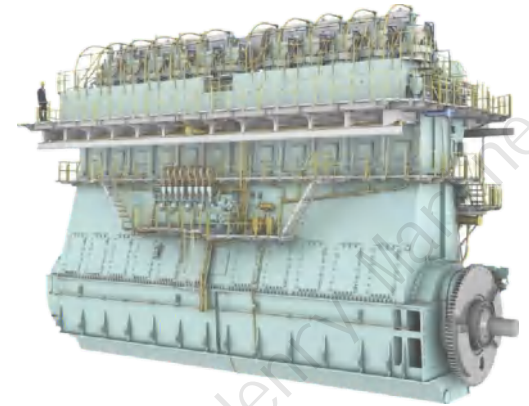




MAN B&W ME-GI



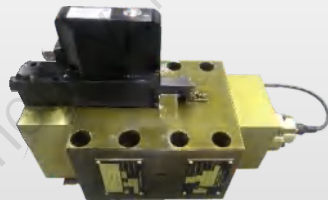
Wärtsilä RT-flex



WinGD



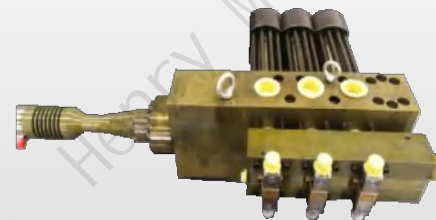
Rexroth HPS Pump



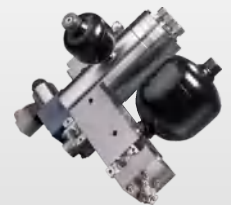
MBD FIVA



Dynex SOP



ICU



Alpha Lubricator



I. Recondition & Calibration Service

- FIVA / ELFI / HPS for MAN engine
- ICU / SOP for Flex、 WINGD engine
- Multi Purpose Controller (MPC) Repair
- Gas Injection Valve (FBIV) Recondition
- Standard Parts Recondition


II. 5 Years Dry Docking Service

- MC-C Control System Maintenance
- MC-C Cylinder Lubricating System Maintenance& Updating
- Electronically Controlled Engine(MEC/MEGI/Flex/WinGD) 5 Years Maintenance
- DG 24000 Hours/5Years Maintenance
- MHI Steam Turbine 5 Years Maintenance
- Boiler Service & Annual Inspection

III. Spare part Sales

- Spare Part for Pneumatic Control System-AVENTICS/NABTESCO
- Spare Part for Electronic Control System-REXROTH/NABTESCO/PARKER
- Spare Part for Lubricating System
- Genuine Part for Boiler

FIVA / ELFI (MBD/NABTESCO/REXROTH) Maintenance & Calibration



Maintenance Plan for FIVA valves			
		5 Years	10 Years
1	Pilot valve	Inspection & Calibration	Exchange
2	Stroke sensor	Inspection & Calibration	Exchange
3	Main valve	Overhaul	Overhaul

FIVA

Overhaul Workshop in
Shanghai and Singapore

- Exchange Program
- Pit Stop
- Trouble Shooting
- Routing Maintenance
- On Board Overhaul



Work Scope

- Cleaning and inspection of the valve housing & main spool
- Replacement of control valve and repair kit by original parts
- Replacement and calibration of the proportional valve & sensor
- Function test
- Issue the service report

FIVA / ELFI (MBD/NABTESCO/REXROTH) Maintenance & Calibration

Detail Data of Calibration and Function Test					
Serial No	#2		Type	STW 0175-14/	
New pilot valve	None		New position sensor	None	
Overhaul to check the electro-mechanical convertor and coil				Ok	
Control spool and bush is examined under a microscope				Ok	
Proportional valve on bench to testing				Ok	
Oil temperature	Reference value	42 °C ± 1 °C	Oil pressure	Reference value	250 ± 3bar
	Measured value	42.04°C		Measured value	250.16bar
Flow rate	Reference value	15 ± 0.2L/min	Zero adjustment	Reference value	12.20 ± 0.02mA
	Measured value	15.08 L/min		Measured value	12.20 mA
FIVA valve is function test, calibrate and internal leakage measurement				6.79 L/min	
Output signal from inductive sensor in both extreme positions				5.30 mA / 19.16 mA	
Output signal of default position (on loss of pilot valve command signal)				5.30 mA	
Output signal stamped on the name plate (original)				12.24 mA	
Output signal from new inductive sensor when calibration rod is mounted				12.20 mA	
Result:	Overhaul, Maintenance, Calibration, FIVA is in working condition, Function Testing is acceptable;				

HPS Pump (Rexroth/Paker/Eaton) Maintenance & Calibration



Work Scope:

- Cleaning and inspection
- Replacement of repair kit by original parts
- Replacement / calibration of the proportional valve & sensor
- Function test



Test Bench:

- Simulate engine running condition via proportional valve during testing
- Carry out pump testing up to 750L/mins capacity
- Calibrate proportional valve & inductive sensor and safety check
- Graphic display
- Issue the service report

Recondition & Calibration Service

Henry Marine Service Co.,Ltd

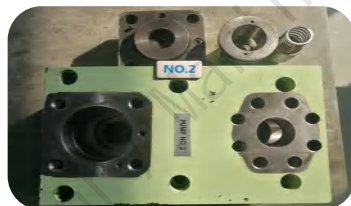
Maintenance & Calibration for MAN engine

HPS Pump (Rexroth/Paker/Eaton) Maintenance Program

DISASSEMBLY



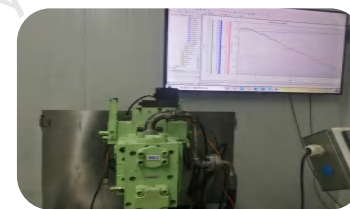
CLEANING



INSPECTION



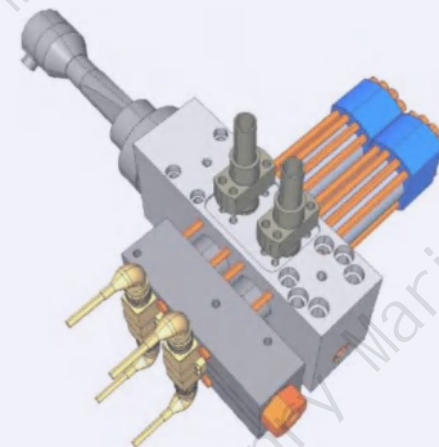
CALIBRATION



ICU Maintenance Program

Item Category List

- ✓ Size 0 Rt-flex48T-D / 50 / 50B / 50-D
- ✓ Size 1 Rt-flex50T-B / 50T-D / 50T-E / 60C / 60C-B
- ✓ Size 2 Rt-flex68-B / 68-D
- ✓ Size 3 Rt-flex 68-D / 82T-D / W-X82 / 82-B
- ✓ Size 4 Rt-flex84T-D / 96C-B
- ✓ Size 5 W-X82DF / 92 / 92DF



Injection control block



Fuel quantity sensor



Rail valve

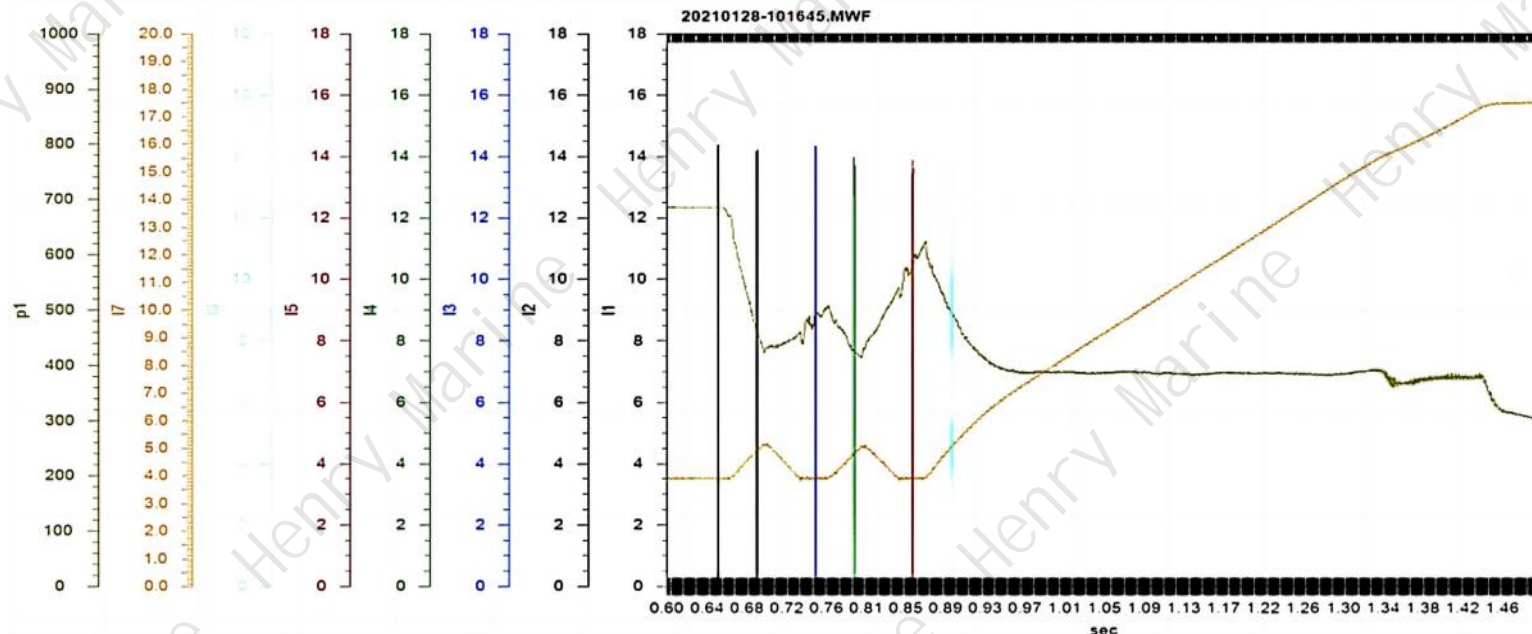


ICU on test bench

ICU Test & Calibration Bench

Function test on bench to simulated engine condition

Test Pressure / 测试压力	<input type="checkbox"/> 1200bar <input checked="" type="checkbox"/> 900bar	Fuel oil quantity sensor stroke	3-21mA
Oil Temperature/ 测试温度	42°C	FQ sensor return value	3.9 mA
Oil cleanliness grade NAS	NAS 7	FQ sensor max. injection value	16.2 mA



SOP (Dynex / Hawe Pump) Maintenance & Calibration



Dynex / Hawe Pump Maintenance



SOP (Dynex / Hawe Pump) Maintenance & Calibration



Dismantle the block



Clean & inspect



Reassemble pump

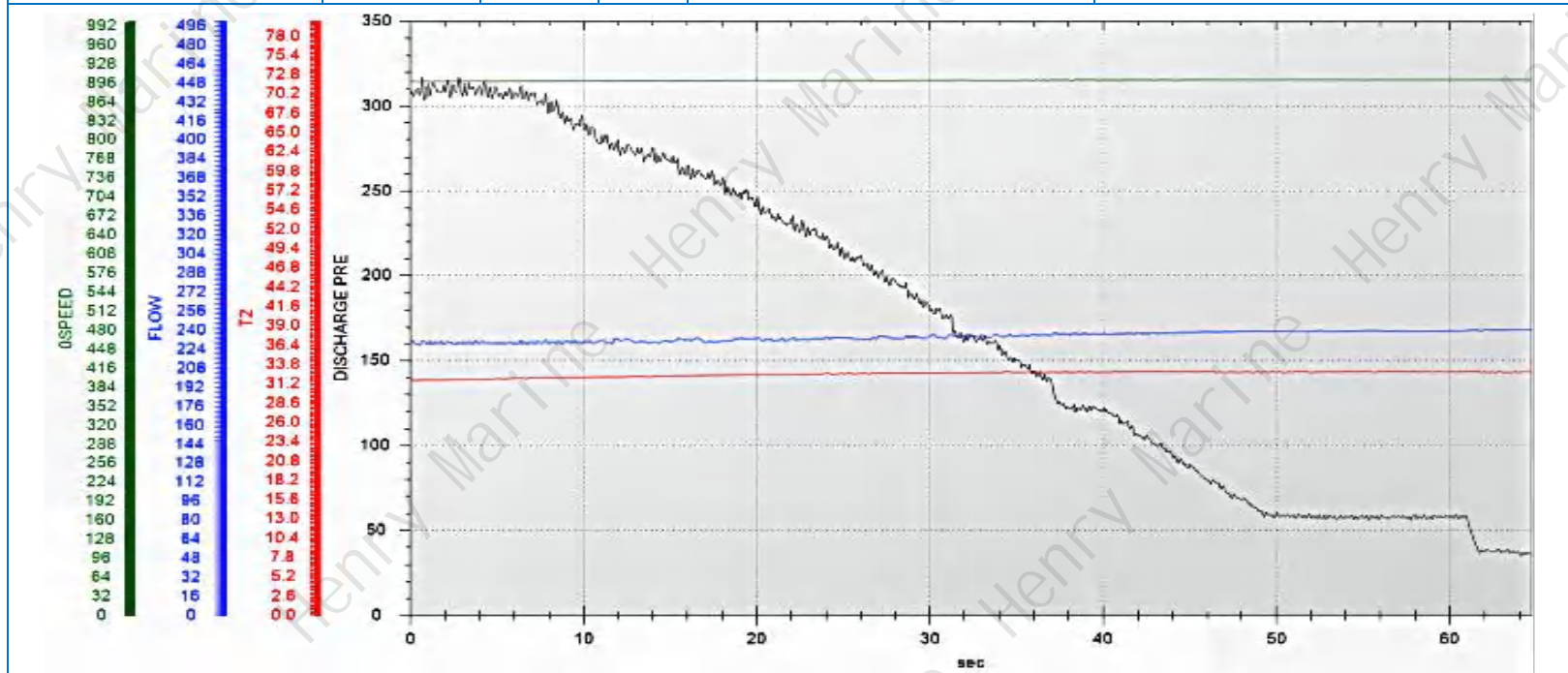


SOP on test bench

SOP (Dynex / Hawe Pump) Maintenance & Calibration

Servo Oil Pump on test bench to simulated engine condition

Rotation	<input type="checkbox"/> R <input checked="" type="checkbox"/> L	Oil cleanliness grade NAS	NAS 7
Test Speed	700 RPM	Max. displacement @1300rpm	371 cm3
Temperature	24.5 °C	Test flow rate	210 L/min



Result: Overhaul/Calibration, Servo Oil Pump is in working condition, function testing is acceptable

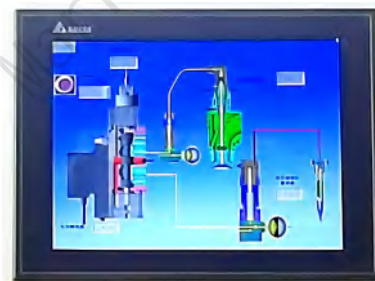
Multi Purpose Controller (MPC) Repair



MPC

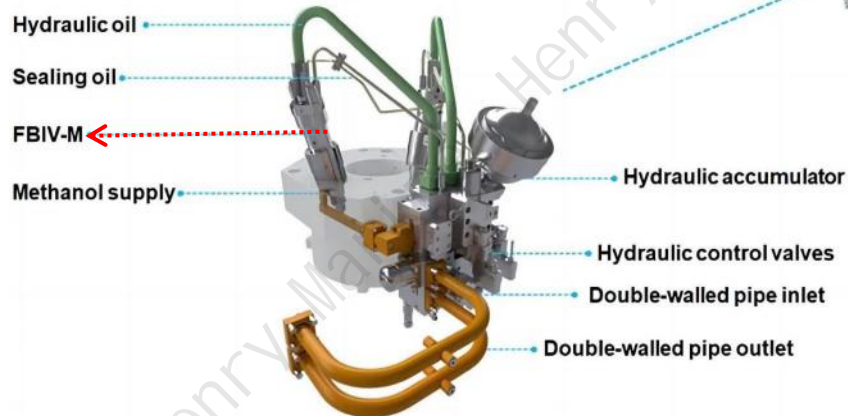
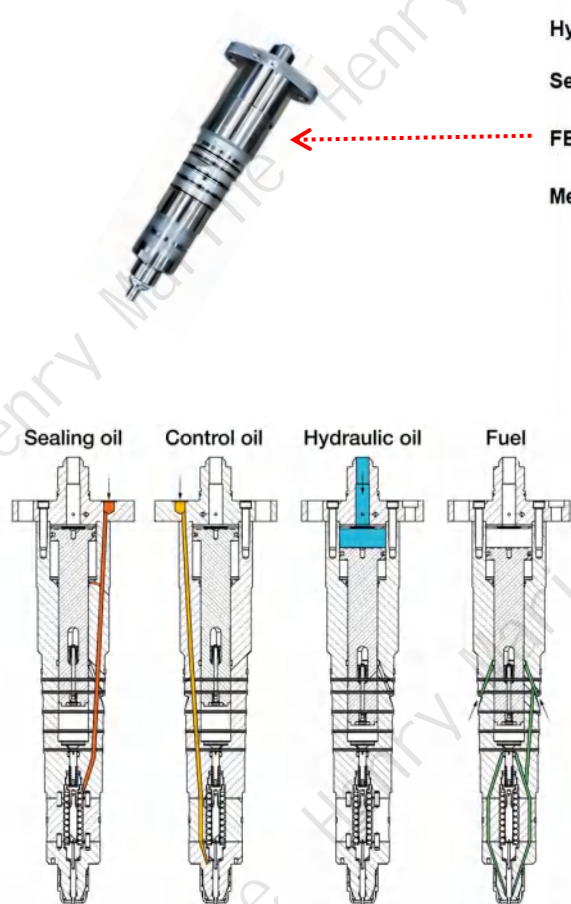


MPC-10



Repair MPC or MPC-10 at workshop and connect to MOP & Simulator, carry out function test for FIVA / HPS/TACHO etc.

Gas Injection Valve (FBIV) Recondition



Two or three second fuel FBIVs (fuel booster injection valves) are mounted in the cylinder cover. The fuel flows from the fuel control block, through the cylinder cover, and then either directly to the FBIV (two FBIVs), or to the closest FBIV and then, through gas pipes on top of the cover, to the remaining FBIVs (three FBIVs).

Recondition for Piston / Cylinder head etc. of Main Engine



Fuel Injector



Exh.Valve Spindle



Cylinder Head



Piston Crown

5 Years Dry Docking Service

Henry Marine Service Co.,Ltd

➤ MC Control System Maintenance

PMS :

Overhaul pneumatic valve with repair kit



BMS :

System inspection and calibration



GOV :

System inspection and calibration



5 Years Dry Docking Service

Henry Marine Service Co.,Ltd

PMS :overhaul pneumatic valve / air cylinder/actuator with repair kit



BMS:system inspection and calibration



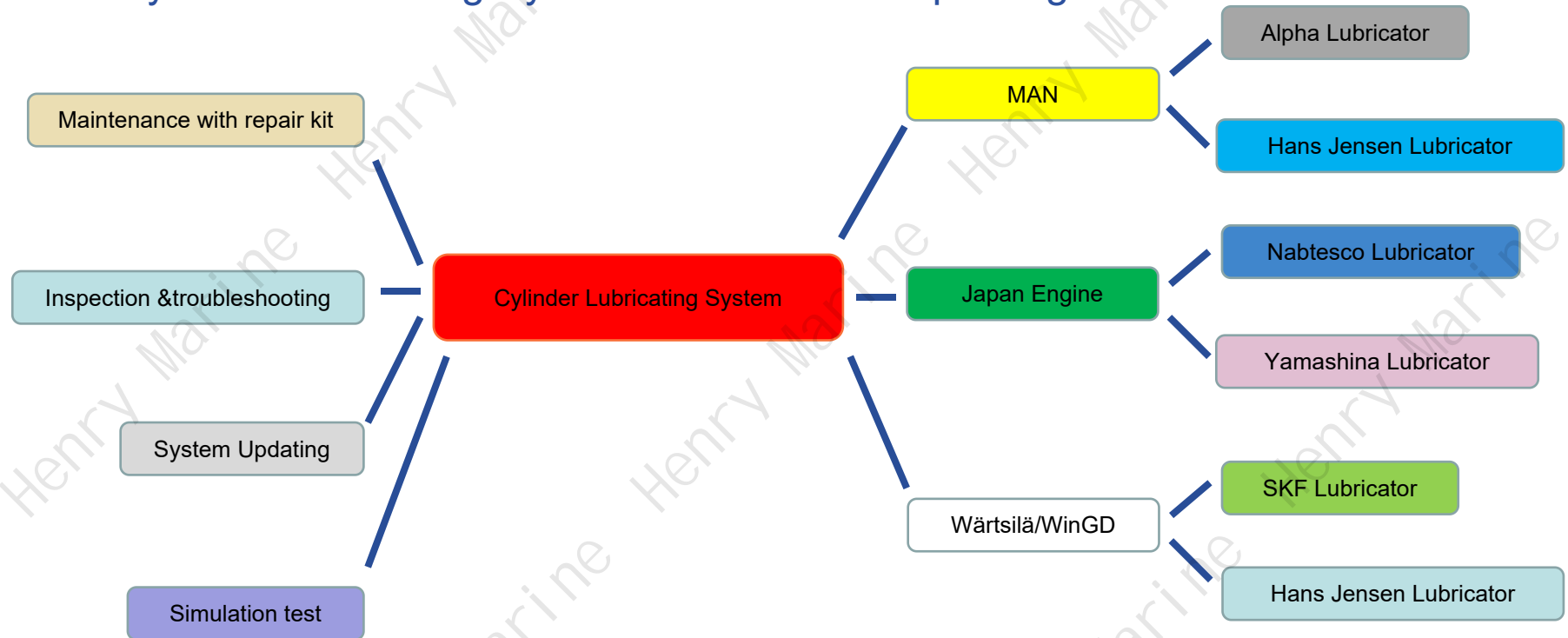
GOV:overhaul with repair kit / system inspection / calibration



5 Years Dry Docking Service

Henry Marine Service Co.,Ltd

➤ ME Cylinder Lubricating System Maintenance & Updating



Alpha Lubricator



Hans Jensen Lubricator



Nabtesco Lubricator



SKF Lubricator

5 Years Dry Docking Service

Henry Marine Service Co.,Ltd

➤ ME Cylinder Lubricating System Maintenance & Updating



Overhaul cylinder lubricating system with spare parts



Inspect & calibrate cylinder lubricating system

5 Years Dry Docking Service

Henry Marine Service Co.,Ltd

➤ Electronically Controlled Engine 5 Years Maintenance



1. Fuel booster

32,000 R/H



2. exh.valve actuator

32,000 R/H



3. Accumulator

32,000 R/H



4. FIVA valve

32,000 R/H



5. Cylinder lubricator

32,000 R/H



6. Distributor block

32,000 R/H



5 Years Dry Docking Service

Henry Marine Service Co.,Ltd

➤ Electronically Controlled Engine 5 Years Maintenance



1. Accumulator block

32,000 R/H



2. Hydraulic hose

32,000 R/H



3. Accumulator

32,000 R/H



4. Compensator

32,000 R/H



5 Years Dry Docking Service

Henry Marine Service Co.,Ltd

➤ Electronically Controlled Engine 5 Years Maintenance



Electric control panel

32,000 R/H



MPC

32,000 R/H



Level switch

32,000 R/H



ETC.,

32,000 R/H



5 Years Dry Docking Service

Henry Marine Service Co.,Ltd

➤ Electronically Controlled Engine 5 Years Maintenance



Pneumatic system

32,000 R/H



Chain re-tighten

4,000 R/H



Chain tightener

4,000 R/H



Guide bar

4,000 R/H

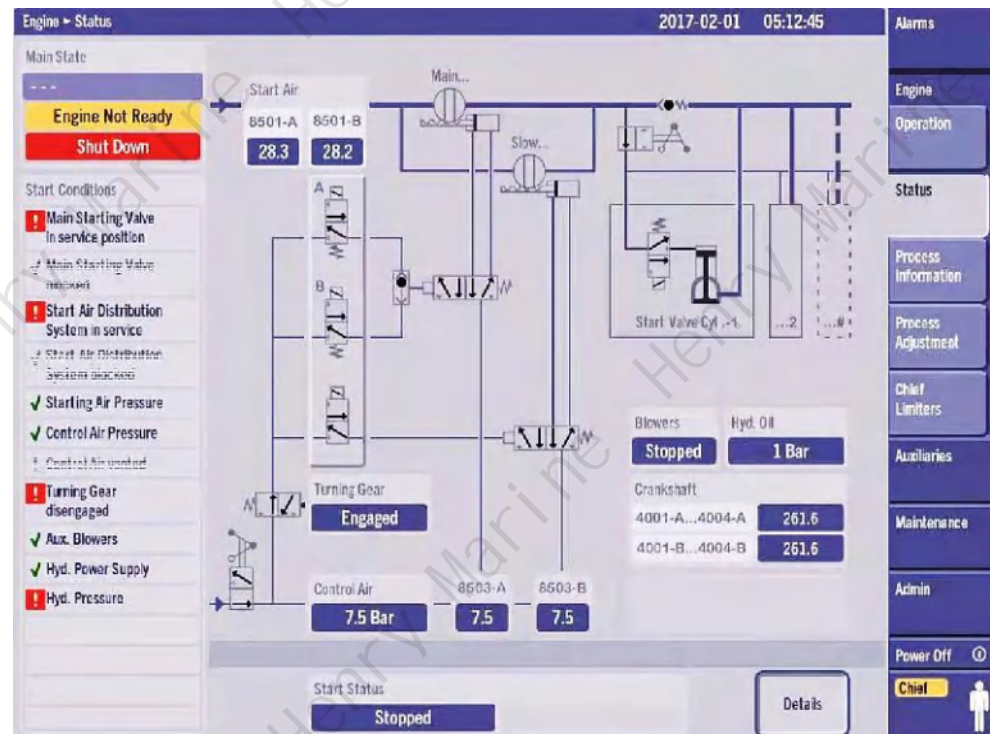


➤ Electronically Controlled Engine 5 Years Maintenance Start

Blocked & Not ready & Standby Function Test

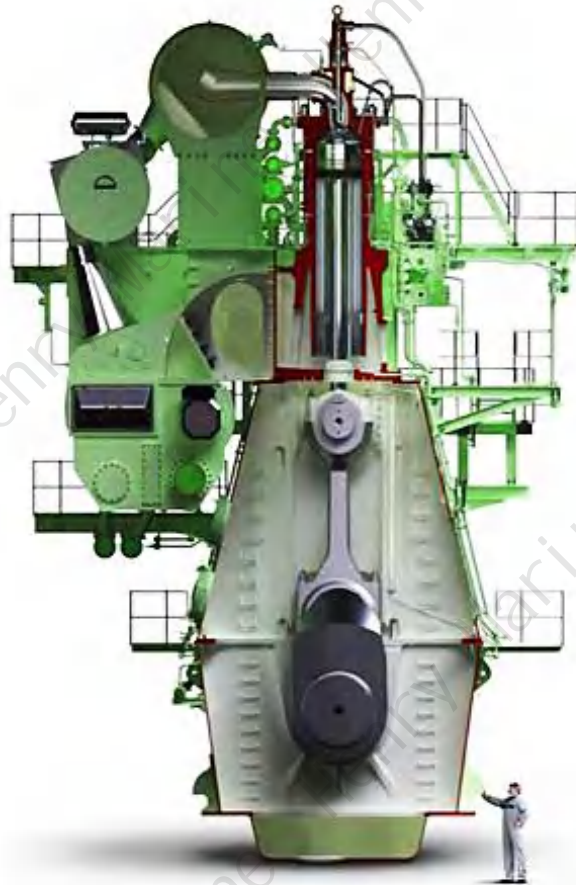


- Slow down and Shut down
- Main starting air valve function test
- Starting air pilot valve function test
- Control air pressure low (5.5bar)
- Cylinder lubricator function test
- Turning gear engage
- Aux. blower not running
- Hydraulic pressure low (170bar)



- Electronically Controlled Engine 5 Years Maintenance

Calibration & Function Test List



- 1) Calibration for inductive sensor**
 - Exhaust valve
 - Fuel plunger
 - FIVA valve
- 2) Calibration for swash plate positioner**
- 3) Calibration for exhaust bypass system**
- 4) Calibration for telegraph handle**
- 5) Function test for tachometer system**
- 6) Function test for safety device**

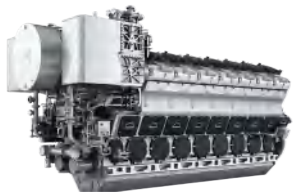
5 Years Dry Docking Service

Henry Marine Service Co.,Ltd

➤ DG 24000 Hours/5Years Maintenance

Maintenance Table

Cylinder Head	Piston	Cylinder Liner	Connect Rod	Main bearing
Camshaft	Crankshaft	Timing Gear	Fuel pump	Lubricating Pump
Cooling Pump	Air Cooler	Lub.Oil Pump	Turbocharger	Governor



MAN



DAIHATSU



HIMSEN



WÄRTSILÄ

5 Years Dry Docking Service

Henry Marine Service Co.,Ltd

➤ DG 24000 Hours/5Years Maintenance -- 80% Load test@4130kw



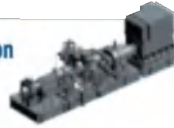
5 Years Dry Docking Service

Henry Marine Service Co.,Ltd

➤ Steam Turbine 5 Years Maintenance-**Authorized by MITSUBISHI**

Marine TurbineSection

- Condensing System
- Steam Turbine
- Reduction Gear & SSS Clutch
- Generator



Series Selection Table

Turbines	Type	Horizontal, multi-stage impulse condensing turbine			
	No. of stages	4 to 8 Rateau		4 to 14 Rateau	
	power range (kW)	200 ~2,000	1,000 ~4,000	1,500 ~6,000	3,000 ~15,000
	Speed range (rpm)	11,000 ~15,000	8,500 ~11,700	6,500 ~9,500	5,000 ~7,500
	Steam inlet pressure (Mpa)	0.4 to 12.3			
	Steam inlet temperature(°C)	Saturated temperature to 540			
	Exhaust pressure (mmHg)	400~722			

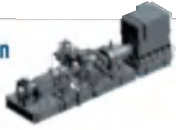
5 Years Dry Docking Service

Henry Marine Service Co.,Ltd

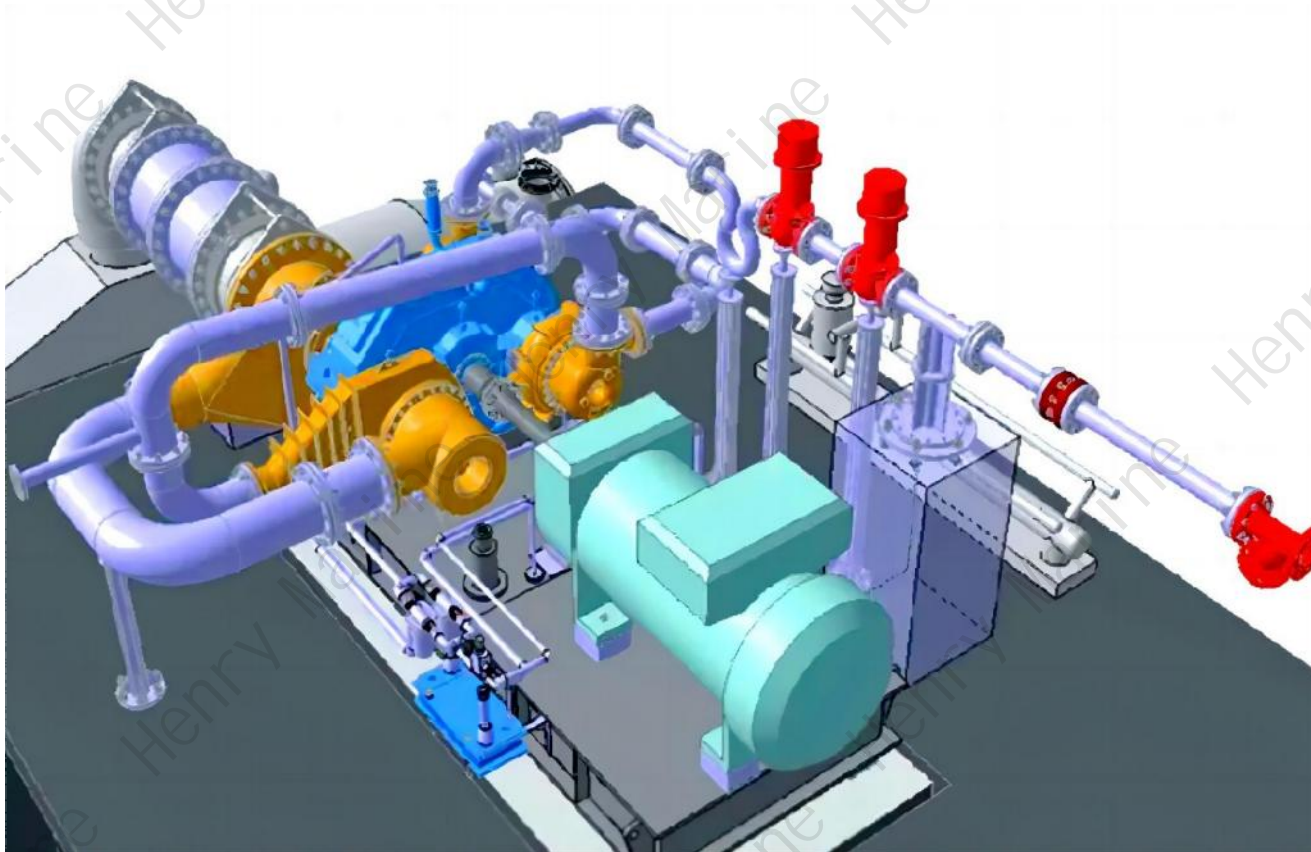
➤ Steam Turbine 5 Years Maintenance-Authorized by **MITSUBISHI**

Marine TurbineSection

- Condensing System
- Steam Turbine
- Reduction Gear & SSS Clutch
- Generator



System View



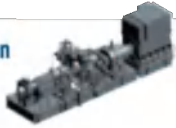
5 Years Dry Docking Service

Henry Marine Service Co.,Ltd

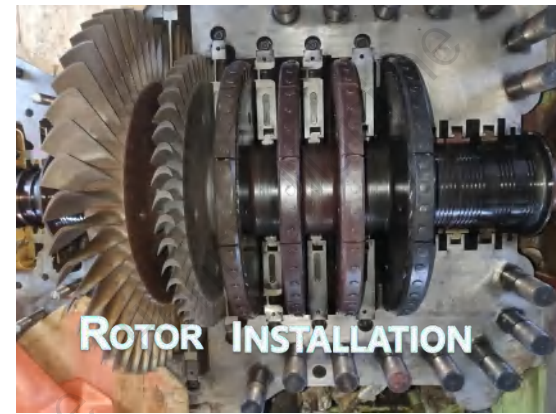
➤ Steam Turbine 5 Years Maintenance-**Authorized by MITSUBISHI**

Marine TurbineSection

- Condensing System
- Steam Turbine
- Reduction Gear & SSS Clutch
- Generator



Key Point Display



5 Years Dry Docking Service

Henry Marine Service Co.,Ltd

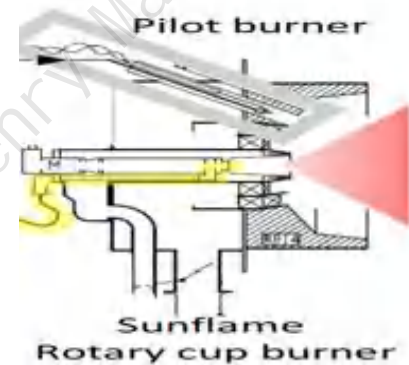
➤ Boiler Service & Annual Inspection

*Troubleshooting for Control System

*Burner Updating

*Tube & Plate Renewal

*Annual Inspection / Class Survey



5 Years Dry Docking Service

Henry Marine Service Co.,Ltd

➤ Boiler Service & Annual Inspection

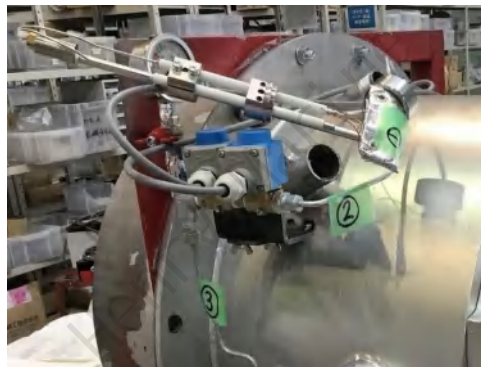
Burner Updating---M.G.O. Change Over



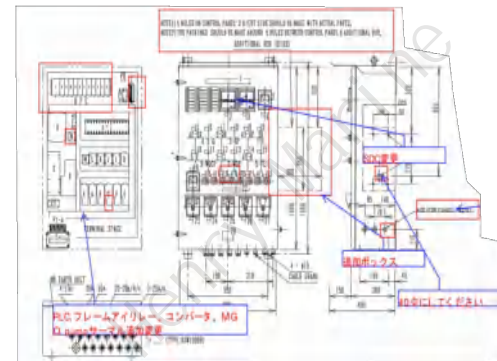
Piping Unit



Pump Station Modification



Burner Modification

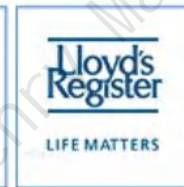


Control System Modification

➤ Boiler Service & Annual Inspection

Tube & Plate Renewal Plan

- Description of Boiler
- Boiler sketch and job scope
- Procedure for replacement of tube
- Procedure for replacement of tube plate
- Hydro-static test the boiler to 1.5 times designed pressure witnessed by Class Surveyor and ship side
- Newly put refractory in furnace bottom
- Box up the boiler properly



- Spare Part for Pneumatic Control System-**Authorized by AVENTICS**



➤ Spare Part for Pneumatic Control System-**Authorized by AVENTICS**

Air supply management

Air preparation units, pressure sensors, pneumatic connection technology



Directional control valves



TC08/15

ES05

L1/L2

519/520/521

490/579/589

CL03-EV

551

CD04/07/12

AP

AS3-SV

LS04

563/565/567

ST

563-018/131

740/840

➤ Spare Part for Electronic Control System-**Authorized by rexroth**

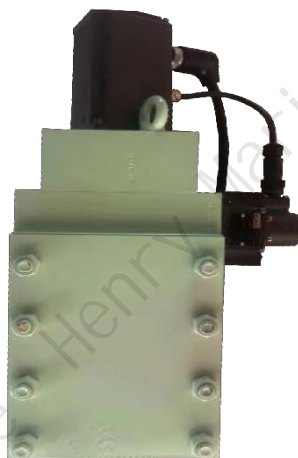
Hydraulic Power Syetem



HPS Pump

Proportional Valve

Inductive Sensor



FVIA

Proportional Valve

Inductive Sensor



Valve Block

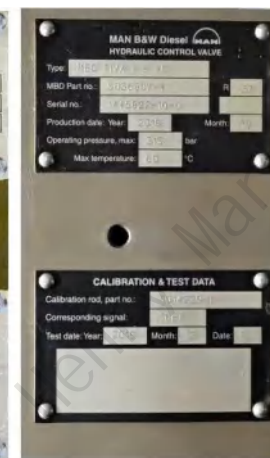
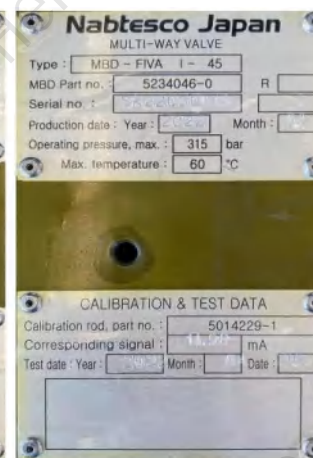
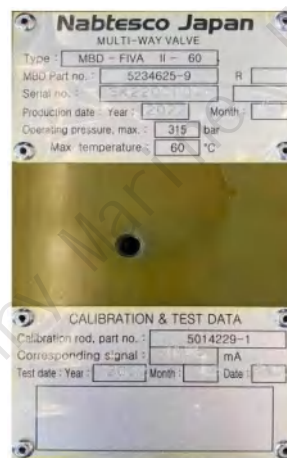
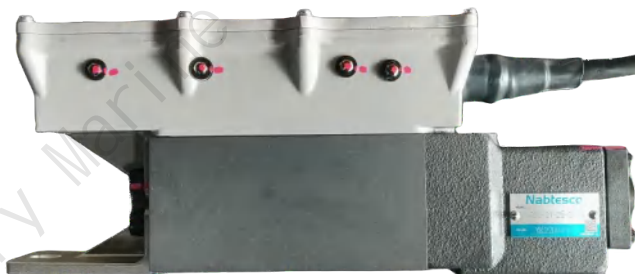
Solenoid Valve

Pressure Switch

➤ Spare Part for Electronic Control System-Authorized by



Hydraulic Power System



FIVA-I-45	FIVA VALVE	5234046-0	Nabeco
FIVA-II-60	FIVA VALVE	5234625-9	Nabeco
FIVA-I-45	FIVA VALVE	5036807-4	MAN
FIVA-II-60	FIVA VALVE	5032039-5	MAN

➤ Spare Part for Electronic Control System-**Authorized by**



Hydraulic Power System



PV016/28 PUMP	Electrolled Controlled Engings	16/28
PV032/46 PUMP	Electrolled Controlled Engings	32/46
PV063/92 PUMP	Electrolled Controlled Engings	63/92



D1FPE50MA9NS0039XG264-MA	Proportional Valve	250-750
D1FPE50HA9NS0039XG264-HA	Proportional Valve	125-180
D1FPE50FA9NS0039XG264-FA	Proportional Valve	40-71
D1FPE50HB9NS0039XG267-HB	Proportional Valve	FIVA- I
D1FPE50FB9NS0039XG265-FB	Proportional Valve	ELFI
D1FPE50MB9NS0039XG267-MB	Proportional Valve	FIVA-II

- Spare Part for Alp.Lub. of MC/MEC type Authorized by 

Cylinder Liner Alpha Lubricating System



Maintenance and Service Kit



New Spare for Lubricator

Cooperation partner

Henry Marine Service Co.,Ltd

Authorization Cooperation Agreement Approved by



DOOSAN

Sales Agent of ME Spare Part Approved by

rexroth

AVENTICS



Nabtesco

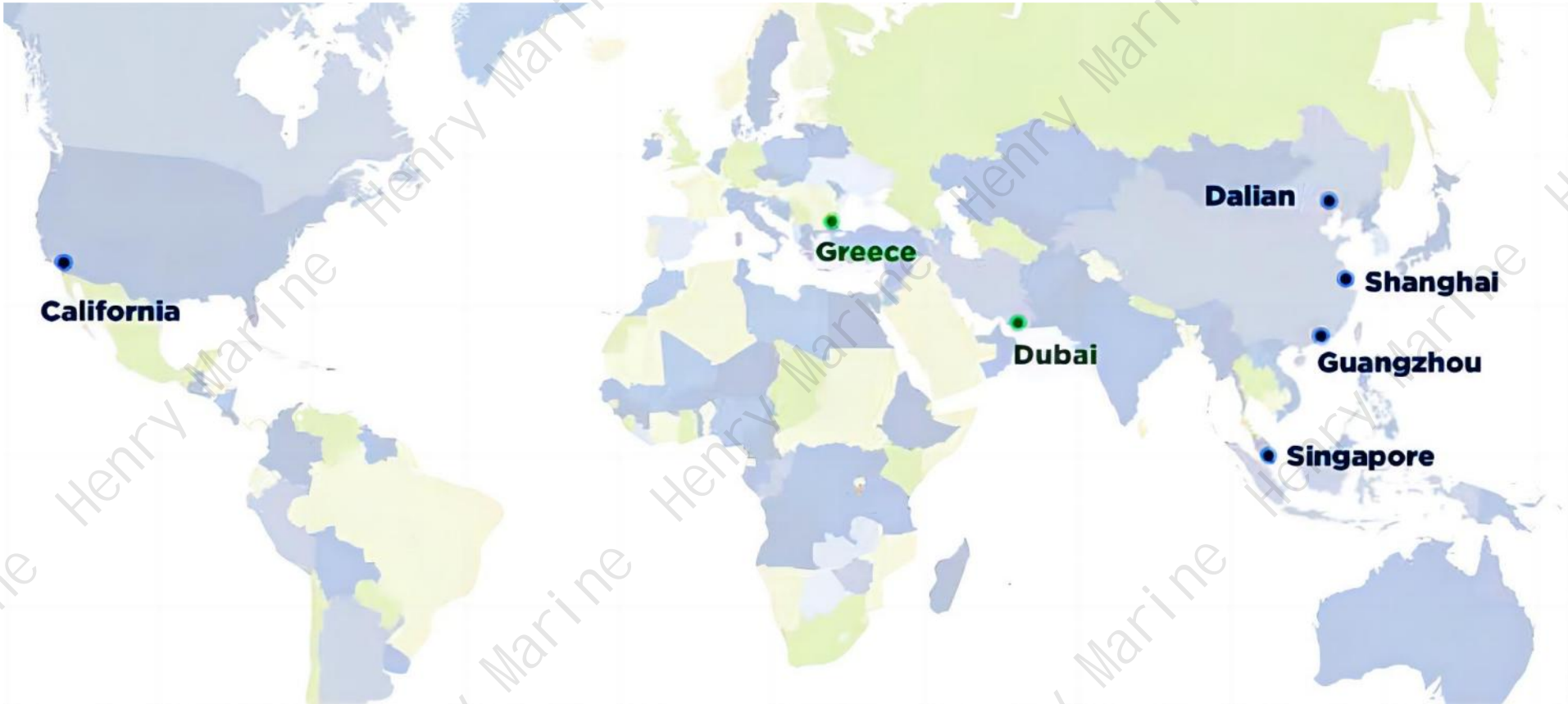
CONTRINEX

ABS Quality Evaluations Certificate



Contact Us

Henry Marine Service Co.,Ltd



Henry Marine Network
Provide 24hours service to support customer

Contact Us

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