

Service Report

Ship Name:	M/V MSC ALABAMA III	Service Item
IMO NO.:	9123166	☐ Repair
Equipment:	STEERING GEAR	☒ Overhaul
Date:	23-Jun-24	☐ Inspection
Location:	HRDD	☐ Modification
Project:	pump and valve O/H, Ram seals renewed	☐ Sea Trial
☒ charge to customer ☐ Under Guarantee		☐ Other

Work Performed				
MACHINE MAKER & MODEL: HATLAPA & R4ST-550				
1.NO.1 hydraulic pump overhauled,inspected cleaned and measured,bearing and seal kit renewed.				
2.NO.2 hydraulic pump overhauled,inspected cleaned and measured,bearing and seal kit renewed,cylinder barrel and valve plate damaged,replaced with new spare parts.				
3.NO.1&2 pump line filter element renewed.				
4.NO.1&2 pump pressure measure joints renewed.				
5.NO.1&2 pump control solenoid valve renewed.				
6.NO.1&2 pump coupling spider renewed.				
7.All ram seals V-packing renewed,adjusted clearance between cylinder and gland packing.				
8.NO.1~4 cylinder pressure gauge renewed.				
9.NO.1&2 pump coupling spider renewed.				
10.Valves overhauled,seal kit renewed.				
11.Pipe flange gasket renewed.				
12.Expansion oil tank refill with fresh oil.				
13.Running test, work in normal.				
Parts used:	Remarks:			
1.Pump bearing kit *2sets.	1.Check coupling spider condition monthly.			
2.Pump seal kit *2sets.				
3.Valves seal kit *2sets.				
4.Cylinder barrel and valve plate *1set(A4V125).				
5.Pressure gauge *4pcs.				
6.Coupling spider *2pcs.				
7.Filter element *2pcs.				
8.Pressure measure joint *12pcs.				
9.Control solenoid valve *2sets.				
Time sheet				
Date	Start	Finish	Work/Travel	Q' ty
2, 10, 22, 24-Jun-24	0800	1700	travelling	2 man
3~9, 23-Jun-24	0800	1700	working	2 man

※This is to certify that above service/delivery has been carried out satisfactorily.

Service Engineer

Superintendent/Chief Engineer

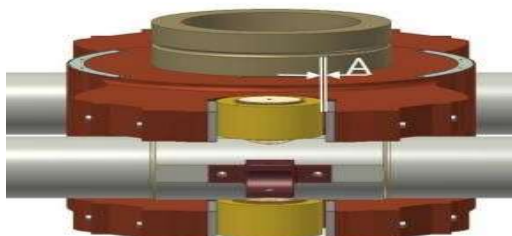
MEASURING REPORT

MACHINE MAKER & MODEL: HATLAPA & R4ST-550

1. Measuring mechanical clearances

Clearance between tiller and roller bearing(A)

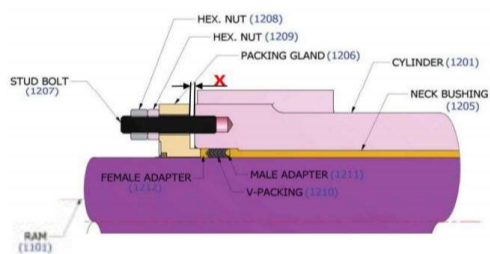
unit: mm



	Top	Lower	Judgement	Remark
	Upper Limit: 0.5			
FWD	0.45	0.45	NORMAL	
AFT	0.45	0.45	NORMAL	

Clearance between cylinder and gland packing(X)

unit: mm

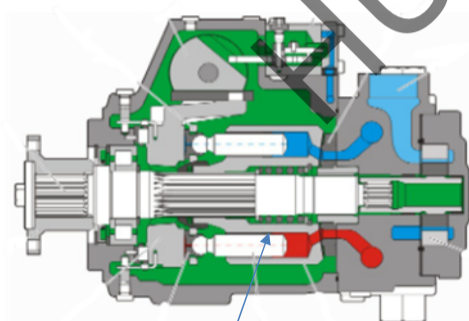


Remark: All ram seals renewed DD

	Lower Limit: 5	Judgement	Remark
No.1	3	ALERTS	LEAK
No.2	3	ALERTS	LEAK
No.3	3	ALERTS	LEAK
No.4	3	ALERTS	LEAK

Clearance between cylinder hole and piston(C)

unit: mm



C

A4V PUMP

Remark: NO.2 cylinder barrel renewed DD O/H

NO.1	C	NO.2	C
1	0.09	1	0.05
2	0.09	2	0.05
3	0.09	3	0.05
4	0.09	4	0.05
5	0.09	5	0.05
6	0.09	6	0.05
7	0.09	7	0.05
8	0.09	8	0.05
9	0.09	9	0.05
	Upper Limit: 0.10		Upper Limit: 0.10
C max.	0.09	C max.	0.05
Judgement	NORMAL	Judgement	NORMAL

MEASURING REPORT

MACHINE MAKER & MODEL: HATLAPA & R4ST-550

2. Visual inspection

2.1 Condition for Filter

	Condition of element	Judgement	Remark
No.1 system	DIRTY	ALERTS	Renewed
No.2 system	DIRTY	ALERTS	Renewed
No.3 system			Not applied
No.4 system			Not applied

2.2 Oil leakage from Hydraulic pump, Valve block and Pipe

	pump	valve	block valve	pipe o-ring	gasket	Isolation valve	Remark
No.1 system	X	X	X	X	X	X	Overhauled
No.2 system	X	X	X	X	X	X	Overhauled
No.3 system							Not applied
No.4 system							Not applied

Note: "√" means good condition, "×" means leaking

2.3 Oil leakage from Hydraulic cylinder

	Amount of oil leakage	Judgement	Remark
	Criteria: Below 2 drops/ min		
No.1 cylinder	Leakage	V-packing damage	V-packing Renewed
No.2 cylinder	Leakage	V-packing damage	V-packing Renewed
No.3 cylinder	Leakage	V-packing damage	V-packing Renewed
No.4 cylinder	Leakage	V-packing damage	V-packing Renewed

2.4 Scratch on Ram surface

	Condition	Judgement	Remark
FWD	Deeply Scratch	ALERTS	Polished
AFT	Deeply Scratch	ALERTS	Polished

2.5 Condition of Pressure gauge

	No	Condition	Judgement	Remark
Cylinder pressure gauge	No.1	Damage	Damage	Renewed
	No.2	Damage	Damage	Renewed
	No.3	Damage	Damage	Renewed
	No.4	Damage	Damage	Renewed
Pressure measure joint	No.1	Damage	Damage	Renewed
	No.2	Damage	Damage	Renewed
	No.3			Not applied
	No.4			Not applied

MACHINE MAKER & MODEL: HATLAPA & R4ST-550
 2.6 Wear condition of chain coupling and spider coupling

	Condition	Judgement	Remark
No.1	Spider aged	ALERTS	Renewed
No.2	Spider aged	ALERTS	Renewed
No.3			Not applied
No.4			Not applied

2.7 Plays of linkage mechanism for feed back unit and rudder angle transmitter

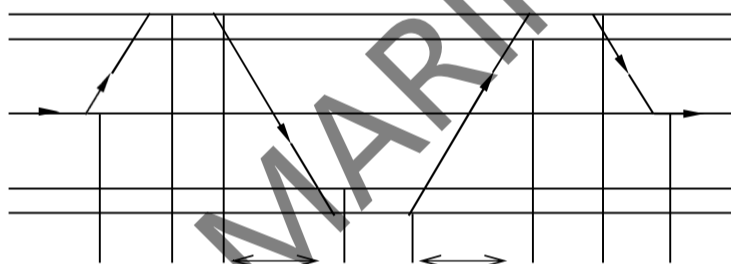
	Condition	Judgement	Remark
Rudder angle transmitter	Normal	Normal	
No.1 feedback unit	Normal	Normal	
No.2 feedback unit	Normal	Normal	
No.3 feedback unit			Not applied
No.4 feedback unit			Not applied

3. Operation test

Starboard 35°
 Starboard 30°

Midship

Port 30°
 Port 35°

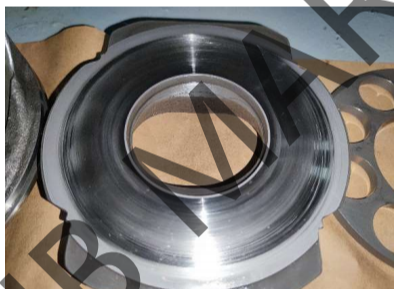


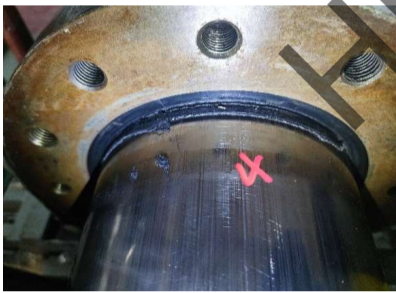
3.1 Rudder turning speed (Criterion; 65 deg within 28 sec)

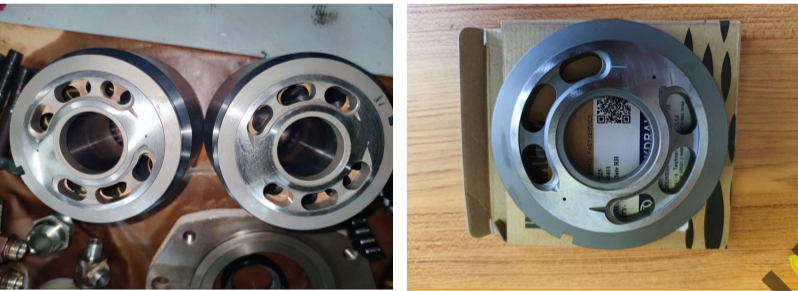
	STBD => PORT		PORT => STBD	
	Time	main pressure	Time	main pressure
No.1 pump	23sec	18bar	23sec	18bar
No.2 pump	22sec	18bar	22sec	18bar
No.3 pump				
No.4 pump				
No.1 & No.2	12sec	25bar	12sec	25bar
No.3 & No.4				

MACHINE MAKER & MODEL: HATLAPA & R4ST-550			
3.2 Abnormal noise (Criterion; no abnormal noise)			
	Abnormal noise	Place of noise	Remark
No.1 unit	NO	NO	
No.2 unit	NO	NO	
No.3 unit			Not applied
No.4 unit			Not applied
3.3 Condition of isolation valve			
	isolation valve	Judgement	Remark
No.1	Leakage	Overhauled	
No.2	Leakage	Overhauled	
No.3			Not applied
No.4			Not applied
3.4 Safety valve test (Design setting pressure: 25 MPa)			
	Port	Starboard	Remark
No.1 pump unit	250bar	250bar	
No.2 pump unit	250bar	250bar	
No.3 pump unit			Not applied
No.4 pump unit			Not applied
3.5 Neutral position of Hydraulic pump (Criterion; 0.5 deg/2min)			
	Movement	Judgement	Remark
No.1 pump	0 deg/2 min	Normal	
No.2 pump	0 deg/2 min	Normal	
No.3 pump			Not applied
No.4 pump			Not applied
3.6 Condition of limit switch			
	Condition	Judgement	Remark
Port			
STBD			

ITEM	DESCRIPTION	REMARK
1	 	NO.1 pump bearing damaged.
2	 	NO.1 valve plate and cylinder barrel.
3	 	NO.1 piston and swash plate.
4	 	NO.1 front cover and casing.
5	 	NO.1 shaft and Aux. pump.

ITEM	DESCRIPTION	REMARK
1	 	NO.2 pump retainer plate.
2	 	NO.2 valve plate and cylinder barrel damaged.
3	 	NO.2 piston and cam.
4	 	NO.2 cam seat and casing.
5	 	NO.2 shaft and Aux. pump.

ITEM	DESCRIPTION	REMARK
1	 	NO.1 cylinder V-packing replaced.
2	 	NO.2 cylinder V-packing replaced.
3	 	NO.3 cylinder V-packing replaced.
4	 	NO.4 cylinder V-packing replaced.
5	 	NO.1~4 ram surface deeply scratch.

ITEM	DESCRIPTION	REMARK
1		cylinder barrel
2		valve plate
3		bearing kit and seal kit
4		V-packing and filter element
5		pressure gauge and spider