

Date of writing report 12th Sept. 1963 Received London 26 SEP 1963 Port Rotterdam No. 56831

Survey held at FLUSHING No. of visits in shop 27 First date 19-10-1962 Last date 11-9-1963

FIRST ENTRY REPORT ON MAIN ENGINE REDUCTION GEARING

Name of Ship "POOLSTER" Owners Royal Netherlands Navy

Hull built at Rotterdam by Rotterdam Drydock Comp. Yard No. 307 Year

Main engines made at by Engine No. Year

Reduction gearing made at FLUSHING by Kon. Mij. "de Schelde" Gear No. 6556 Year 1963

Type of engine with which gearing is to be used steam turbines State if for Class 1 or 2 ice strengthening

The following particulars are to be given as fully and clearly as possible. Wording not applicable should be cancelled by a black line.

Description of gearing, including reversing arrangements and clutches, if any, and No. of sets (state if ball or roller bearings)

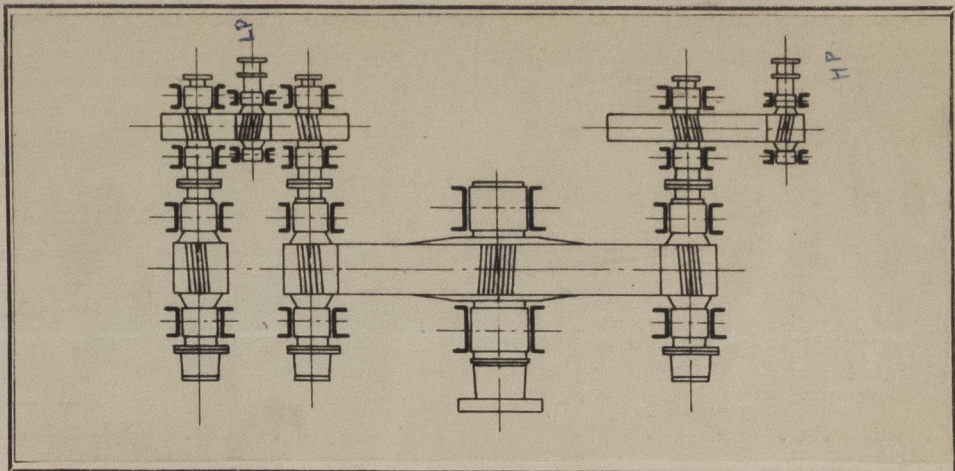
Double reduction single helical, tandem type with L.P. part dual tandem gearing

If single helical, what is the position of the gear thrust bearing? Primary pinions and primary wheels at forward end.

Helix angle, primary HP 12° LP 11° secondary 4° 30°

Type of involute tooth form pressure angle 15° "Maag" principle Approved maximum total S.H.P. 22500 at 145 R.P.M. of main wheel

DIAGRAMMATIC SKETCH SHOWING ARRANGEMENTS OF GEARING



PINIONS

Maximum S.H.P. to be delivered to primary pinions ...  
Revolutions per minute ...  
Diameter of pitch circle, inches/mm. ...  
No. of teeth ...  
Total width of face, parallel to axis, inches/mm. ...  
Width of gap, inches/mm. ...  
Diameter of shaft at bearings, inches/mm. ...  
No. of bearings ...  
Span of bearing centres, inches/mm. ...

PRIMARY			SECONDARY		
HP	MP	LP	HP	MP	LP
8440 ✓		14060 ✓			
7430 ✓		3000 ✓	1034		1320
240,250 ✓		390,423 ✓	451,392 ✓		388,197 ✓
47 ✓		73 ✓	50 ✓		43 ✓
230 ✓		230 ✓	450 ✓		450 ✓
-		-	-		-
149,70 with ✓		184,64 with ✓	319,66 - with 220 mm. -		319.66
80 mm. central hole		100 mm. central hole	central hole		2x2
2		2	2		
510		510	990		990
heat treatment 1 hour at 850° C, furnace cooled, subsequently raised to 600° C and air cooled, case hardened and stress relieved.					
EN 36 C		EN 36 C	EN 36 C		EN 36 C
93.5 - 103		91.9 - 99	84.3 - 94.8		88.9 - 95.7

QUILL SHAFTS

Diameter, inches/mm. ...  
Material, state nominal composition ...  
Tensile strength, tons per sq. in./kg. per sq. mm. ...

		150		136
		134 Cr. Ni. Mo 6		
		98.1		98.1
		fixed		fixed
		S.M. steel		
		52		52
		-		-
		-		-

FLEXIBLE COUPLINGS

Type of coupling ...  
Material, driving member ...  
Tensile strength, tons per sq. in./kg. per sq. mm. ...  
Material, driven member ...  
Tensile strength, tons per sq. in./kg. per sq. mm. ...

Do couplings permit axial float of pinions? Have primary pinions been dynamically balanced? Have secondary pinions been dynamically or statically balanced?

WHEELS

Revolutions per minute ...  
Diameter of pitch circle, inches/mm. ...  
No. of teeth ...

PRIMARY			MAIN
HP	MP	LP	
			112 ✓
1574,404 ✓	-	887,812 ✓	3511,827 ✓
308 ✓		166 ✓	389 ✓



WHEELS (continued)

	PRIMARY			MAIN
	HP	MP	LP	
Material of rims, state nominal composition ...	EN 28		EN 28	EN 28
Tensile strength, tons per sq. in./kg. per sq. mm. ...	130		117.6 - 120.2	135 - 140
Diameter of shaft at bearings, inches/mm. ...	219.26 ✓		219.26 ✓	589.54 ✓
Material of shaft ...	S.M. steel		S.M. steel	S.M. steel
Tensile strength, tons per sq. in./kg. per sq. mm. ...	51.3		48.7 - 52	48.4 - 49.6

Have wheels been statically balanced? primary dynamically Are wheel bodies of cast or welded construction? no  
main wheel: statically  
 Are wheel bodies connected to the shafts by bolts? H.P. prim+ main wheel Material of wheel bodies S.M. steel  
 Are rims shrunk on, or bolted to bodies, or attached by welding? HP prim + main & bolted  
LP prim: shrunk Are radial or axial dowels fitted? no  
 If shrunk, has the shrinkage allowance been checked and found as approved? yes How were the teeth cut? cut and ground  
 If hobbed, name and serial no. of hobbing machine - What post-hobbing process was applied? -  
 Name and serial no. of machine used for finishing process pinions and prim wheels Maag HSS 90 P If teeth are surface hardened, state  
main wheel Maag HSS 360  
 method Pinions: case hardened Were teeth cut under conditions of temperature control? yes  
 Is gearcase of cast or welded construction? yes If welded, has it been stress relieved? yes Have trammels or other  
 means been supplied for verifying that gearcase is free from distortion when secured in ship? yes Diameter of shaft  
 at thrust collar ✓ Has gearing been run light/under load in the shop and the tooth contact found satisfactory? yes  
 What is the backlash? (state whether measured circumferentially or normal to the teeth) HP prim. 0.44 - L.P. prim. upper 0.37 lower 0.35  
(normal to the teeth.)  
H.P. sec. 0.80 - L.P. sec. upper 0.93 lower 0.87 mm. If undulation records were taken, state maximum height from crest to trough  
 and wave length, pinions ✓  
wheels ✓  
 Maximum adjacent pitch error normal to teeth, if measured, pinions 0.002 mm.  
 wheels prim. 0.002 mm. main: 0.003 mm. Date of approval of plans 10-7-'62, 14-11-'62  
 If gearing is a duplicate of a previous case, state name of ship - N.V. Koninklijke Mij. "De Schelde"  
p. proc. *for Mas*  
 The foregoing description of reduction gearing is correct.

Manufacturer

GENERAL REMARKS

State if the gearing has been constructed under special survey in accordance with the Rules, approved plans and Secretary's letters. State quality of materials and workmanship. This report should be forwarded to the Head Office with the First Entry report on the machinery. When gearing is made at a Port other than the Port of installation, the Surveyors at the former should send this report to the Surveyors at the Port of installation as soon as possible after completion of the gearing. The latter should complete the Declaration below and send the report to the Head Office with their First Entry report on the machinery.

The gearing has been constructed under special survey in accordance with the Rules, approved plans and Secretary's letters. Materials found good and tested as required. Workmanship found good throughout. The gearing merits in my opinion the approval of the Committee.

Survey fee FLS 1202,-  
 Expenses 170,-  
 Turnover tax 157.17  
 Date when a/c rendered 24 SEP 1963

IDENTIFICATION MARKS

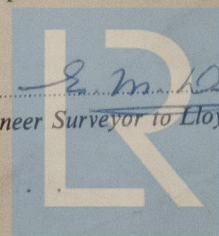
PRIMARY PINIONS H.P. LLOYD'S WIN. F. 6088-66090-3 J.H. 6-11-'62 A.v.B. 2-9-'63 - L.P. LLOYD'S WIN. F. 6088-66090-2 J.H. 6-11-'62 A.v.B. 2-9-'63  
 PRIMARY QUILL SHAFTS H.P. LLOYD'S WIN. 6088-66090-1 J.H. A.v.B. 2-9-'63 L.P. upper: LR WIN. 6088-66090-4 JH-A.v.B. 2-9-'63 L.P. lower: LR WIN. 6088-66090-5 JH-A.v.B. 2-9-'63  
 SECONDARY PINIONS -  
 SECONDARY QUILL SHAFTS H.P. LLOYD'S HNO. 91-GS A.v.B. 2-9-'63 LP upper: LLOYD'S HNO. 93-GS-A.v.B. 2-9-'63 LP lower: LLOYD'S HNO. 92-GS-A.v.B. 2-9-'63  
 FLEXIBLE COUPLINGS LLOYD'S VIN. 4183-A.W.H. A.v.B. 2-9-'63  
 PRIMARY WHEEL RIMS H.P.: LLOYD'S HNO. 443-GS-A.v.B. 2-9-'63 - L.P. upper: LR HNO. 481-G.S.-A.v.B. 2-9-'63 - L.P. lower: LR HNO. 131 GS-A.v.B. 2-9-'63  
 PRIMARY WHEEL SHAFTS HP; LLOYD'S HNO. 25-GS-A.v.B. 2-9-'63 - LP upper: LR HNO. 98-GS-A.v.B. 2-9-'63 LP lower: LR HNO. 246-GS-A.v.B. 2-9-'63  
 MAIN WHEEL RIM LLOYD'S HNO. 68-GS-A.v.B. 2-9-'63 MAIN WHEEL SHAFT LLOYD'S ROT. No. 1734 EMD-A.v.B. 2-9-'63

DECLARATION TO BE COMPLETED AND SIGNED BY THE SURVEYOR AT THE PORT OF INSTALLATION

The above reduction gearing has been fitted on board the SS Poolster at Rotterdam  
 in a proper manner and found satisfactory when tested on the (date) 16th until 19th June 1964 under full-power working conditions for 24 hrs. on 12,500 SHP and 2 hrs. on 22,500 SHP.  
 hours and when examined subsequently.

DATE OF COMMITTEE WEDNESDAY 23 DEC 1964  
 DECISION See Ref. 1

Engineer Surveyor to Lloyd's Register of Shipping



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Is a Report also sent on the Hull of the Ship? If not, state whether, and when, one will be sent?

MADE AND PRINTED IN ENGLAND

2m.656-Copyable Ink.