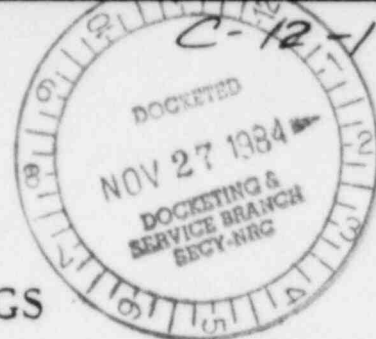


American Bureau of Shipping

REPORT ON CASTINGS OR FORGINGS



REPORT NO. ES 6290-365	ENGINE BUILDER Krupp Stahl AG. Schmiede- u. Bearbeitung Bochum, Germany	PORT OF ISSUE Essen, Germany
VESSEL OR HULL NO.	SHIPBUILDER	SERIAL NO.
STAMPED P.O. # A.B. # Name's # No. 3 Drawing # 12/20/84 date SHIPPED (DATE)	MANUFACTURED OR FINISHED BY Krupp Stahl AG. Schmiede- u. Bearbeitung Bochum, Germany PURCHASER Transamerica DeLaval, Inc. Engine and Compressor Division, Oakland, California, USA	MANUFACTURER'S NO. 101 965 PURCHASER'S ORDER NO. 14365 E-48
PROCESS OF MANUFACTURE forged		HEAT TREATMENT air-quenched and tempered, stress
		WEIGHT 6500 kg

DESCRIPTION OF ITEM IN FULL SIZE, DRAWING, NO. ETC.	PIECE NUMBER	HEAT NUMBER	Tensile Area 2 mm ²	Yield Point kg/mm ²	Tensile Strength kg/mm ²	% Elong. in 4d	% Reduction in Area	Hardness HRC
-1- eight-throw crankshaft, E-48 acc. to drawing no. 03-310-05- 10"L Material CX 45 L1191 (finish machined)	2698H	811167	126.6	363	695	24.0	50.9	205
	"	"	"	335	695	23.0	49.5	210
			295	570	22	35		

MATERIAL SPECIFICATION NO. **ASTM A 662-E REQUIREMENT**
and DeLaval # D 4774-4/81 min.

MANUFACTURER'S
CHEMICAL ANALYSIS

	C	Si	Mn	P	S	Cr	%
St # 811167	0.46	0.12	0.65	0.010	0.008	0.69	

(Electric steel vacuum degassed)

REMARKS AND PARTICULARS OF MAGNETIC PARTICLE OR RADIOGRAPHIC INSPECTION IF CARRIED OUT

**Magnetic particle test according to ASTM A 456-71 carried out, satisfactory.
For ultra-sonic inspection and grade of purity see manufacturer's certificates
attached to this report.**

1st Visit 19 Sept. 1985 Last Visit 17 Oct. 1985 No. of Visits = 3	The results of tests made on the above mentioned material have been found to be in accordance with the requirements of the Rules or applicable specifications.
Form Examined TOTAL	Date 17 October 1985 Surveyor K. Mahnhaupt

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American Bureau of Shipping

REPORT ON CASTINGS OR FORGINGS

REPORT NO. 83-ES 8527-1031	ENGINE BUILDER		PORT OF ISSUE Rej.							
VESSEL OR HULL NO.	SHIPBUILDER		SERIAL NO.							
STAMPED A.B. 43 No. Et/PC/ES #	MANUFACTURED OR FINISHED BY Krupp Stahl AG., Bochum, Germany		MANUFACTURER'S NO. 181 943							
	PURCHASER Delaval Turbine Inc., Oakland, Cal./U.S.A.		PURCHASER'S ORDER NO. 30 808							
SHIPPED (DATE)	PROCESS OF MANUFACTURE forged	HEAT TREATMENT air-quenched and tempered, stress relieved	WEIGHT 6500 kg							
DESCRIPTION OF ITEM IN FULL SIZE, DRAWING, NO. ETC.	PIECE NUMBER	HEAT NUMBER	Tensile Force Area	Yield Point mm ²	Tensile Strength mm ²	% Elong. in 4d	% Reduction in Area	Brinell HB 30		
-1- right-throw crankshaft acc. to drawing no. 11 363 Material CK 45 L.1191 (finish machined)	8163 H	821 487	126.6	395	702	25.0	50.9	210		
	8163 F	321 487	126.6	402	734	25.0	48.7	215		
						425	324.55			
							562 -			
							14430			
							110630			
							47018			
MATERIAL SPECIFICATION NO.		ASTM A 668-B		REQUIREMENT		min.				
MANUFACTURER'S CHEMICAL ANALYSIS						(Electric steel vacuum degassed)				
		Heat No.	C	Si	Mn	P	S	Cr	Al	%
		821 487	50	.05	.70	.006	.010	.63	.003	
REMARKS AND PARTICULARS OF MAGNETIC PARTICLE OR RADIOGRAPHIC INSPECTION IF CARRIED OUT										
Magnetic particle test according to ASTM A 454-71 satisfactory. For ultra-sonic inspection and grade of purity see manufacturer's certificates attached to this report.										
1st Visit 25 Nov. 82 Last Visit 4 Feb. 83 No. of Visits Four(4)		The results of tests made on the above mentioned material have been found to be in accordance with the requirements of the Rules or applicable specifications.								
Fees Expenses TOTAL		Date 4 February 1983		Surveyor P. J. J. J.						

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American Bureau of Shipping

REPORT ON CASTINGS OR FORGINGS

REPORT NO. 83-ES 35280-1051		ENGINE BUILDER		PORT OF ISSUE Buenos Aires/Argentina					
VESSEL OR HULL NO.		SHIP BUILDER		SERIAL NO.					
STAMPED A.B. 4 3 No. Ht/PC/ES 4		MANUFACTURED OR FINISHED BY Krupp Stahl AG., Bochum, Germany DeLaval Turbine Inc., Island, Cal./U.S.A.		MANUFACTURER'S NO. 181 942 PURCHASER'S ORDER NO. 30808					
SHIPPED (DATE)		PROCESS OF MANUFACTURE forged		HEAT TREATMENT air-quenched and tempered, stress relieved WEIGHT 6500 kg					
DESCRIPTION OF ITEM IN FULL SIZE, DRAWING, NO. ETC.	PIECE NUMBER	HEAT NUMBER	Test Piece Area	Yield Point offset	Tensile Strength in 4d	% Elong. in 4d	% Reduction in Area	Brinell hardness HB 30	
-1- eight-throw crankshaft acc. to drwg. no. 11 363 Material CX 45 2.1191 (finish machined)	8162 H 821 487	126.6	m2	2	695	25.0	54.1	205	
	8162 F 821 487	126.6		3	734	24.0	50.9	212	
MATERIAL SPECIFICATION NO. ASTM A 640-2 REQUIREMENT				min. 255 570 22 35					
MANUFACTURER'S CHEMICAL ANALYSIS									
Ht No. C				Si	Mn	P	S	Cr	Al %
821 487 .50 .05 .70 .006 .010 .63 .003									
(Electric steel vacuum degassed)									
REMARKS AND PARTICULARS OF MAGNETIC PARTICLE OR RADIOGRAPHIC INSPECTION IF CARRIED OUT									
Magnetic particle test according to ASTM A 456-71 satisfactory. For ultra-sonic inspection and grade offurity see manufacturer's certificates attached to this report.									
1st Visit 25 Nov. 82 Last Visit 4 Feb. 83 No. of Visits Four (4)		The results of tests made on the above mentioned material have been found to be in accordance with the requirements of the Rules or applicable specifications.							
Fees Examiner TOTAL		Date 4 February 1983		Surveyor B. J. L. L.					

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