



# Marine Design Appraisal Document

**Lloyd's Register EMEA**  
**London Plan Appraisal**  
**Engineering Systems**  
**71, Fenchurch Street**  
**London**  
**EC3M 4BS**

Date  
**20 April 2006**

Quote this reference on all future communications  
**LPA/DAPP/ENG/RJP/O-70306**

## MACHINERY DESIGN APPRAISAL DOCUMENT BETA MARINE LTD., 4 CYLINDER IN-LINE RECIPROCATING ENGINES

Valid until 19<sup>th</sup> April 2011

This Design Appraisal Document supersedes documents ENG I-17391 and PSG-27166, both issue 1.

1. The Document listed in paragraph 1 of the appendix have been examined for compliance with:  
 Part 5, Chapter 2 of the Rules and Regulations for the Classification of Ships  
 and will be assigned an appraisal status, as indicated, subject to the following conditions and comments.
2. Machinery Details:

Purpose	Main Propulsion and Auxiliary						
	BV 1505	BV 1903	BV 2203	BF 2803	BV3300	BV3300T	BV3800
Engine Builder's Designation	BV 1505	BV 1903	BV 2203	BF 2803	BV3300	BV3300T	BV3800
Maximum Continuous Rating, kW	27.95	31.63	36.78	45.61	50.7	61.9	57.3
Speed at MCR	3000	2800	2800	2800	2600	2600	2600
Maximum Firing Pressure, bar	75	75	75	75	90	110	58
bore, mm	78	80	87	87	98	98	100
stroke, mm	78.4	92.4	92.4	92.4	110	110	120

3. Shafting Material Details:

Manufacturing Method	solid forged
K <sub>1</sub> & K <sub>2</sub>	1.0
Grade of crankshaft material	SCM 435
UTS of crankshaft material	935 MPa

FINAL ACCEPTANCE OF ACTUAL ITEM(S) DEPEND(S) ON SATISFACTORY SURVEY AND TESTING

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4. Shaft sizes and stresses:

Model		BV 1505	BV 1903	BV 2203	BF 2803	BV3300	BV3300T	BV3800
Crankpin	solid diameter (mm)	40	47	47	47	53	53	53
	$\tau_a$	45	45	45	45	45	45	45
Journal	solid diameter (mm)	48	52	52	52	75	75	75
	$\tau_a$	26	33.2	33.2	33.2	15.9	15.9	15.9

5. Conditions of Approval:

- 5.1 Approval is subject to the remaining requirements for survey, testing and installation as required by the Rules stated above.
- 5.2 Where appropriate, engine component items are to be hydraulically tested in accordance with Part 5, Chapter 2, Section 9.1 of the Rules.

6. General Comments:

This Machinery General Design Appraisal Document is valid for a period of 5 years as stated at the head of the document. After that time, an application for renewal would be considered.

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 Engineering Systems  
 London Plan Approval

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