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Section 1



Cert. No. S-645  
File No. 686.40  
DnV Office:  
BERGEN

# DET NORSKE VERITAS

## TYPE APPROVAL CERTIFICATE

This is to certify that  
THE DESIGN OF  
Crane Shock Absorber, SWL 15 tonn.

### PRODUCT DESCRIPTION:

Combined hydraulic/gas filled cylinder with shock  
damping characteristics,  
See Appendix

### MANUFACTURED BY:

Ernst B. Johansen, a.s.  
Fjordgløttveien 25, N-3940 Heistad

### IS FOUND TO COMPLY WITH:

NPD "Regulations for Cranes on production installations"  
DnV "Rules for Certification Lifting Appliances" 1980  
General rules for pressure vessels TBK 1986 and BS 5500.

### APPLICATIONS/LIMITATIONS:

Damping of dynamic axial loads, in particular for use  
on offshore cranes.  
See Appendix

### APPROVAL CONDITIONS:

See Appendix

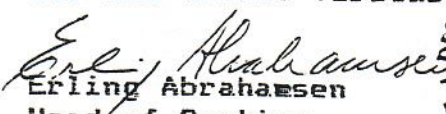
### TESTS CARRIED OUT:

Serial testing at each unit: Proof load 30 tonn  
Load test.  
Pressure test 442 bar and leak test.  
Non destructive examination.

THIS APPROVAL IS VALID UNTIL: 31st January 1993

for Det norske Veritas Classification A/S

Høvik, 09th January 1989

  
Erling Abrahamsen  
Head of Section

  
Nils M. Justad

Any significant changes in design or construction of the above item(s) may render this certificate invalid.

It is agreed that save as provided below Det norske Veritas, its subsidiaries, bodies, officers, directors, employees and agents shall have no liability for any loss, damage or expense allegedly caused directly or indirectly by their mistake or negligence, breach of warranty, or any other act, omission or error by them, including gross negligence or wilful misconduct by any such person with the exception of gross negligence or wilful misconduct by the governing bodies or senior executive officers of Det norske Veritas. This applies regardless of whether the loss, damage or expense has affected anyone with whom Det norske Veritas has a contract or a third party who has acted or relied on decisions made or information given by or on behalf of Det norske Veritas. However, if any person uses the services of Det norske Veritas or its subsidiaries or relies on any decision made or information given by or on behalf of them and in consequence suffers a loss, damage or expense proved to be due to their negligence, omission or default, then Det norske Veritas will pay by way of compensation to such person a sum representing his proved loss. In the event Det norske Veritas or its subsidiaries may be held liable in accordance with the sections above, the amount of compensation shall under no circumstances exceed the amount of the fee, if any, charged for that particular service, decision, advice or information. Under no circumstances whatsoever shall the individual or individuals who have personally caused the loss, damage or expense be held liable. In the event that any provision in this section shall be invalid under the law of any jurisdiction, the validity of the remaining provisions shall not in any way be affected.



**APPENDIX NO.: 2**

**APPROVAL CONDITIONS:**

(Continued)

Drawing No. 512-90B:

Bolts, Pos. 25, are to have a prestress of 70 % of the yield strength.

Bolts, Pos. 33, to be secured.

An approved welding procedure to be the basis for weld between pos. 6 and pos. 8.

Structural steels for heavy load carrying members, are to be delivered Charpy V-notch impact tested at a temperature TD (degree C) directed by the material thickness as given in table D1 in Veritas' "Rules for Certification of Lifting Appliances, 1980".

All heavy load carrying members to be delivered with material test certificate (3.1.8 according to DIN 50049).

. End of appendices .

for Det norske Veritas Classification A/S

Høvik, 09th January 1989

  
Erling Abrahamsen  
Head of Section



  
Nils M. Justad





**APPENDIX NO.: 1**

**PRODUCT DESCRIPTION:**

For identification to this approval the products are to be marked:

Manufacturer's name or trade mark.

Type designation and type certificate no.

Serial no./Prod year/Form CG-9 certificate no.

**APPLICATIONS/LIMITATIONS:**

The product's shock-damping capability may be considered in the design calculation for each application based on documented test measurements. The measurements should be carried out by full-scale testing under realistic and representative conditions.

**APPROVAL CONDITIONS:**

Max. static rated load 15 tonn

Max. working pressure (internal) 340 bar

Gas pretensioning pressure to be specified for each application.

"Bruksklasse" D according to NS 5514

Design temperature TD = -10 degr. C

Det norske Veritas Classification surveyor or a surveyor to an associated firm who have been authorized by the Society will survey fabrication and testing of each product as required. It is the manufacturers obligation to send for the Society's Surveyor when tests or inspections are to be conducted. The arrangement is to be in accordance with procedure 2A as stated in Certification Note No. 2.2.

The type approval apply for products which have been manufactured in accordance with the following drawings:  
495-16, 512-90B, 512-95A, 513-34A, 105-101, 494-60,  
495-18, 495-15, 513-33, 508-255, 508-252 and  
508-251.