

THE METALOCK INTERNATIONAL ASSOCIATION NEWS 2011



# METALOCK



# The Importance of the Metalock Service

The Metalock International Association plays an indispensable part in maintaining the best possible Metalock service to customers throughout Europe and the whole world. Shipping engineers and others with problems of machine fracture or breakage are urged to get in touch with their nearest Metalock company before making decisions as to replacement or scrapping.

The successful growth of the organization throughout the world has been achieved through the quality of work and emergency service provided. The Metalock process has its application not only in shipping but in every field of industry at one time or another. The work is executed only by specialist trained engineers who have built up a reputation for their skill and knowledge on the job. Prompt appearance of the engineer when an emergency arises is also the subject of constant customer appreciation.

Communication is a by-word in the Metalock organization; the local engineer is never alone should an unusual problem occur, technical advice is readily available day or night, essential when working out tight schedules to keep down-time to a minimum - it's these resources that do help to keep costs down.

Metalock is recognized throughout the shipping and industrial world, and by Lloyds and all the leading classification societies and insurance companies, as the ideal approach to problems involving metal fracture or breakage, and where a cold repair is desirable.

Metalock is a service as opposed to a product and the very essence of its service is the emergency value of the Metalock repair, a 24 hour service was quickly seen to be a normal expectation. Metalock Engineers were needed on the spot quickly and anywhere through the industrial world.

There are too many cases to mention where the Metalock Engineers have responded with promptitude in an emergency. They have occurred throughout the world, with many articles written and appearing in technical journals. It is encouraging indeed to observe the results which have been achieved in recent years in all our endeavours to improve the Metalock service.



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## Serving the Metalock Organisation

**A Worldwide Repair Organisation serving the Marine and Industrial Sectors.**

All Metalock companies who are members of the Metalock International Association are widely experienced in the cold mechanical repair to damaged castings using the Metalock cold repair process. They may also provide additional marine or industrial repairs and maintenance facilities. The facilities can vary from company to company and are continuously being expanded.

The following list, for easy recognition, illustrates the extent of services currently available from each member company.

- Metalock repairs
- In situ Machining
- Leak sealing (pipes, valves, fanges etc.)
- Dry-dock facilities
- ▲ Welding
- △ Electrical repairs
- ◆ Machine shop facilities
- ◇ Bearings re-metalled
- + Reconditioning of Diesel Engine Components
- ◀ Brush Plating



The full member's details can be found on our Website: – [www.metalockinternational.org](http://www.metalockinternational.org)

**REMEMBER – ONLY USE MEMBERS OF THE METALOCK INTERNATIONAL ASSOCIATION**



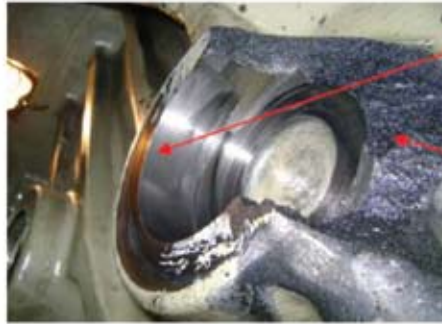
# Metalock Brazil carry out a Main Engine on board

The No.1 Engine suffered major damage to the Bearing Housing for the Intermediate Timing Gear.

Brazil repaired the damage using the Metalock cold repair technique. New cast iron inserts were used to replace the broken section and secured into position by the tried and tested Metalock procedure.



Gears removed exposing the damaged Housing.



Broken Sections.



The Flywheel was removed to enable two sections of the Engine to be cut out to access the damaged Housing.



The removed castings taken from the two apertures were retained for use upon completion of the repaired Housing.



The damaged Housing was prepared to accept the new pre machined insert.



# complicated repair on a Wartsila the MV Pertinacia.

Additional Strength would be achieved by the use of Steel Inserts and Steel Rings.

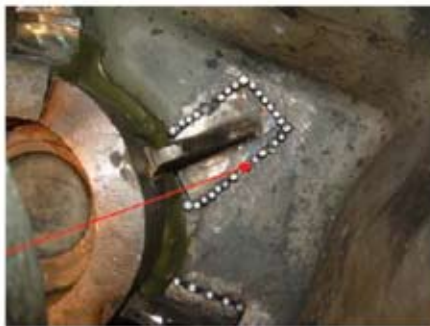
The original dimensions and alignment of the Gear Shaft Carrier surface would be restored by bushing in steel and in-situ machining. All repairs were carried out by 2 experienced Metallock Brasil Operatives.



The No.1 Main Engine.



Steel inserts were inlaid into the casing, becoming integral with the parent casting.



Insert in position with steel brackets.



Mounted portable boring bar for machining outer collar of insert and boss material.



The fitted Inserts O/D has been machined.



Steel Ring fitted prior to machining.



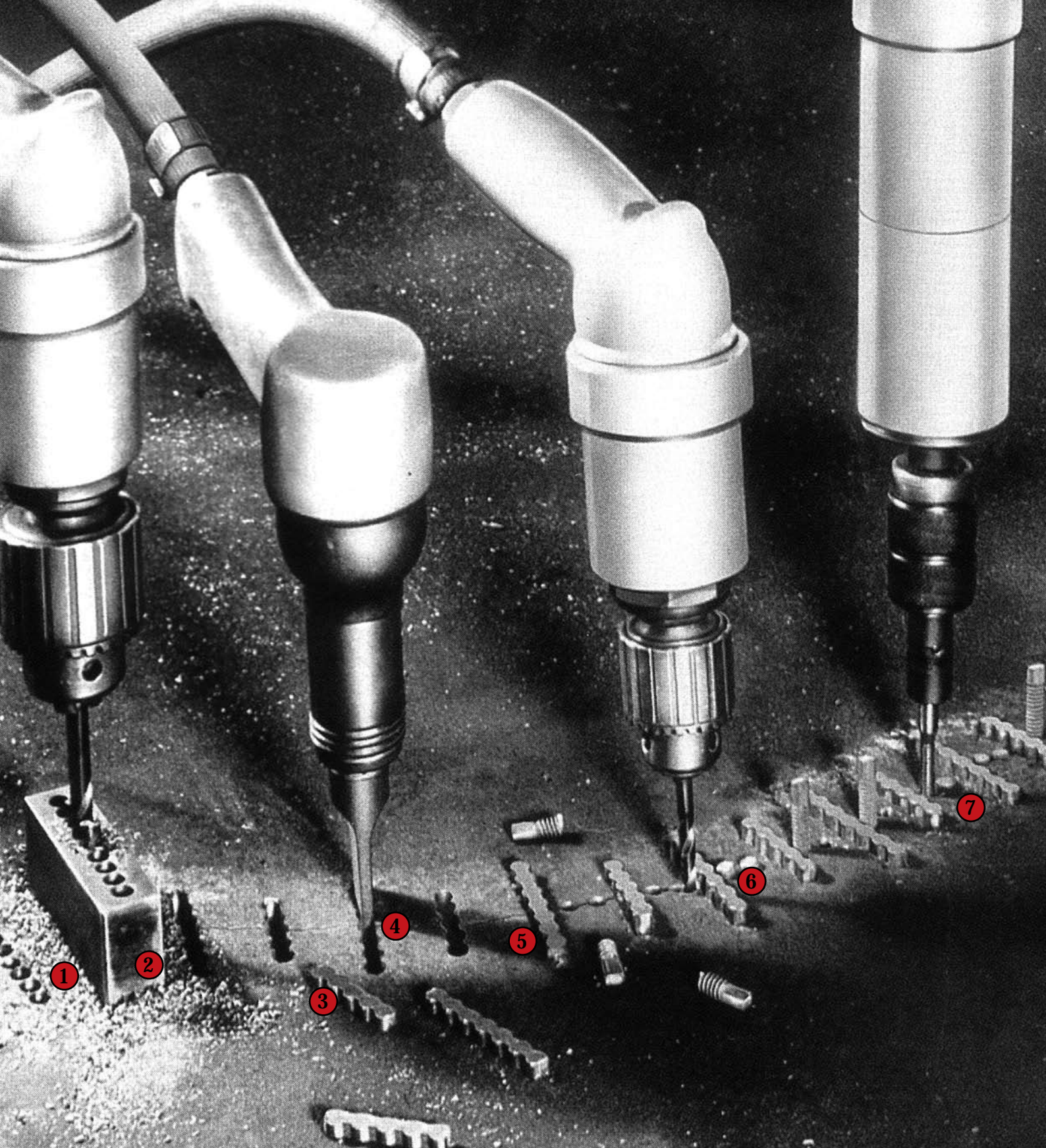
I/D Bush in Position.



Internal repair completed.



Access apertures closed and secured by the Metallock process and dressed to complete the repairs.



Breakages occur generally because of overloading, misuse of equipment, or flaws in the castings. Fractures are inclined to follow certain patterns depending on the type of equipment involved and the environment in which they are used. This repetition provides Metallock engineers with a wealth of information, on the one hand to be absolutely confident in the repair and also to complete the work within the minimum of time. This long experience also provides the engineer with many techniques, and special fixtures and tools to facilitate the repair have been developed over the years.

- (1) The fracture, after a survey and report has been presented to the customer, is positioned, realigned, and firmly held together by special fixtures and clamps.
- (2) By the use of special Jigs, groups of holes are drilled across the line of fracture to the tool depth of the casting.
- (3) The Metallock Key is a multi-dumbbell shaped section of highly ductile alloy, the size and length being selected to suit the type of fracture.
- (4) The holes are then joined by the use of pneumatic chisels to conform to the shape of the Metallock Keys.
- (5) Individual layers of Keys are inserted in the apertures and peened into a metal-to-metal condition, which becomes almost integral



# STEP BY STEP

with the parent metal. (6) Holes are then drilled along the line of the fracture, then tapped (7), and filled with studs (8), each stud biting into its predecessor, resulting in a pressure-tight joint and restoring a rigidity to the casting. (9) A Metallock stud is an important aspect of the Metallock process, bearing in mind that pressure repairs are often required. (10) The studs are then run down till the heads shear, the remaining rough metal being removed by pneumatic chisels. Finally the whole repair receives treatment from hand grinders (11) prior to its final coat of paint (12).

Some of the advantages of Metallock process:

- Dampens and absorbs compression stresses
- Provides a good 'expansion joint' for such castings as cylinder liners, diesel heads or any vessels subject to thermal stresses
- Distributes the tension load away from fatigue points
- Maintains relieved conditions of inherent internal stresses where rupture occurred
- Maintains alignment and original surfaces, since lack of heat produces no distortion
- The vast majority of repairs can be done in situ, with consequent savings in time with little or no dismantling.

# METALOCK ENGINEERING (QINGDAO) LTD - CHINA RENEW MAIN ENGINE FLYWHEEL TEETH

Scientific Research vessel, "XUE LONG" faced problems with her main engine flywheel teeth broken for many years. A repair service was offered without dismantling the flywheel and the procedure had the owners approval along with Classification.

## Procedure:

All the teeth were replaced with a new Teeth Ring and in order to avoid the Ring sliding during operation a 8pcs Stop Block was designed to hold the new teeth. It was also manufactured in 2 halves and once it was positioned, the Ring was welded together along the joint faces.

For the project to be successful the alignment between the new Ring and Flywheel was critical, so a portable Milling Machine was used with specially designed Milling Tools to mill down the old teeth, keeping the same centre line.



Milling work on the Flywheel.



New Teeth Ring secured to the Flywheel with Bolts.



Metallock Teeth Ring to Flywheel.



All Teeth were removed by drilling.



The two joints were welded together.



Master Keys were used to strengthen the repair.



The repair was completed in 20 days and tested with the Turning Gear to the complete satisfaction of the owners and classification.

# METALOCK OF AUSTRALIA PTY LTD

## REPAIR A POWER STATION OIL COOLER



The overall length of the Oil Cooler was 3 metres with a wall thickness of 20mm, the Flange had a diameter of 1050mm. The cracks were on the main body just below the Waterbox Flange. When in service the oil pressure is 100kPa, with an operating temperature of up to 60 deg C.



Damage/cracking was extensive requiring a new section to be manufactured and Metalocked into place. The pictures show the damaged Flange being cut off and set up to ensure fitting locations/bolt alignment are maintained.



Whilst the body is high grade cast iron, we fitted a steel flange for higher strength and material availability. This is one of the main benefits of Metalock process where dissimilar materials can be co-joined.

# METALOCK ITALY REPAIRS A SHIPS GENERATOR DURING ITS VOYAGE BETWEEN ITALY AND BELGIUM

During January, Metalock S.R.L. carried out a repair to a damaged entablature on-board a container carrier, sailing from the South of Italy to the North Sea.



The damage was to an inspection window on one of the generator engines of the vessel.



It was necessary to cut away part of the entablature and replace with a new insert made of carbon steel.

The sequence of photos shows the steps of the repair, drilling and cutting out the damaged area, inserting and stitching the new insert.

No final machining was necessary as the insert was pre-machined and precisely inserted by the help of a machined anchor plate.

The repair was completed within 7 days during the voyage.



# M.I.A. IN VARNA - BULGARIA

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This year the 59th conference was held at the beautiful Meliã Grand Hermitage Hotel in Varna Bulgaria, over 50 delegates and their partners attended the conference hosted by Varna Maritime Ltd.

Varna became a centre of the North Black Sea coast and a starting point for the design and building of the numerous resorts around it. Marine business developed - from fishing to the transfer of goods between the East and the West. Nowadays Varna is an industrial city - the third biggest one in Bulgaria after Sofia and Plovdiv.

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## OBITUARY



At the age of 88, after having suffered a stroke, Alfred Ken Hughes passed away on 8th September 2011. He had always been, from the bottom of his heart, a promoter of the METALOCK method and fought for this concern; he did all he could for the good co-operation among the METALOCK members.

Ken had been a METALOCK member almost from the beginning; later on he worked as a C.O.M. and as President, for many years he had been the Company Secretary until 2010. The range of what he did for the M.I.A. is hardly imaginable. METALOCK was his life!

Permanently Ken – together with other members – was researching on improvements for the repair of METALOCK tools and keys. The end of the last millennium saw an important breakthrough: At the AGM 2001 in Panamá, M.I.A. presented the METALOCK keys which had a chemical composition for heat-, oxidation- and corrosion resistance with a maximum strength and which were soft enough to be caulked.

Ken had not been merely a business man looking for the earning of money, but, very humanly, he supported those members who were not able to pay the full amount by reducing the annual fees. We owe him our full recognition for this. Ken, we thank you for all the outstanding services you provided! And we bow in deference and deeply felt mourning to a man like you whose bereavement we lament. Ken, you had been a pillar of the M.I.A.! We shall honour your legacy by constantly working on the assignment to guarantee the future strength and efficiency of the METALOCK Group.

Ken, finally I am going to allow myself some personal words: You always had been my mentor in finding the right way how to co-ordinate and guide the requirements of the individual METALOCK members. I shall continue working for the M.I.A. in your spirit!

Dietmar von der Fecht

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## COUNCIL OF MANAGEMENT

Elections were carried out at the Annual General Meeting for 2 new Council Members.

**PRESIDENT:**

Mr. Rene Escalera (Bolivia)

**DIRECTOR:**

Mr. Dietmar von der Fecht (Germany)

**VICE-PRESIDENT:**

Mr. Andrey Melnik (Russia)

**SECRETARY:**

Mr. David Fowler (Great Britain)

**COUNCILLORS:**

Mr. Enrique Baeza (Ecuador) Mr. Dario Patrino (Italy)



**Remember - only use members of the Metalock International Association ASK FOR A COPY OF THEIR M.I.A. CHARTER**

The Metalock International Association has a new address see back page for details

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IF YOU REQUIRE ANY INFORMATION ON METALOCK AND THE ASSOCIATION  
PLEASE NOTE OUR NEW ADDRESS:

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