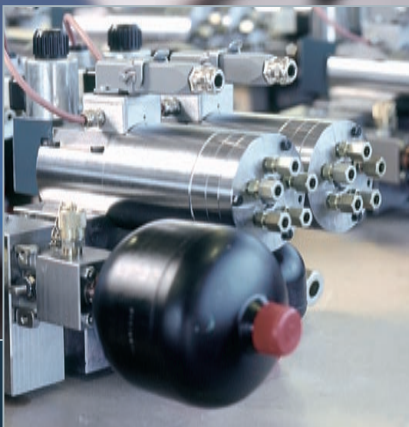
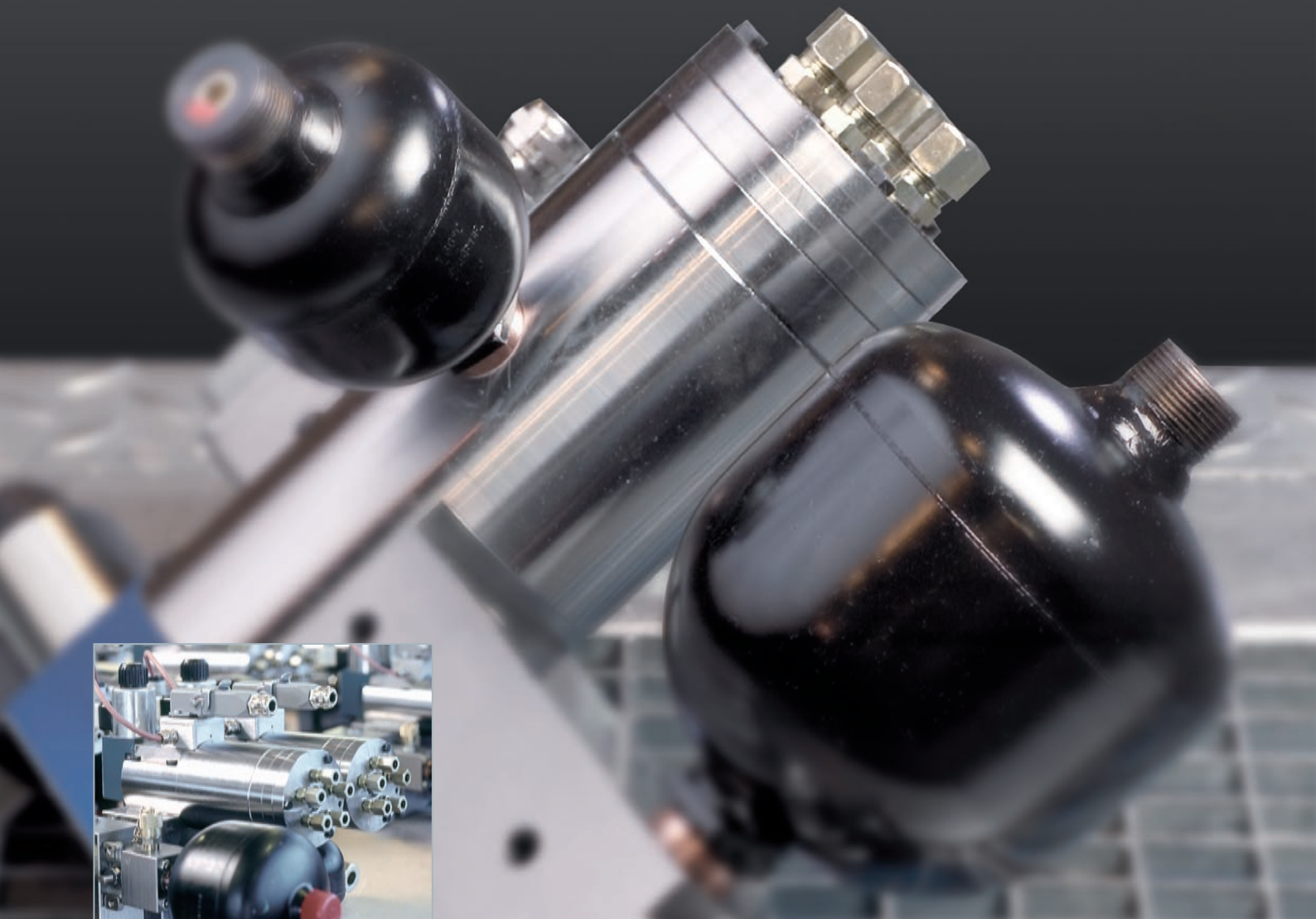


# Alpha Lubricator

Alpha Adaptive Cylinder Oil Control (Alpha ACC)



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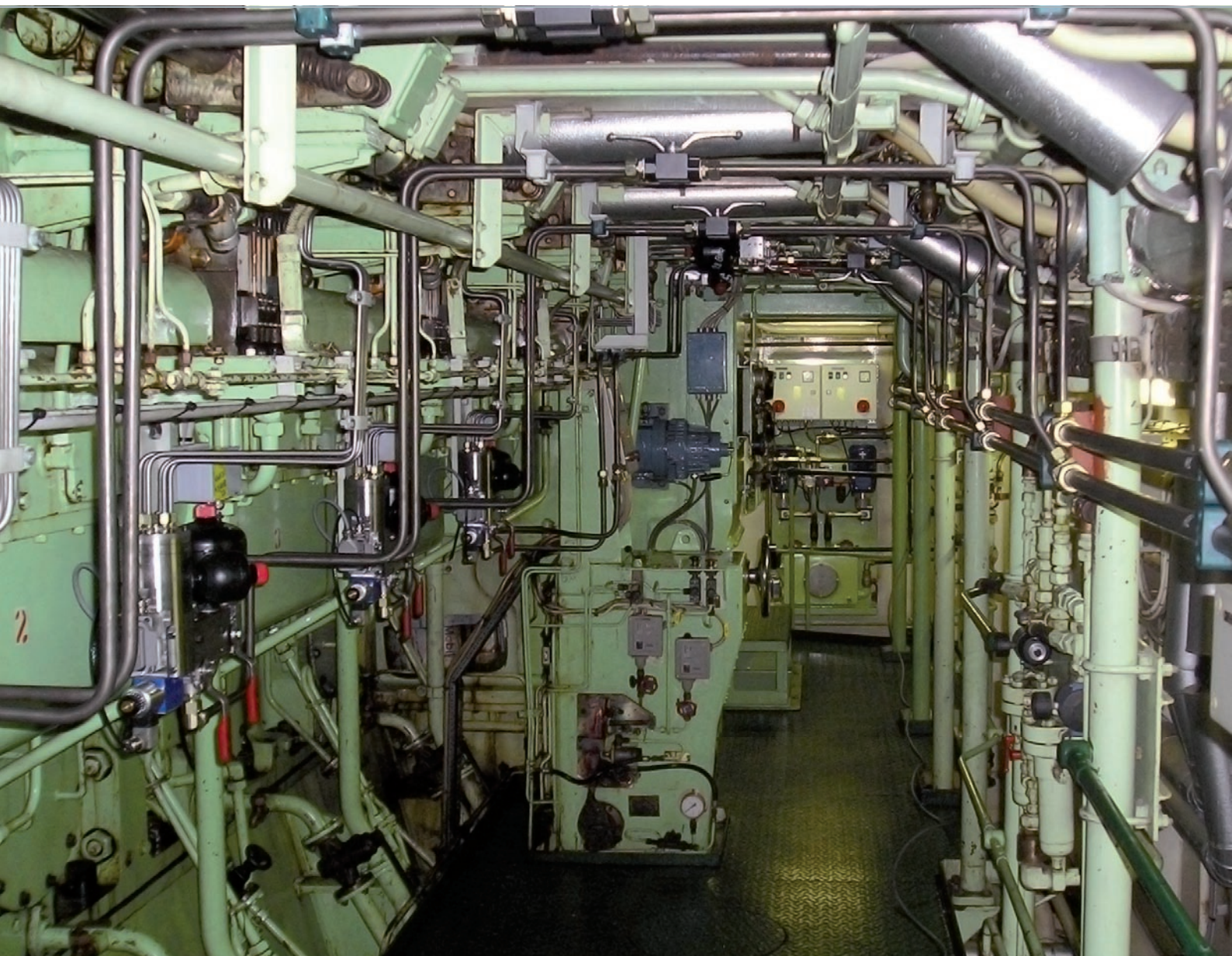
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# Alpha Adaptive Cylinder Oil Control (Alpha ACC)

## Alpha Adaptive Cylinder Oil Control (Alpha ACC)

The Alpha ACC is based on an algorithm controlling the cylinder oil dosage proportional to the sulphur content in the fuel.

To explore the potential savings with the Alpha ACC, a large-scale testing programme was initiated on MAN Diesel's MC and MC-C engines in service for a number of owners.

Results were very good, especially with respect to:

- Cylinder oil
- Particle emissions
- Combustion chamber wear

The outcome of the tests shows substantial annual savings and the Alpha Lubricator System with the Alpha ACC has a payback period of less than two years on most types of MC/MC-C engines. The Alpha ACC can be implemented on all MC/MC-C engines.

## The Principle of the Alpha ACC

The cylinder oil amount is controlled according to the amount of sulphur entering the cylinder with the fuel. Two criteria determine the control:

- The cylinder oil dosage must be proportional to the sulphur percentage in the fuel
- The cylinder oil dosage must be proportional to the engine load, i.e. the amount of fuel entering the cylinders

Implementation of the above two criteria leads to an optimal cylinder oil dosage.

As the main element of cylinder liner wear is of a corrosive nature, the amount of neutralising alkaline components needed in the cylinder will therefore be proportional to the amount of sulphur – which generates sulphurous acids – entering the cylinders. A minimum cylinder oil dosage is also set in order to satisfy the other requirements of a lubricant, such as providing an adequate oil film and detergency properties.



*Insertion of non-return valves and T- piece (position 4) with end plug in existing lubricator piping*

# The Retrofit Money Saver

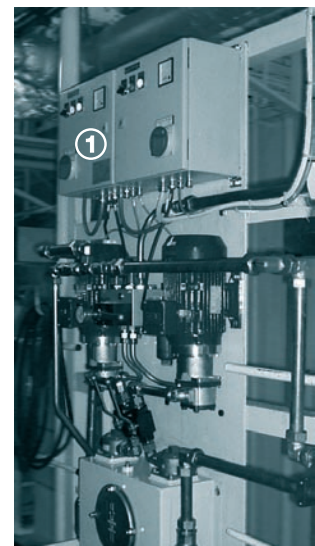
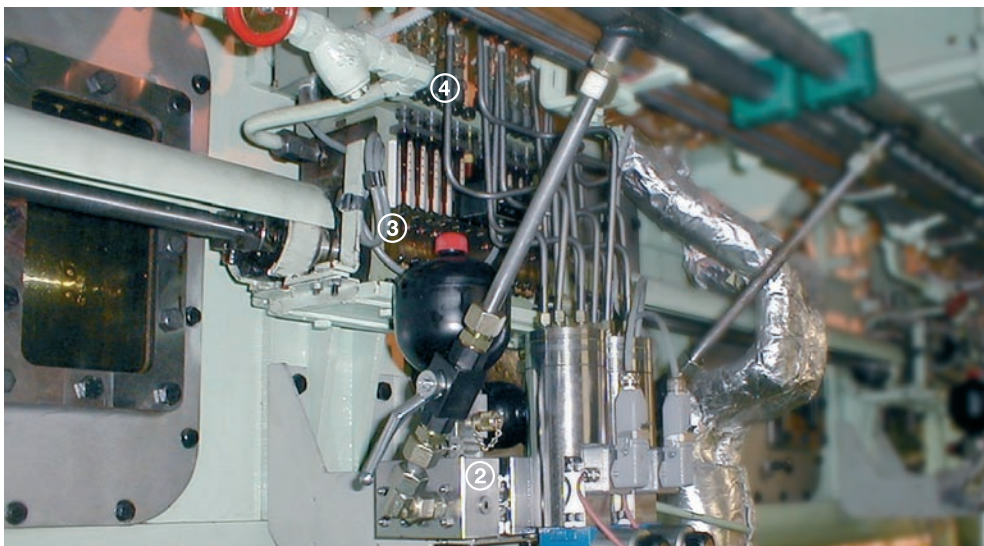
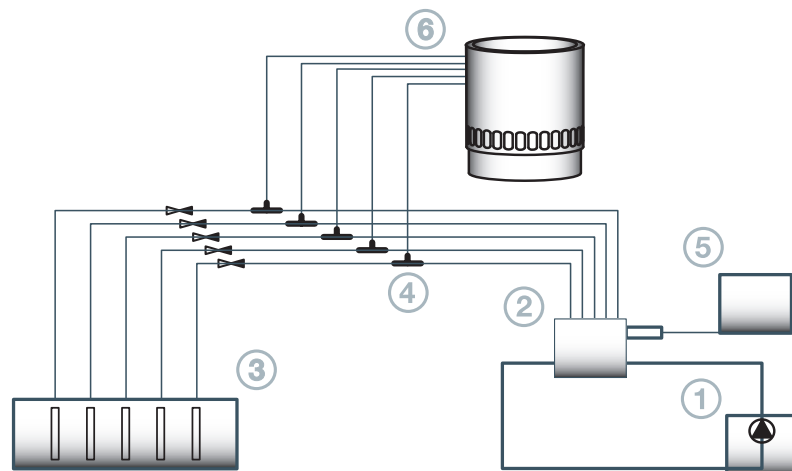
## The Retrofit Money Saver

As a retrofit on vessels in service the Alpha ACC gives:

- Significant savings on cylinder oil
- Lower particle emission levels
- Reduced combustion chamber wear

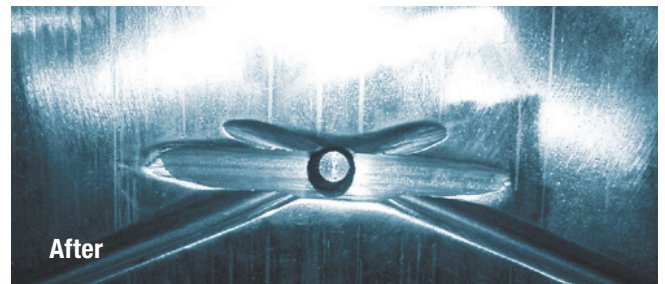
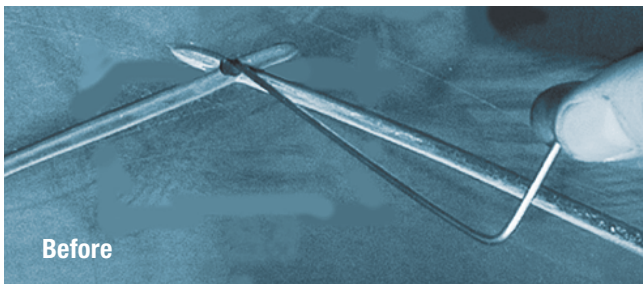
### Schematic diagram of the installation listing components 1-6:

- 1 Pump station
- 2 Alpha Lubricator
- 3 Existing Lubricator
- 4 T-piece
- 5 Alpha Control Unit
- 6 Non-return valves



# Alpha Lubricator System Retrofit for Ships in Service

## Oil quill modification



## Alpha Lubricator System Retrofit for Ships in Service

At sea:

- Mounting of Alpha Lubricators (position 2)
- Installation of pump station (position 1)
- Piping between Alpha Lubricators and pump station
- Cabling between Alpha Lubricators and Alpha Lubricator Control Unit (position 5)
- Piping from Alpha Lubricator up to T-piece (but not final connection to T-piece) (position 4)

In port/bunkering with the engine stopped:

- Cylinder liner modification (oil quill, larger holes and nonreturn valves). The modification can be done 'in-situ'. Some cylinder liners may already be prepared for the Alpha Lubricator System
- Installation of angle encoder and pick-up
- Insertion of non-return valves and T-pieces with end plugs in existing lubricator piping between existing lubricator and cylinder liner (see photograph–top left)
- Commissioning

## Installation

Alpha Lubricator retrofit installations are carried out according to the owner's choice. All projects are tailor-made based on the following packages delivered by MAN Diesel PrimeServ:

- Provision of parts
- Provision of parts and supervision
- Provision of parts, supervision and installation teams
- Turnkey projects