

## Victory 2 Work report 15.1.2025



**CUSTOMER:** Victory Cruise lines  
**VESSEL:** Victory 2  
**MAIN ENGINE:** CATERPILLAR 3516 B  
**ENGINE LOCATION:** STDB  
**Engine serial no:** 9AN00185  
**Engine hours:**

MDF was ordered to replace the engine block and crankshaft due to damage from cylinder 13. Connecting rod bearing was damaged and connecting rod comes out of the engine block, causing a fire in the engine room

## Summary Scope of Work (SOW):

The Ocean Navigator suffered an engine failure that led to an engine room fire, damaging the adjacent engines and other components. The failure was the #13 cylinder slung a rod through the side of the block. The damaged block and crank shaft are not repairable or usable. Due to the location within the vessel, the engine must be removed and installed in pieces and reassembled on location. The work will take place in 2 phase with the Phase 1 being disassembly and removal of numerous components, and Phase 2 approximately 2 months later to install all the new components and equipment. The disassembly will be performed in a methodical manner to try and find the root cause of the failure and may be witnessed by NTSB and USCG





## Work report block and crankshaft replacement

Work performed September 2<sup>nd</sup> -14<sup>th</sup> 2024 in Portland Maine

### Cylinder heads:

Cylinder heads were removed from the engine. Cylinder heads were inspected on board. All cylinder heads were visually good condition . No serious marks of damage.

it was agreed that all cylinder heads will be replaced with factory recon ones

Following components were inspected:

- push rods
- rocker arms ( not measured )
- valve lifters
- bridges

### Pistons and piston pins:

All the pistons were dismantled. Cylinders 13 and 14 totally destroyed



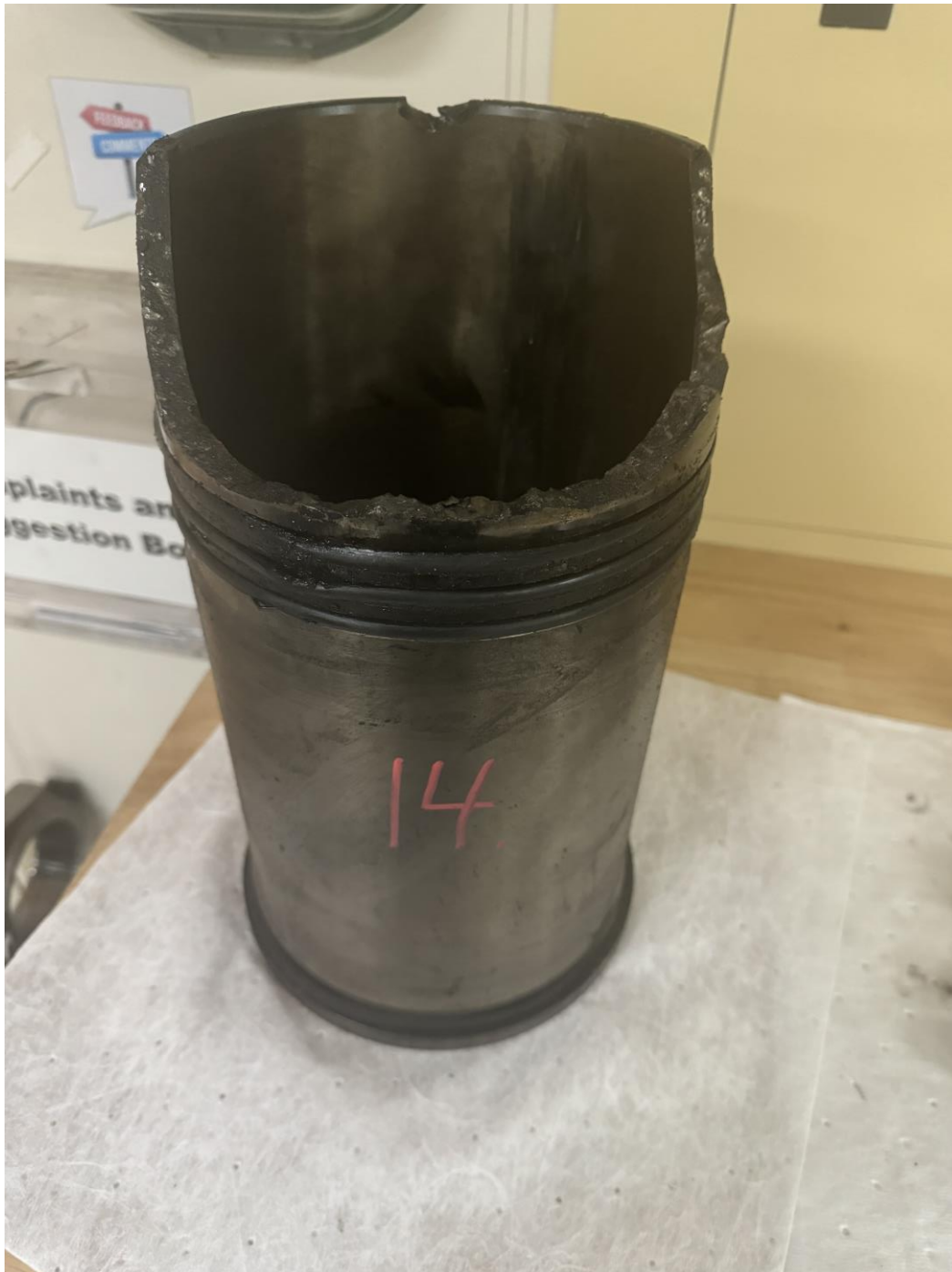
## Cylinder liners:

All liners were pulled out. Except no 13 which was badly stuck.

Cylinders 13 and 14 were totally damaged but all other cylinders were in normal condition

The water side of the liners were in good condition , but cylinder side you can see marks of wearing.

Agreed that all new cylinder packs to be ordered



## Connecting rod:

All connecting rods were removed and big end bearings were inspected. Really bad bearings were found. It is common for a high RPM engine to have cavitation marks on the bearings, but these were really bad conditions All of them.

Our opinion is that broken bearing causes failure. There were also a lot of white metal particles on the other crankshaft journals. Removed from the bearings.





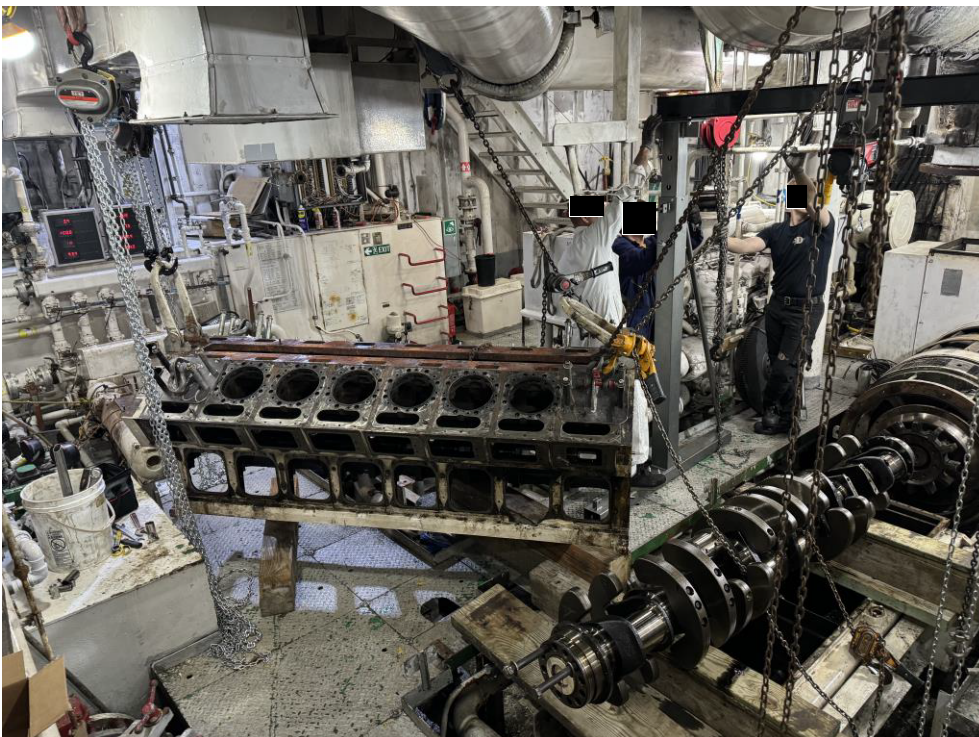
## Cylinder block:

The cylinder block was lifted up.

Total 4. lifting points and 4pcs 5T chain hoists.

Removed all necessary roof plates from engine room.

All needed pipes, hoses and wires was dismantled before block was lifted up





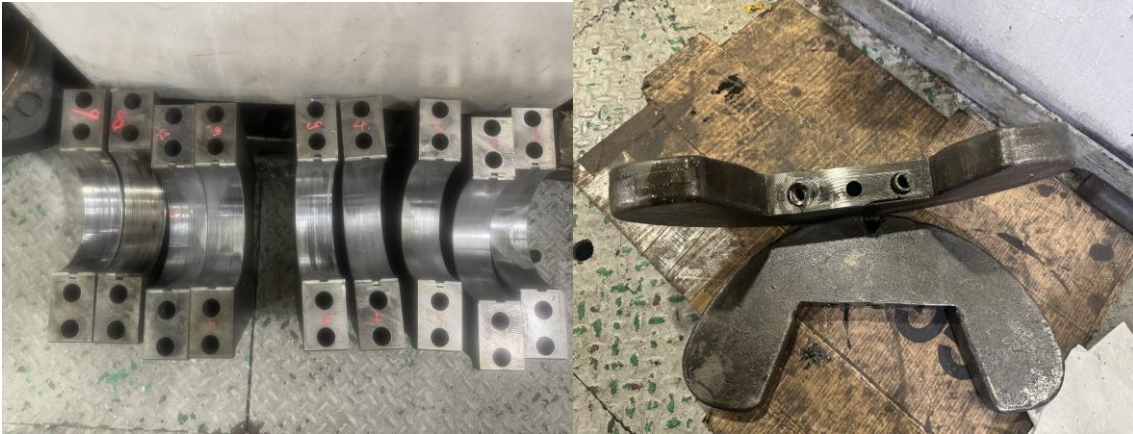
## Crankshaft:

All main bearing caps were opened.

Crankshaft was dismantled and all bearings were inspected. Bearing no 8 was in the worst condition.

Counterweights of connecting rod 13 and 14 had broken from their bolts and found from the oil pan

Both cranks shaft gears were removed. Gears were cleaned and inspected. Ok







COUNTERWEIGHT, BEARINGS AND DAMAGED SHAFT

### **Wiring harnesses and sensors:**

LH side sensors need to replace

Main wiring harness and exhaust temperature harness was damaged in a fire and need to replace





## **ECM :**

ECM were damaged and agreed that MDF will arrange a new one.

## **Injectors :**

Removed injectors for the engine . Visual inspected injectors ,  
No 14 were broken



BROKEN FUEL INJECTOR Cyl 14.

## **Camshaft:**

All the covers were removed and camshafts were visually inspected. The SB and PS side camshafts were removed. Both cams were in good condition

## **After coolers:**

Removed both aftercoolers. Coolers were oily and recommend to clean them by locally or replace new ones

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## **Turbo chargers:**

Removed turbo cartridges, exhaust and compressor side and hole turbo manifold.

Turbo cartridges recommended to replace for REMAN

## **Pumps:**

It was agreed that oil pump to replace for REMAN  
Fresh water and seawater pumps were visually inspected. Looks ok  
The fuel transfer pump was also inspected and looks ok

## **Front housing:**

The front housing was removed, housing and front gears were visually inspected ok.

## **Rear Housing**

The Rear housing was removed, housing and gears were visually inspected  
Bearings for idle gear was not so good condition and recommend changing



## **Oil pan:**

The oil pan was cleaned and inspected  
There were some hitting marks inside the oil pan .  
Measured that it is still in tolerances.

## **Oil cooler:**

Removed all oil lines from cooler to engine.  
It was agreed that oil cooler to replace for REMAN



### **Vibration dampers:**

Removed damper from the engine. All the bolts were stuck, and one went broke when opened. Agreed that all new bolts will come and damper to be overhauled locally



### **Flywheel:**

Removed and visually inspected . OK

## Flexible coupling:

Removed flexible coupling

Inspection of condition of coupling showed old and agreed that it will change for new ones



The work was done by:



Marine Diesel Finland Oy



Technical Director