Optimized Propulsion Efficiency with Cylinder Bypass Valve (CBV)

Operation of Controllable Pitch Propeller (CPP) in Fixed Pitch Propeller (FPP) mode

Go slow and save fast – even faster with increasing fuel oil prices

In general, turbocharged medium-speed diesel engines operate particularly economically in the upper power range. This is exploited by designing the engines accordingly.

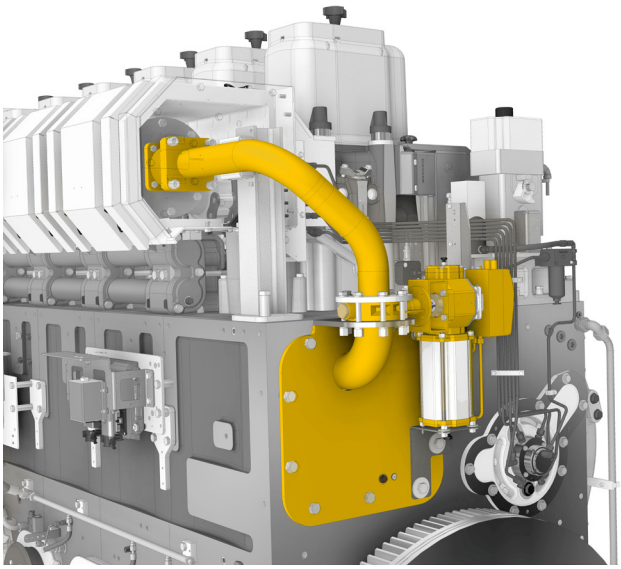
But the requirements on the load profile have changed due to slow steaming*. In case of standard equipped engines, the efficiency is lower at reduced power with variable speed.

Installing a CBV allows the engine to run at variable speed without a loss of efficiency.

For vessels with CPP this means the engine can be operated in a mode similar to a FPP application.

Instead of operating on constant speed, the engine speed is reduced by a defined percentage, or the engine is operated in an extended combinator mode. This reduces the required power whereas the ship velocity remains.

This results in a significant **reduction of fuel oil consumption of up to 20 %.**



Mounted CBV

*reduced cruising speed

Benefits with Retrofit of CBV to achieve variable speed operation in CPP assets

Timetable designed for cruising speed in the area of slow steaming

- Up to 20 % less fuel consumption
- Improved Carbon Intensity Indicator rating
- Lower harbor fees and port dues
- Government aid or subsidies

Higher boost pressure	Reduced engine vibration in part load
Improves surge margin	Engine does not stall in the lower speed range
Reduced exhaust gas temperatures	Reduced wear of turbocharger components

Key Requirements:

- CPP (Controllable Pitch Propeller)
- Constant pressure charged engine
- Shaft generator capable of variable engine speed*

Compatibility:

- Feasible for engines with aMACS, MACS, LESS
- No impact on existing systems:
  - Wastegate
  - Flexible Camshaft Technology (FCT)

*retrofit of frequency converter may be necessary

The CBV solution is available for following engines:

Engine	Number of Cylinders					
	6	7	8	9	12	16
M 20 C	✓		✓	✓		
M 25 E	✓		✓	✓		
M 32 C/E	✓		✓	✓		
M 43 C	✓	✓	✓	✓	✓	✓

Are you interested in Optimized Propulsion Efficiency or need further information?

Please contact your dealer or the Parts Product Solutions Team directly at:
Parts_Product_Solutions@cat.com

Caterpillar Motoren GmbH & Co. KG
Falckensteiner Str. 2
24159 Kiel/Germany

Phone: +49 431 3995 01
Telefax: +49 431 3995 2193

For more information please visit our website:
cat.com/marine

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