

YANMAR SERVICE NEWS

Title	Evaluation of Heavy Fuel Oil CCAI and How to Obtain CCAI Value	No.:02-2-G-12-037 –N/O Date: Dec. 2002
Eng. Model	All engine models	Applications
		Engine Nos.

Starting failure and faulty combustion have been caused by the use of low-grade heavy fuel oils. CCAI is a convenient index to know the ignitability of heavy fuel oils. Use CCAI for controlling your fuel oils.

1. Outline

Use HFO with the CCAI, (an ignitability index), below 850 as a standard. (Please note that the said value was estimated from the past operation data and that the value can vary depending on the future fuel oil quality.) The use of HFO with CCAI exceeding 850 will cause faulty combustion and aggravate exhaust color. If such use is inevitable, raise the intake air temperature. This will improve combustion to an extent. However, raise the intake air temperature carefully in relation with the exhaust temperature, since this will affect the exhaust temperature and other engine performance.”

What is CCAI?

CCAI stands for **C**alculation **C**arbon **A**romaticity **I**ndex, which shows an ignitability index.

The index, in consideration of the relation between aromatic compound content in fuel oil and the ignitability is used to obtain the aromaticity degree in relation with the fuel oil properties. The larger CCAI value, causes inferior ignitability, thus would make delayed firing. In this case, the HFO direct starting is not possible and exhaust color is aggravated due to faulty combustion.

Refer to the next sheet for obtaining the CCAI value.

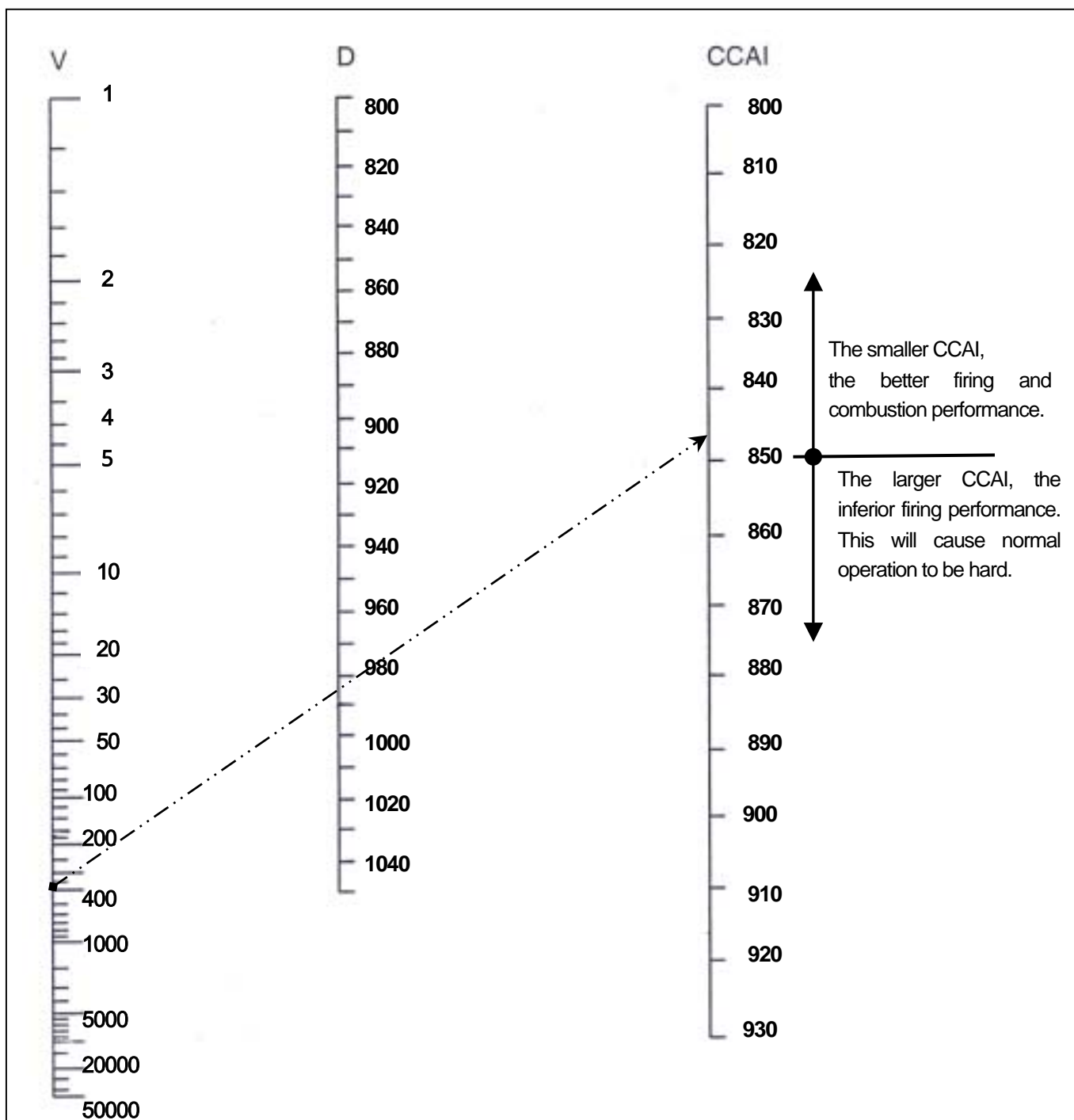
Note) Refer to our Service News, No.94 -3-G-07-003-L to obtain the CCAI of Marine Diesel Oil.

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Calculation of CCAI

$$\text{CCAI} = D - 81 - 141 \log \log (V + 0.85)$$

D : Density kg/m^3 @ 15°C, V : Viscosity mm^2/s @ 50°C



[Example]

Obtaining CCAI of HFO with the viscosity of 380cSt @ 50°C and the density of 985 kg/m^3 @ 15°C from the table above:

Draw a line from the viscosity (V) 380cSt to the density (D) 985 and extend the line to CCAI column.

The fuel oil CCAI in the present example is 846.