

Technical Information Note 005

Remarks

X-DF's Dynamic Combustion Control

Subject

All WinGD dual fuel low speed engines

Date: July 2016

Our Reference: 21349/CCA029/005

Sheet: 1/1

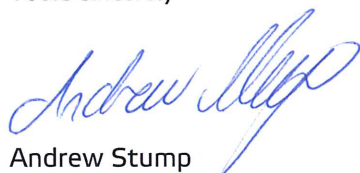
X-DF's "Dynamic Combustion Control" enhanced performance in all running conditions

WinGD has been improving the combustion characteristics for operation under harsh ambient conditions including but not limited to low methane numbers and tropical conditions. We have been successful in making positive gains and wish to confirm the situation and provide the attached technical presentation: X-DF's "*Dynamic Combustion Control*", explaining the changes we wish to introduce.

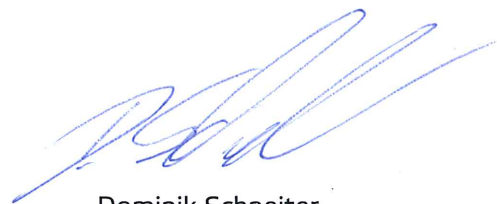
WinGD have implemented the Dynamic Combustion Control (DCC) technology. DCC successfully ensures full gas engine performance and emission levels while operating at tropical conditions and high load operations, and also in combination with low quality gases i.e. low methane number. We are very pleased with the performance that the Dynamic Combustion Control technology provides and we wish to explain the advantages of this to you. The objective of our Dynamic Combustion Control is to ensure optimum gas engine performance and NOX emissions at high engine loads. At engine loads approximately 85% and above, the effects of tropical conditions or low methane number are dynamically overcome by optimising the fuel ratio. The DCC technology only adjusts the liquid to gas fuel ratio when the operating conditions reach the maximum operating ranges specified for the engine, otherwise it is not operative. The DCC technology assists the Turbocharger to perform more effectively despite harsh ambient conditions. DCC benefits engine performance when poor methane quality is available and our research in this direction is ongoing.

We are confident that the Dynamic Combustion Control (DCC) technology provides security to the engines optimal performance under all load conditions, ambient conditions and various gas qualities while achieving Tier III emission levels without after treatment. WinGD will continue to develop and introduce improvements to the Dynamic Combustion Control technology in the future.

Yours sincerely



Andrew Stump
Vice President, Operations



Dominik Schneiter
Vice President, Research & Development