

CASE STUDY

July 2015



VISION Calibration and Data Acquisition Software used to develop first ever 200bhp diesel outboard motor

Until recently, petrol was the standard choice for most pleasure boat powerplants. More compact, lighter and more powerful than their traditional diesel counterparts, petrol engines were the ideal choice for small pleasure and light commercial applications where limited operating hour requirements and tighter cost constraints have traditionally driven powertrain selection.



“In most commercial situations, however, diesel technology is recognised as superior – more fuel efficient and robust, but heavy, complex and expensive,” explains Christer Flodman, technical manager

for Cimco Marine Diesel AB. “But a new generation of stronger, lighter and even more fuel efficient diesel engines has tipped the balance and is making diesel an option for the outboard engine in smaller marine applications.”

Cimco Marine Diesel has recently launched the world’s first high performance, high efficiency marine outboard diesel engine, called the OXE. The innovative gearbox belt design – originally developed for stern drives and inboard engine technology – eliminates the need for conventional complex bevel gears and transfer shafts to efficiently transfer the drive of a common-rail diesel engine. For this project Cimco has marinized a standard GM 2.0-litre turbo diesel engine by designing separate systems for seawater, heat exchangers, intercooler and oil cooler as well as mounting the entire powerplant horizontally. All service points are at the front of the engine, so maintenance and servicing can be performed on the water, whilst the addition of a dry sump system maintains consistent oil lubrication in all running conditions, allowing for rolling in heavy seas, plus tilting and trimming situations.



While the use of diesel outboard engines for light marine applications isn’t new, they aren’t commonplace either; they have historically been large and low power – the most popular being just 37bhp. The OXE is the world’s first 200bhp production diesel outboard motor, and a number of engine sizes are in development – both smaller and larger than 200bhp.

Throughout the OXE project Cimco Marine AB has relied on a tool chain supplied by Accurate Technologies (ATI) Sweden AB that included ATI VISION Calibration and Data Acquisition Software and Kvaser USBcan Pro and Memorator Pro Interfaces and data loggers for CAN analysis. The modular suite of hardware and software was used throughout the evaluation program. Marine engines undergo

similar test procedures as those in the automotive industry including dyno tests simulate different climatic conditions, plus cold start, emissions and numerous sea trials.

Notes Flodman: “All the products worked excellently together. Minimal feedback and support were required from ATI as the software, DAQ modules and Kvaser’s CAN interfaces and dataloggers were all extremely easy to set up. I had used these products before but the rest of the team hadn’t. They were impressed how intuitive VISION was to use. ATI provided us with a strong and efficient toolchain that let us focus on the product development, rather than spending valuable time solving test equipment issues.”

Cimco Marine Diesel AB was set up in 2012 to bring the OXE to commercial reality. However, development of the OXE technology has taken over six years, with component test – belt system, engine, gearbox, electrical system, fuel system and air intake etc. – over a period of three years to allow for rigorous sea trials. “What took the time,” recounts Flodman, “was packaging the system into a small, light form factor that would meeting the running conditions of commercial craft, which are much tougher than the pleasure market.”

VISION Software provided the advanced capabilities required by Cimco in their development of OXE-Diesel. “VISION’s functionality in calculating and correction of measurement parameters as moving average, absolute values saved Cimco a lot of post analysis work. Other important time saving VISION features are automatic saving and automatic conversion to .csv format. VISION’s stripchart recorder is a very powerful tool to visualize trends over time including the ability to scale and zoom a selection of recorded data items. Contributing to the ease of use is the extensive trigger functionality, a highly appreciated feature of the stripchart recorder settings. The log files from these recordings were the backbone of our analytical work. “In short, we would say that VISION is a very powerful tool in its expandability and adaptability to system configurations,” concluded Flodman.

To learn more about how ATI’s software, hardware and support solutions can deliver a successful outcome for your project please, click on www accuratetechnologies.com.