



ADVANCED

TEST & AUTOMATION

Systems and Software for a Complex World in Motion



Project Overview



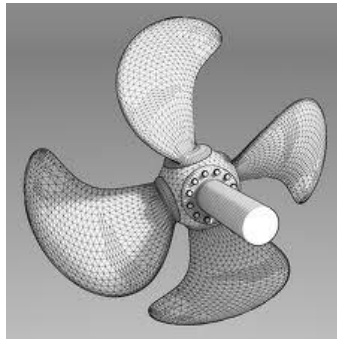
Marine Bearing

Performance and Durability Test Stand



Who We Worked With

- ATA Inc. was approached by a new client with a need to perform comprehensive testing on a series of Marine Bearing assemblies



- The client was a large global company specializing in the production of various marine bearing systems
- The client wanted a solution geared towards testing various models of blue water propeller shaft bearing assemblies, used in many different large ship applications
- In addition to yielding performance & durability data on a variety of existing designs, the solution had to be capable of testing newly designed models of similar size and layout



Tailored To Specific Needs

- After careful analysis of the different bearing systems to be tested, ATA proposed a simple and effective layout that would result in the most flexible setup for the client

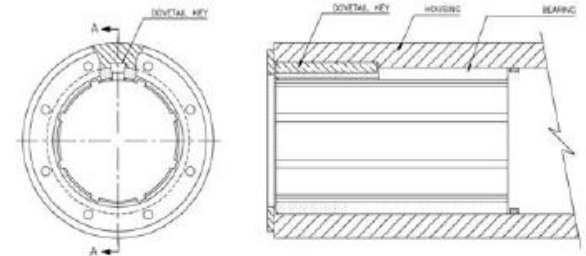


- Through this process ATA was able to develop a full understanding of the component behavior under different modes of operation
- ATA was able to propose an architecture to accomplish client's goals using proven methodology, with test procedures conforming to custom OEM specifications



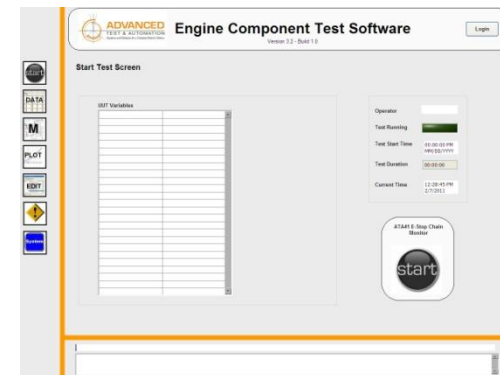
Key Design Elements

- The first step of the design process was sizing all major test bench components specifically to client's products requirements, such as:
 - selection of drive motor by analysis of torque vs. speed profiles
 - sizing of the inline torque sensor based on maximum torque
- The bearing assembly was supported via dual pillow block housings and a main driveshaft, allowing for easy part installation
- Design of a fully integrated load application system included the proper sizing of hydraulic cylinders used to apply the load
 - external loading was possible in both axial and radial layouts
 - inline load cells provided feedback on the load magnitude
- For technical info regarding the test bench, contact ATA Inc.



Productivity & Expandability

- The test stand was designed as a cost effective solution by using established and verified technologies, and maximizing the use of off-the-shelf components for easy replacement
- Built in software features such as PID control, combined with a high level of test script automation, managed to simplify the design engineer's tasks
- Multiple test sequences were preloaded on the test stand, which when combined with the automatic safety features of the machine, allowed the operator for more unsupervised control
- A standardized design approach resulted in lower cost and uncertainty for the client, better measurement accuracy and improved software capability





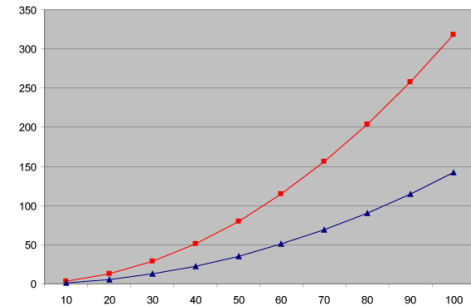
Superior Efficiency

- Quick unit under tests changeover times between tests, due to smart fixture and drive mechanism design that minimizes the total number of steps required to install a new unit
- Refined software features provide automatic test selection and execution based on detecting the appropriate trigger conditions, setpoint detection within a specified tolerance, speed ramping, etc.
- Onboard system diagnostics with automatic alarming parameters, which notify the operator of the current test execution status, or if any conditions have caused the test to be aborted
- Extremely low maintenance requirements by using carefully selected sub-components, such as sealed pillow blocks and bearings with temperature monitoring sensors



Making Sense Of The Data

- Automatic execution of preloaded test scripts allowed the client to retrieve test data from tests such as:
 - free-running torque under various steady-state speed setpoints
 - bearing assembly response under custom speed profiles
 - torque response at constant speed under axial and radial loading
- Flexibility on the data logging format and the sampling frequency through the programming interface, in order to simplify report layouts or integration into existing databases or analysis tools
- Real-time graphing features provided live feedback of any measured parameter, including a variable historical buffer for operator reference



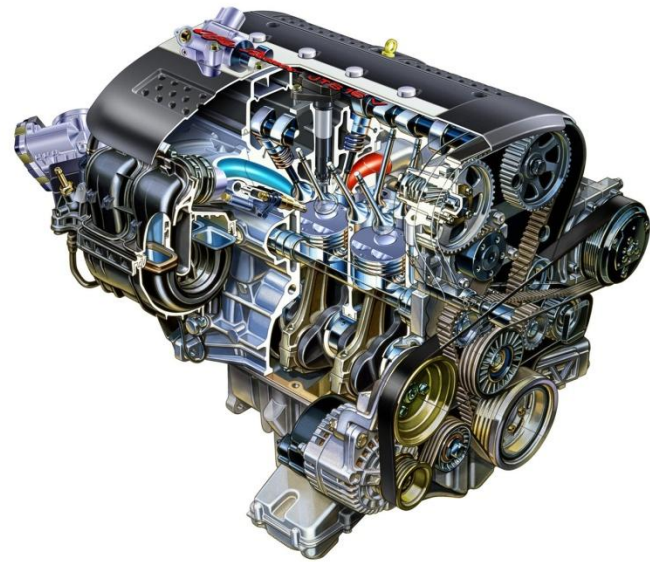
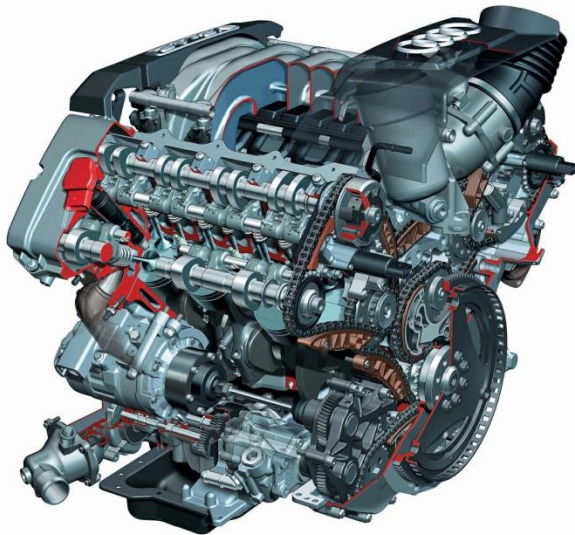


Project Milestones

- The project was delivered on-time and on-budget, and concluded with the notion that ATA will continue to support the client whenever difficulties during test stand operation, test script modification, or results analysis are encountered
- Upon project completion, all documentation needed for service and maintenance of the test stand was released to the client:
 - electrical, hydraulic and pneumatic drawings
 - mechanical drawings of custom fixtures and spare parts
 - comprehensive test stand and software manuals
- Proposal to full design time: 4 weeks
- Design to approval time: 2 weeks
- Build and commissioning time: 4 weeks
- On-site setup time: 1 week

Facts About ATA Inc.

- Certified Engineering Firm
- Specialized in Complex Rotating Components
- Formalized Project Management & Delivery Process
- Internal Design, Integration and Commissioning Team



ATA Inc.

Your Partner in Test

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