Propulsion System for Displacement Hull Vessels

American Traction Systems

Electric Propulsion Controls and Accessories

The Diesel Electric System consists of

Two Diesel Engines coupled with two Generators
Two Propulsion Motors
One Auxiliary Motor
Multiple Power Modules connected to a common DC Bus
One Shore Power Input Panel
Two EMC filters
One Master Control Module

The Bus maintains power flow between batteries, generators, propulsion motors, 115/230VAC distribution, 24VDC distribution, 12VDC distribution and shore supply interface

The system is equipped with a Master Control Interface for operation and service providing:

- **Connections to engines and all other devices using CANbus.**
- **NMEA 2000 Compatable**
- **Connections to the control console.**
- **Automatic, unattended engine starting to maintain battery charge.**
- **Diagnostic and programming display.**
- **Continuous data logging with download to computer.**

Features of the ATS Diesel-Electric Propulsion System

The Diesel Electric technology offers unprecedented fuel efficiency at any vessel speed.

This system allows one diesel engine/generator to operate two large propellers. The second engine/ generator provides redundancy and extra power when needed.

This eliminates light load or "wet stacking" conditions detrimental to diesel engines - ensuring extended engine life. It also cuts energy consumption at vessel speeds typical for inland water ways and long range cruising.

Perhaps the most intriguing is that our open architecture systems can readily utilize power from fuel cells, solar, wind, thermoelectric generators or any other alternative energy source as they become available allowing owners to take advantage of even higher efficiencies from future technologies.

The "hotel" power on board is provided by inverters fed by either the diesel engine/generators or a large battery bank.

Benefits of the ATS Diesel-Electric Propulsion System

Better fuel economy by decoupling the engine speed from the propeller speed which allows operation at the most efficient load point over a wide speed range.

Minimized pollution due to highly efficient operation of the diesel engine over a wide range.

Longer engine life because only one engine is operating under normal cruise speed conditions.

Redundancy of engine availability enhancing safety.

Total elimination of traditional generators, their controls and cooling systems.

Total elimination of gear boxe(s) between the engines and the propellers thereby avoiding hardware cost, maintenance and mechanical losses. Eliminates the tedious task of aligning the engine, gearbox and propeller shaft.

Elimination of mechanical shifting between forward and reverse. Instead, forward and reverse is quietly and gently performed by reversing the rotational direction of the electric propulsion motor.

Ability to operate the propellers at constant speed rather than operating the diesel engine(s) at fixed throttle. The disadvantage of the latter often causes undesirable vessel speed acceleration when moving off a wave top in a following sea thereby dangerously forcing the bow down into the wave ahead of the vessel.

Operating the propellers at constant speed by nature saves fuel because the physical load on the propellers decrease when moving "down hill" from a wave top. The control system instantly reacts and reduces diesel engine load and fuel consumption. Similar to a car operating in "cruise control mode" going down hill.