ON LAND AND WATER

Gibbs Technologies seeking to expand applications for amphibious vehicle designs

BY BILL SIURU

In the 1990s, Gibbs Technologies launched the Aquada amphibious car, a sporty three-seat convertible designed to be equally at home on the road or in the water. The vehicle was the brainchild of New Zealand entrepreneur Alan Gibbs, who founded his company in Auburn Hills, Mich., to develop his high speed amphibian (HSA) which integrates specific developments in suspension, water propulsion and wheel-retraction technology for vehicles of all sizes.

The Aquada is designed to travel at up to 100 mph on land and more than 30 mph on the water and in 2004, Virgin Group owner Richard Branson used an Aquada to set a new record for crossing the English Channel in an amphibious vehicle. Branson’s 1 hour 40 minute trip beat the previous record by more than four hours.

While the Aquada showcased Gibbs’ technology, there were some questions as to whether it would exist as a curiosity or actually have a commercial future. As an answer to that question, Gibbs Technologies has recently developed two amphibious trucks aimed at the transport, military and first responder markets.

The 30 ft. long Phibian is an amphibious truck that carries up to 15 people or 3000 lb. of cargo and has off-road capability. It is driven by twin water jets when on the water.

Transformation from land to water mode is done with the touch of a button and takes about 10 seconds, the company said. A specially designed hydraulic strut is used to lift the wheel and tire assembly and fold the wheels inward within the housing. The amphibian can sense when it is in water and will not allow wheel retraction on land.

Large quantities of water enter the water jet from beneath the vehicle through an intake fitted with a stone guard. An engine-driven impeller accelerates the flow, imparting axial and centrifugal energy to the water stream. Stator blades and a nozzle then converges the flow to produce a high-speed jet to propel the craft forward.
The 22 ft. long Humdinga from Gibbs Technologies is intended for light-duty patrol and rescue work, where it could eliminate the need for a separate boat, tow vehicle and trailer.

A steering nozzle, mounted on the back of the stator, is connected to the centrally-located steering wheel and uses the water jet to steer the amphibious vehicle. Steering at full lock, the vehicle can turn within its own length, the company said. The water jet can also be used for low-speed reversing.

The Phibian uses two six-cylinder, twin-turbo Steyr MO256H45 diesel engines rated 250 hp (which can be uprated to 300 hp) to power the twin jets. The smaller five-seat Humdinga is driven by a Range Rover 4.2 L supercharged gasoline engine that is mated to a six-speed ZF gearbox.

The single piece hull, made mostly of carbon fiber, is designed to be efficient aerodynamically on the road and hydrodynamically in the water, said the company. The hull provides a stable planing surface to skim over the surface of the water. There is a keel fin for directional stability. Spray rails and chines contain the spray on either side of the amphibian and out of the cockpit. In addition, chines and strakes provide grip when cornering for exceptional maneuverability, the company said.

While no production schedule has been finalized, Gibbs said it plans to offer both amphibious trucks as a base model that can be customized for customer requirements, including different powerplants. The company will also offer a full array of options that range from a fully enclosed stand-up cabin with a heater, air conditioner and chemical toilet to a radar, tailgate and winch.

Gibbs Technologies has also shown a prototype of the Quadski, an all-terrain vehicle (ATV) that incorporates HSA technology. Developed for applications such as first response and reconnaissance, the Quadski is designed to reach speeds up to 50 mph on both land and water. The engine and other component details have not yet been finalized. 

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