

UNLIMITED HYDROPLANE RACING

A hydroplane is a propeller driven racing boat which at full speed is almost airborne, touching the water only on the edges of its two pontoon-like sponsons and on the bottom half of its propeller. Three points contact the water, thus the term "three-point hydroplane."

An "unlimited" hydroplane is the largest, fastest class of such race boats. These weigh at least 5000 pounds, are 25 to 40 feet long and carry engines which are unlimited in cubic inches or horsepower.

The engines used in almost all of these "U-Hydros" are big 12-cylinder, V-type airplane engines most of which are surplus from W.W. II fighter planes. The Rolls Royce Merlins and the Allison's, for instance, were used in such famous fighters as the P51 Mustangs and the Mosquito fighter-bombers. The "Rolls" engines, although designed in England, were built under contract during the war by the Packard Motor Company in this country.

Naturally, when these engines are fitted into U-Hydro race boats they must first undergo several changes. For instance, in the Miss Bardahl, 1963-64 National Champion Unlimited Hydroplane from Seattle, Rolls engines are used and are changed as follows: First, the supercharger or blower is turned upside-down so that the carburetor sits on top of the front of the blower rather than on the bottom. The fighter planes using these engines had intake scoops on the bottom.

Secondly, the gearing and gear case for the plane's propeller are removed and a special gearbox manufactured especially for unlimited hydroplanes is installed. This gearbox steps up the revolutions-per-minute approximately 3 times so that when the engine is turning at a good racing speed of about 4000 RPM, the propeller is turning at 12,000.

Four thousand RPM is definitely not a normal speed for these engines, since they were originally designed for 2800 top RPM. But because of the internal modifications made by the crew, the engines turn faster and also develop about 1000-1500 more horsepower than their originally specified 2200.

The superchargers on the Rolls engines turn about 6 times as fast as the engine or 24,000 RPM at the engines 4000. The supercharger is a kind of turbine fan which forces the fuel/air mixture from the carburetor into the engine's combustion chambers.

As the unlimited hydroplane is operating at racing speeds, the boat's propeller - a relatively small 13 inches in diameter but with a pitch of up to 24 inches - throws a huge spray of water some 40 feet into the air and some 75 yards out behind. This is called the "roostertail" and must be considered part of the racing boat. The driver must watch out for other roostertails or run the chance of being "washed down". This wall of water is well capable of drowning out an engine, especially if that engine is open and not covered by a cowling.

The propeller also tends to throw the back of the boat to the right at high speeds because of what is termed "propeller torque." To compensate for this a "trim tab" is used on the boat's tail, that is, the tail is offset to the right so that air pressure will force the boat's tail back to the left. The trim tab, though adjustable, must be set and locked and cannot be controlled by the driver as is the rudder.

cont'd

The hulls of hydroplanes are designed so that air pressure on top of the front deck will keep the boat down while the air pressure on the bottom will lift. One with improper deck pressure will "kite" or sail into the air and possibly flip.

The sponsons, pontoon-like runners on each side of the hull, lift the boat to "planing" position. Hydros will actually "walk" on these sponsons - one sponson will touch the water, then the other - back and forth - as it races along.

Just like most of the hydros in the unlimited class, the Miss Bardahl is capable of racing speeds over 180 mph on the straight stretches. Driver Ron Musson pushed the Miss Bardahl to an average speed of over 120 mph in a lap during practice sessions before the 1963 Seattle Seafair Race. A week before in Coeur d'Alene, Idaho, he turned 1:18.421 to set a new Diamond Cup course record. In 1964 Musson set an all-time heat record of 1:13.660 at San Diego. The mile straightaway record for these boats is held by the Miss U.S. I at 200.419 mph set in 1962 on Lake Guntersville, Alabama. Roy Duby drove.

Unlimited hydroplane racing is sanctioned in the United States by the APBA, American Power Boat Association, and consists of seven to ten races in different spots around the country during the year.

The Gold Cup, considered the top event of the season, is held at whichever course bids the highest prize money each year. Detroit bid \$36,500 and hosted the 1963 event, and held the 1964 Gold Cup with a \$40,000 bid. Seattle will hold the 1965 Gold Cup having bid \$50,150.

All APBA sanctioned courses are ovals, usually 3 statute miles around. Each race except the Gold Cup consists of 3 heats of 5 laps each or a total of 45 miles. The Gold Cup is 4 heats or 60 miles.

Because only seven boats are allowed to race at once, each heat is divided into two sections with completely different boats racing in each section of the heat. They are assigned sections by a drawing which takes place before the heat. So a regular race, for instance, would consist of heats 1A, 1B, 2A, 2B, and 3. The seven fastest boats from heats 1 and 2 race in the final.

Points are awarded the finishers of each heat section as follows: 1-400, 2-300, 3-225, 4-169, 5-127, 6-95 and 7-71. Points are added up at the completion of all heats and the boat with the most points wins. In cases of ties, the boat with the fastest total elapsed time for the entire race is the winner.

Points are also awarded to the finishers of each race toward the National High Point Championship for the season. The winning boat receives 400, 2nd- 300, 3rd-225, 4th-169, 5th-127, 6th-95, 7th-71, 8th-53, 9th-40, and 10th-30. In addition, each boat which officially starts in any heat of that race is awarded an extra 50 points whether it finishes or not.

Miss Bardahl's total points for the 1964 season were 3084. She is the National Champion for the second straight year.