

# Anatomy of an 1/8th - Scale R/C Hydroplane

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The following hydroplane dictionary will provide a crash course in R/C hydroplane terminology. This summary is divided into "Hull", "Hardware" and "Systems" categories. Most of the terms described in the "Hull" and "Hardware" sections also apply to the full-sized unlimited hydroplanes, whereas the terms in "Systems" are primarily features of the radio-controlled hydroplanes.



## **HULL**

**1. AIRTRAP** - The inner side of each sponson and nonrip that runs the full length of the hull. The airtraps and bottom side of the ram wing form the tunnel beneath the hull, which "packs" the air and creates lift.

**2. BOW** - The front portion of the hull.

**3. CANARDS** - The canards represent the front wings between the sponsons. In most cases, the canards consist of a stationary spar, which supplies structural support, and adjustable flaps along the trailing edge of the spar. To accommodate changing water conditions, these canards are adjustable to improve the handling and attitude characteristics of the hull during competition.

**4. COWLING** - An aerodynamically-shaped engine cover that is designed to enhance the airflow over the boat. For turbine hydroplanes, the cowling also serves as an air scoop or air intake for the engine. For R/C hydroplanes, the term "cowling" is a generic term, applying to the engine cover, dummy engine, cockpit, canopy and/or nose section of a boat.

**5. DECK** - The curved upper surface of the hull.

**6. VERTICALS** - Vertical wings located near the stern of the hull. They are used to elevate the rear horizontal wing, as well as provide directional stability to the hull.

**7. HORIZONTAL STABILIZER** - The rear wing used to control the attitude of the hull. Stabilizer attack angle influences lift characteristics at the rear of the hull. In effect, this wing can increase or decrease prop weight aerodynamically.

**8. NONTRIP** - An inclined surface located behind the sponson that aides in turning. The term, sponson nontrip, refers to the inclined surfaces of the sponson between the sponson chine and recovery surfaces.

**9. PICKLEFORK** - The term given to hydroplanes with the ram wing leading edge located behind the sponson tips.

**10. RAM WING** - The central, wing-shaped section located between the airtraps of the hull. The design of the ram wing resembles and functions similar to an aircraft wing, providing lift to the hull. This lift, coupled with the pressure built up in the tunnel, allow the hull to literally fly across the water.

**11. TRIPLET** - Small, wing-shaped protrusions located on the outboard, rear edges of the nontrips at the stern of the hull. The triplets are designed to enhance the airflow around the hull and provide aerodynamic recovery surfaces that stabilize the boat when the bow pitches upward.

**12. HYDROSHOES** - A pair of small sponsons, typically located outboard of the airtrap at the stern, which provide lift and stability to the hull.

**13. RIDING PADS** - The lower most surfaces of the sponsons, known as runners, with which the hull contacts the water. The size, shape and attack angle of these pads are important to consider when setting up the ride of a boat.

**14. SPONSONS** - The two pontoon-like extensions that protrude in front of the boat. The sponsons are designed to generate hydrodynamic lift to the hull. At proper running attitude, only a very small portion of the sponson riding pads is actually touching the water.

**15. SPONSON TRANSOM** - The trailing vertical surface of a sponson.

**16. STERN** - The rear portion of a hull.

**17. TRANSOM** - The vertical surface across the back of the hull, from which the rudder and support bracket hardware are mounted.

**18. TUNNEL** - A region underneath the hull that is comprised of the airtraps and bottom surface of the ram wing. The tunnel is designed to "pack" the air traveling underneath the hull, which helps lift the hull from the water.

### **HARDWARE COMPONENTS**

**19. CARBURETOR** - A device at the front of the engine that controls the fuel and air mixture entering the cylinder of the motor.

**20. ENGINE** - A 2-cycle "diesel" motor that is water cooled. It produces approximately 3 horsepower and 20,000 to 25,000 rpm. The size of the engine in the 1/8th scale hydroplane class is restricted to 0.67 cubic inch displacement.

**21. EXHAUST HEADER** - A water-cooled pipe or tube attached to the engine, into which the exhaust gases are discharged.

**22. COUPLER** - High-temperature silicone tubing used to connect the exhaust header to the tuned pipe.

**23. TUNED PIPE** - A bell-shaped pipe that both directs the exhaust towards the transom and provides a super-charging affect to the engine. Adjusting location of the tuned pipe can dramatically affect the torque, rpm and horsepower output of the engine.

**24. MUFFLER** - A device attached to the trailing end of the tuned pipe that reduces noise generated by the engine and exhaust systems.

**25. RUDDER** - A submerged blade, mounted to the transom, that is used in steering the boat.

**26. SKID FIN** - A stationary metal blade mounted behind the right sponson that aides the boat through a turn and helps direct the boat in a straight path on the straight-away.

**27. PROPELLER** - A 2 or 3 blade device, also referred to as "wheel" or "prop," that is located beneath the transom of the boat and provides propulsion. At proper running attitude, only half of the propeller is in the water at any instant.

**28. STUB SHAFT** - A short shaft that is supported by the strut and to which the propeller is attached.

**29. STRUT** - A housing, containing bearings, used to support the stub shaft.

**30. DRIVE SHAFT** - A shaft connecting the engine and the stub shaft. In 1/8th scale R/C hydroplane racing, flexible cables or solid shafts are used.

**31. STUFFING BOX** - A fitting placed in the bottom of the hull, through which the drive shaft passes.

## **SYSTEMS**

**32. FUEL TUBING** - Silicone tubing connecting the fuel tank(s) to the carburetor.

**33. FUEL TANKS** - One or more of these nitromethane and methanol fuel-storage compartments are used. Combined, they have a fuel capacity of 16 to 20 ounces.

**34. ON/OFF SWITCH** - Toggle switches that activate or deactivate either the transmitter or on board radio systems.

**35. RADIO BOX** - A water-tight compartment, or compartments that contain the receiver and other electronic systems.

**36. RECEIVER - A device that receives a signal from the transmitter and relays that signal to the servo.**

**37. SERVO - A device that produces a mechanical output proportional to an electrical signal relayed by the receiver. This output, transferred through the servo horn and linkages, controls the movement of the steering and throttle systems.**

**38. SERVO LINKAGES - Rods used to connect the servos to the controlling systems (e.g., rudder, throttle).**

**39. TRANSMITTER - A device that takes human input and converts it into a radio signal that is sent to the receiver.**

**40. WATER COOLING LINES - Silicone, brass and/or aluminum tubing that connects the water pickup tube at the stern of the hull to the water-cooling head of the engine and cooling coils of the exhaust header. Without water cooling, the engine will overheat and the exhaust couplers will deteriorate at a more rapid rate.**