

**SECTION**

**I**

**LARGE**

**SCALE**

**GAS**

**IMPBA OFFICIAL RULE BOOK**

## LARGE SCALE GAS

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# LARGE SCALE GASOLINE

## I - PREAMBLE

Large Scale Gasoline (LSG) racing rules are intended as a supplement to the General Power Boat rules of IMPBA. In case of a conflict, the LSG racing rules shall prevail. Unless specially mentioned, the IMPBA rules pertaining to hulls and engines in sections other than Large Scale Gasoline do not apply.

Any deviation from the LSG racing rules at an IMPBA sanctioned race by a District and/or host club must be posted in the race flyer.

## II - GENERAL

### A. **Safety Precautions**

1. Sand containers must be present and used as a depository of racers' contaminated fuel. This shall be the responsibility of the host club who will also provide disposal of such fuel.
2. An area must be roped off from spectators and other racers to use as an engine test area.
3. Fire extinguishers must be located in the pit area and engine test areas as well.

### B. **Noise Level Specification**

Maximum dB noise levels of all engines must be equal to or less than the maximum IMPBA National noise level specification. District and/or local club noise requirements that are a lower dB than the IMPBA National specification must be posted on the host club race flyer.

### C. **Fuel**

Gasoline and oil mix of your choice shall be used. No nitro and/or other power boosting additives are allowed in the LSG engine classes.

### D. **Records**

Records will be established for all LSG racing classes except the Open LSG Offshore.

### E. **Protests**

All hull and/or engine protests during a sanctioned contest and/or record trial must be conducted as outlined under Protests in IMPBA rulebook section "Technical Standards".

## III - HULL CLASSIFICATIONS

The intent of the Hull and Class designation is to set standards and guidelines for the LSG classes. The following classes shall be recognized as the official hull/class standards. The Outrigger (Hydro), Catamaran, Mono, Sport Hydro will run in LSG27 or LSG36.

Districts and clubs may run a variation of these classes in order to fill out a class by including the variations on the race flyer. However, the Nationally recognized classes will be run at a National sanctioned event.

There is no restriction against a hull running in more than one class as long as it is a legal hull in the applicable classes.

### A. **Hydro Hulls**

This division will split into three (3) distinct classes.

1. Outrigger (Hydro)
2. Sport Hydro
3. Catamaran

All hydro hulls will conform to current IMPBA "Technical Standards" section, Hydro Hull Definitions and Restrictions.

### B. **Mono Hull**

All hulls must conform to current IMPBA "Technical Standards", Hull Classifications, section MONO Hull Definitions and Restrictions.

## **IV - ENGINE CLASSIFICATION**

The gasoline LSG engine classes shall be divided into classes, distinguished by maximum displacement.  
(Formulas  $CC \times .061 = CID$  or  $CID \text{ divided by } .061 = CC$ )

### **A. General Engine Rules for the LSG 27 Classes**

LSG27 Up to 1.647 cid maximum (27.0 cc maximum)

1. Maximum displacement will not exceed 27.0 cc.
2. All engines must have a canister muffler, tuned pipe, or custom exhaust that meets the current IMPBA db levels (as per section K-4 of the IMPBA Technical Standards).
3. All 2 cycle engines must be naturally aspirated.
4. All 4 cycle engines must be naturally aspirated.
5. Internal and external modifications may be made to the engines major and minor components.
6. Single piece cylinders or cylinders with removable head buttons are allowed.
7. Major and minor parts from secondary manufacturers may be used.
8. The engine must use spark ignition. No glow plug or compression induced combustion allowed.
9. Each engine must have a working throttle control and the engine must be set up to be completely stopped with the transmitter controls.
10. Any size or brand name carburetor may be used.
11. Pull start or belt/pulley start are acceptable methods of starting the engine.

### **B. General Engine Rules for the LSG 36 Engine Classes**

LSG36 1.648 cid thru 2.196 cid maximum (36.0 cc maximum)

1. Maximum displacement will not exceed 36.0 cc.
2. All engines must have a canister muffler, tuned pipe, or custom exhaust that meets the current IMPBA Db levels (as per section K-4 of the IMPBA Technical Standards).
3. All 2 cycle engines must be naturally aspirated.
4. All 4 cycle engines must be naturally aspirated.
5. Internal and external modifications may be made to the engines major and minor components.
6. Single piece cylinders or cylinders with removable head buttons are allowed.
7. Major and minor parts from secondary manufacturers may be used.
8. The engine must use spark ignition. No glow plug or compression induced combustion allowed.
9. Each engine must have a working throttle control and the engine must be set up to be completely stopped with the transmitter controls.
10. Any size or brand name carburetor may be used.
11. Pull start or belt/pulley start are acceptable methods of starting the engine.

### C. Engine Class Designation – TL5G54

The intent of this engine class is to utilize either a single motor with two fully functional cylinders, or with two separate fully functional single cylinder gas engines.

1. The **minimum** displacement for each cylinder will be no less than 15cc for each cylinder with a combined total of 30cc.
2. The **maximum** displacement for each cylinder must not exceed 27cc for each cylinder with combined total of 54cc.
3. **The maximum displacement of 54cc will apply only to this IMPBA TL5G54 Class.** All other gasoline classes will still follow the maximum displacements of 27cc and 36cc for their respective L5G27 or 5G36 engine types.
4. The boat must be powered by either a single motor with two fully functional cylinders, or with two separate single cylinder motors as per these TL5G54 Engine rules.
5. This will be a Naturally Aspirated GASOLINE POWERED ONLY class.
6. These boats MUST also comply with all IMPBA current Noise, Weight and Hull Size rules and regulations.

## V - SPECIALTY CLASSES

### A. SLS Mono

#### 1. Purpose

The intent of this SLS class is to utilize commercially manufactured gasoline powered 2-cycle engines that utilize the Cantilever crankshaft configuration.

#### 2. Hull Specification

The hull will conform to current IMPBA "Technical Standards", Mono Hull Definitions and Restrictions.

#### 3. Engine Specification

- a. The engine must be a commercially manufactured gasoline powered 2-cycle engines that utilize the Cantilever crankshaft configuration with a maximum displacement of 2.916cid / 36.000cc.
- b. Each engine must have a working throttle control and the engine must be set up to be completely stopped with the transmitter controls.
- c. Internal and external modifications may be made to the engine's major and/or minor parts. However, the cylinder and the head assembly must be a single unit. No removable heads and/or head buttons allowed. Water-cooling is allowed.
- d. The engine must use a spark plug type ignition, no glow plug or compression induced combustion allowed. All engines must have a positive on-off switch, or in lieu of this switch, the primary ignition lead must be removed from the spark plug except when in the pits, out of the spectator area, or in preparation for racing.
- e. The carburetor must be limited to a maximum venturi of .500 inches or less. Any brand name carburetor may be used. All engines must be normally aspirated and the original factory reed valve or piston ported fuel induction system must be used on each motor.
- f. All engines must have a canister type muffler. If a single hole or exhaust tube/pipe out of the muffler is used, the inside diameter must not exceed 3/4 inch. If dual holes or exhaust tubes/pipes are used exiting the muffler, then the maximum inside diameter must not exceed 1/2 inch each. The canister muffler must be mounted directly to the exhaust flange of the engine. If a spacer is used between the muffler and the flange, a maximum spacer thickness of one inch (1") will be allowed. Custom exhaust systems or tuned pipes are not allowed.

## B. **Sport Hydro**

### 1. **Purpose**

The intent of the Gas Sport Hydro class is to provide a LSG racing class that must resemble all Sport Hydro, Limited Inboard, Unlimited Light, and Unlimited Hydroplane classes of present or past design as closely as possible with the exception that Outrigger, Modified Outrigger, and/or Tunnel hulls are not permitted.

### 2. **Hull Specification**

- a. The hull must be a three (3)- point suspension hydroplane ("Technical Standards", Hulls Classification, 3-point Suspension Hull) with two (2) individual steps (sponsons). In between these two steps, (sponsons) the Hull must be solid and continuous with no separation, gaps , or boom tubes. These steps (sponsons) must terminate at or before the hull mid-point.(see Fig.1 Item A) The Sponsons may have breaks or pads.The Hull must be continuous with no steps or extra planning surfaces aft of the hull midpoint. No rear "shoes", "pads", or "wedges" are allowed. The only exception to the 3-point requirement is the Canard hull ("Technical Standards", Hulls Classification, Canard Hulls), defined as having two rear sponsons and a single forward sponson will be allowed to run in the class.
- b. The width of the hull extending from the rear of the front sponsons to the transom must be a minimum of 8 inches in width, measured at either the deck or chine line, whichever is widest. (see Fig.1 Item B)
- c. If the bow is recessed behind the tips of the sponsons, that recess must be no larger than 25% of the overall length of the boat. (see Fig.1 Item C)
- d. The strut must not have a width greater than 9/16 inches or a length longer than three (3) inches.
- e. The boat must have a name and/or sponsor's name and racing number affixed to the hull (a local, national, or fictitious sponsors name is acceptable).
- f. The Boat must have a driver and or simulated cockpit.
- g. All Hulls must be limited to a maximum overall length of 52 inches and a maximum overall width of 28 inches.

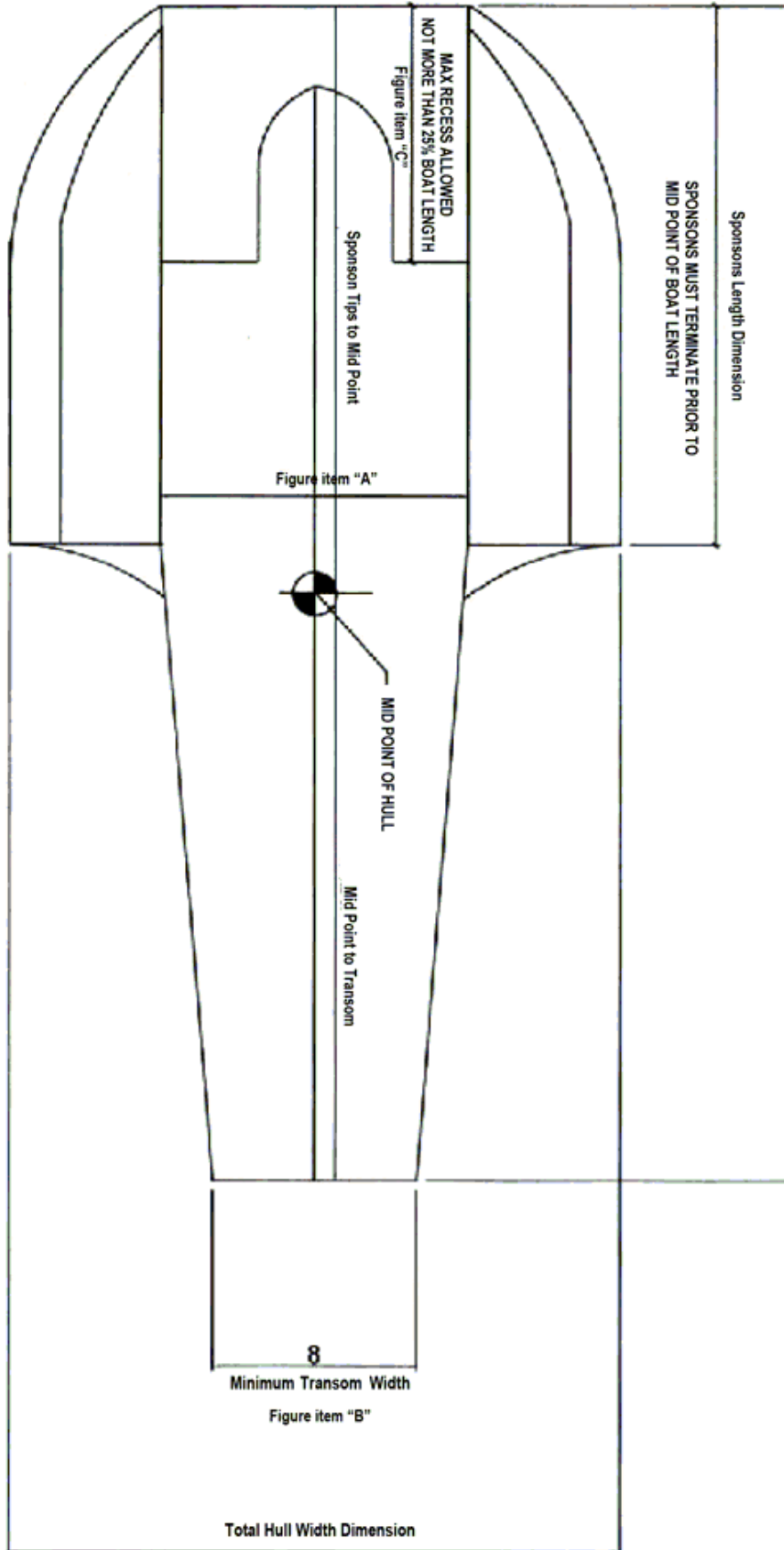
See Figure 1.

### 3. **Engine Specification**

- a. The boat must be powered by an LSG engine as specified in the General Engine Rules for the (LSG) Engine Classes.
- b. All engines must have a canister muffler, custom muffled exhaust system or tuned pipe.

LEGAL SPORT "GAS" HYDRO HULL  
PLAN VIEW

**FIGURE 1**



**C. Twin Gas Outrigger Hydro Class**

1. The boat must be power by either a single motor with two fully functional cylinders, or with two separate single-cylinder motors as per the TLSG Engine rules.
2. This will be a GASOLINE POWERED ONLY class.
3. The maximum hull length will be 60 inches including driveline hardware. No driveline or steering hardware may extend beyond 6 inches maximum from the transom.
4. The maximum weight of the complete race ready boat with fuel shall not exceed 25 pounds.
5. The boat must have each motor or both motors connected to either one or two shafts/propellers that are functional and are connected to the drive while propelling the boat forward.
6. These boats MUST also comply with all IMPBA current Noise rules.

**D. Open LSG Offshore**

**1. Purpose**

The intent of the Open LSG Offshore class is to provide a LSG racing class that duplicates the full size American Power Boat association (A.P.B.A.) Offshore Racing class as closely as possible.

**2. Specification**

- a. This class follows all current IMPBA guidelines found in "Nitro Specialized Classes" section Model Offshore Power Boat Racing.
- b. All IMPBA legal LSG engines are permitted.
- c. Stepped bottom deep vee hulls are permitted to run in this class providing they meet all other criteria and standards.
- d. The host club shall decide the racecourse and the race format.

**E. Crackerbox**

**1. Purpose**

The intent of the Quarter Scale Crackerbox class is to provide a LSG racing class that duplicates the full-size Crackerbox class as closely as possible.

**2. Hull Specification**

- a. The basic hull lines of the quarter scale Crackerbox must conform to the lines of the full-size Crackerbox racing Runabout.
- b. All boats must conform to the following measurements:
  - i. Minimum length is 42", maximum length is 49".
  - ii. Minimum width at the widest point is 15", width must be in proportion to the length.
  - iii. No ride pads or strakes allowed.
  - iv. The bottom must be no more a 5-degree vee (deadrise) at the transom, 2-1/2 degrees per side.
- c. The deck/hatch must resemble the deck of a full-scale racing Crackerbox.
- d. The boat must be painted or finished in the spirit of a racing scale model. The letter "P" must precede or follow the racing number on each side. Minimum size of the letter and numbers is 2".
- e. Two drivers of scale-like appearance with helmets and life jackets must be used in the driver/rider compartment. Cartoon or profile figures are not allowed.
- f. Instrument panel, steering wheel and other detailing are not mandatory but are encouraged.



### 3. **Engine Specifications**

- a. Spec engines will be a Zenoah G260 PUM ONLY.
- b. The engine may run a stock unmodified 257 or the original 644 with choke carburetor.
- c. No internal modifications are allowed. Replacement parts must be from the original manufacturer and same type engine (example: Zenoah 260 to Zenoah 260). No part swapping from other manufacturers or engine types is permitted.
- d. The engine ignition coil may be moved to another location on the engine or the hull.
- e. Each engine must have a working throttle control and the engine must be set up to be completely stopped with the transmitter controls.
- f. Recoil pull-start must be the primary method of starting. EZ start & pulleys acceptable.
- g. The top three finishers at the IMPBA Gas Nationals may be torn down and checked using the specs as listed below. If the engine & muffler is not legal they will be disqualified from the event.
- h. All engines and mufflers are subject to inspection at any time during the event.
- i. All engines must have a canister muffler, custom muffled exhaust system or tuned pipe.
  - i. With the exception of the canister muffler, the muffled exhaust system or tuned pipe must be enclosed by the hull.
  - ii. No part of the exhaust system or tuned pipe, including a muffler, shall extend more than 4 inches behind the transom.
- j. Stock motor inspection to include all parts of motor as defined in Super Sport Class.

### 4. **Drive Train**

- a. The drive train may be straight or flex drive.
- b. The propeller, rudder or any hardware must not protrude farther than 4 inches beyond the transom.
- c. No hardware may be used that would introduce "non-trip" to the boat. No angled trim tabs. Skegged struts are allowed. Turn fins must be mounted to the transom and perpendicular to the bottom of the boat.

## F. **Super Sport Class**

### 1. **Purpose**

The intent of the Super Sport class is to provide a LSG racing class that enables the contestant to compete with a factory stock engine.

### 2. **Hull Specification**

The Super Sport class shall be offered as a Mono hull class.

- a. The Mono hulls will conform to current IMPBA "Technical Standards" section, Mono Hull Definitions and Restrictions.

### 3. **Engine Specifications**

- a. Spec engines will be a Zenoah G260 PUM ONLY.
- b. The Engine may run a stock unmodified 257 or the original 644 with choke carburetor.
- c. **No internal modifications are allowed.** Replacement parts must be from the original manufacturer and the same type engine (Example: Zenoah 260 to Zenoah 260). No part swapping from other manufacturers or engine types is permitted.
- d. The engine ignition coil may be moved to another location on the engine or hull.
- e. Each engine must have a working throttle control and the engine must be set up to be completely stopped with the transmitter controls.
- f. Recoil pull start must the primary method of starting. EZ Start and pulleys are acceptable.

- g. The top 3 finishers at the annual IMPBA Gas Nats may be torn down and will be checked using the following Specs as listed below. If the engine & muffler is not legal they will be disqualified from the event.
- h. All engines & mufflers are subject to inspection at any time during the event

#### 4. **Stock Motor Inspection**

Inspection to include all parts of motor:

- a. Fasteners: Stock or Stainless
- b. Gasket Thickness: Carburetor .017 to 0.023; Manifold .017 to .023; Case .017 to .019; Base/Barrel .014 to .018 may be copper or fiber
- c. Seals: Springs
- d. Bearings: Stock
- e. Flywheel: Diameter 2.358 to 2.362, Thickness .800 to .810 – Keyway .118 to .123
- f. Crank Rod, Piston, and Ring – Keyway .118 to .123  
Piston diameter above ring compared to piston diameter below wristpin  
= max. diameter difference of 0.0015
- g. Intake Manifold: Thickness .680 to .702  
(Allow to sand gasket sealing area only to make flat)
- h. Ignition Parts – Color (original red & gray) – Slotted Holes
- i. Case to Crank Shaft Top .908 to .912
- j. Barrel (Cylinder) Depth 1.9650 to 2.0000
- k. Must have original cooling cap – painting, anodizing, and etching allowed.
- l. 34mm (1.338 inch) bore, 28mm (1.102 inch) stroke.

#### 5. **Muffler**

- a. All engines must have tuned pipe or canister type muffler. The exhaust must meet all current IMPBA noise regulations (no megaphones). Modifications may be made to the inside of the muffler if they will still meet the noise level limitations currently in place in the IMPBA Rule Book after modifications.
- b. If a single hole or exhaust tube/stack out of the muffler is used, the inside diameter must not exceed 3/4 inches. If dual holes or exhaust tubes/stacks are used exiting the muffler, then the maximum inside diameter must not exceed 1/2 inch each.
- c. The canister type can muffler must be mounted directly to the exhaust flange of the engine. If a spacer is used for cooling between the muffler and the flange, a maximum spacer thickness of one inch (1") will be allowed.

### **G. Classic Thunderboat**

#### 1. **Hull Specifications**

- a. Boats may be wood or fiberglass/composite type construction.
- b. Length shall be a maximum of 56 inches, minimum of 47 inches. Width shall be a minimum of 22 inches.
- c. All boats shall have a front or rear cockpit with driver figures from the 1950s - 1970s era, no cartoon or animal characters.
- d. All boats shall have a period correct paint scheme and sponsor name & logo. The Sponsor and/or logo may be original or of your own choice.
- e. Normal hull configuration shall be conventional round nose, shovel nose, dropped sponson or pickle fork design. The pickle fork shall not exceed 10% of the hull length and be modeled after a classic era boat (1950s-1970s era).

- f. The ride-pad of the sponson may extend up to 1/8 inch beyond the sponson transom. No rear sponson, or other riding surface allowed aft of the sponson transom. Engine belly pans are allowed. Engine belly pans may not extend beyond the engine compartment.
- g. Nothing may extend more than 5 1/4 inches beyond the transom.
- h. The strut mounting is optional. Maximum strut length of 3 1/2 inches in length and 1/2 inch in width.
- i. A minimum 50% of the gasoline engine must be covered with either a cowling or period correct fake engine. This does not include header and/or tuned pipe.

## 2. **Engine Specifications**

IMPBA Super Sport Engine specification rules, as outlined in the IMPBA rulebook Section I - Large Scale Gasoline will apply with the following exceptions:

- a. Any exhaust system allowed. The exhaust system must be concealed within the hull and may exit from rear, side or bottom. Only the outlet may show. All boats must meet current IMPBA noise rules.
- b. An unmodified Walbro #257 carburetor may be substituted for the factory original carburetor.
- c. Any composite or copper type replacement gasket set may be used but must be minimum .014 inch to maximum .018 inch thickness.
- d. The engine must be equipped with a recoil starter and this starter must be the primary means of starting the engine. Supplementary starters are allowed. The brand of starter is optional. The brand of starter including the EZ Start is optional.

## H. **Jersey Speed Skiff**

- 1. Prop shaft and tube must pass thru the bottom of the Boat
- 2. No fairing on top of prop shaft tube
- 3. Strut must be rounded on bottom to prevent it from becoming a ride surface
- 4. No hardware past 4" from stern
- 5. No skegs or turnfins
- 6. Pipes allowed. Exhaust must exit thru transom. No part of exhaust more than 1" aft of transom
- 7. Engine hatch required. Motor will be completely covered
- 8. Trim tabs allowed. No trim tabs with fins, or skegs on bottom
- 9. Any LSG-27 engine allowed
- 10. Must have 2 scale driver's, minimum height of 3.5" with life jackets and helmets
- 11. Boats will have "JS" followed by number on both sides of the hull. Minimum height 3.5"
- 12. Strakes or riding pads are NOT LEGAL. (no strakes, keels, or chines on bottom. That means the bottoms are flat in a scaled down size boat)
- 13. Wood boats are legal but must simulate the lap strake construction
- 14. Max length 51" minimum 49"
- 15. Min width at center of hull 18"
- 16. Max width of bottom at transom 11"
- 17. Max degree of vee of bottom at transom (.5) degree
- 18. Max degree of vee of bottom at center of hull (.5) degree
- 19. Min freeboard at transom 5.5"
- 20. Min freeboard at center of hull 6.5"
- 21. Min freeboard at 10" from bow 6.5"

## **VI - GAS SCALE UNLIMITED**

### **A. General**

The purpose is to realistically duplicate the Unlimited Hydroplanes for gasoline powered racing.

### **B. Function of District Scale Director**

#### **1. Responsibilities**

- a. Coordinates registrations for their district.
- b. Has the power to appoint a committee to resolve protests.
- c. Oversees the operation of scale hydros in the district and assists IMPBA in scale hydro matters.
- d. Keeps point record for district high-point trophy if needed.
- e. When vacancies occur, this position will be appointed by the current District Director or the National Scale Hydro Chairman.

#### **2. Registration Procedures**

- a. All boats must be registered with the District Scale Director.
- b. The District Scale Director will require the following information in writing:
  - i. Name, address and phone number
  - ii. IMPBA number
  - iii. Unlimited name, year raced, and number
  - iv. Length and beam of prototype boat and model
  - v. Prototype designer and boat colors
  - vi. Must submit a photo of prototype boat
  - vii. If required by district a \$5.00 annual registration fee to be submitted upon completion of model & prior to it competing in a sanctioned event. Purpose of fees-monies is to cover registration printing costs & postage fees.
  - viii. A boat registered in one District may race in any District.
- c. Boat must compete at a racing event within one year from registration.

### **C. Engine and Boat Specifications**

1. All models must be of a real unlimited hydroplane listed in the APBA/H1 Master Hull Roster list. In the event of a question of legality, the burden of proof falls upon the owner to prove the real boat raced or qualified in a sanctioned event, in the configuration being modeled, via photographic and/or written documentation. Failure to adequately meet the validation requirements can result in disqualification.
2. All boats to be built to a scale of 1.8" to 1'0" (1/6.667 scale) plus or minus 10% of the beam and 5% of the length.
3. Boats will look as scale as possible and meet the following requirements for racing and scale judging:
  - a. Cockpit with driver
  - b. Complete all major lettering and paint schemes
  - c. Gasoline engine and complete exhaust system excluding up to 1" of exhaust outlet must be concealed with fake engine or cowling as per prototype boat.

4. Hull bottom and running hardware will not be judged or checked. However, hull must not deviate from conventional 3-point hydro (unless prototype was a different design).
  - a. Hull bottom must be scale appearing.
  - b. Belly pans are acceptable to clear engine and/or flywheel but maximum width shall be no greater than 5". Belly pan may not be used as a form of planing surface and can not exceed the depth of any riding surface or recovery surface.
  - c. Secondary front sponson running surfaces are optional.
  - d. Air traps are optional.
5. Engine must not exceed a maximum displacement of 31.00cc utilizing a single gasoline fuel engine with spark ignition and must comply with all IMPBA LSG engine and noise rules.
6. Boat shall use same number of propellers as the prototype.
7. The drive dog must not extend beyond the transom unless the prototype's strut and/or drive dog did so. Photo documentation may be requested for proof by race CD or district scale director.
8. No twin rudder assemblies allowed.
9. Boats must have the ability to change radio frequency if using non DSM type radio.

**D. Rules for Optional Scale Judging (Concours)**

1. Boat must accumulate 50 points minimum in heat racing to qualify for scale judging.
2. Judging points to be separate from racing points.
3. All boats are to be judged at a distance no closer than 5 feet.
4. A picture must be submitted for the scale judging. Failure to submit picture disqualifies boat from Concours judging.
5. Points as follows:
  - a. 1 to 10 overall scale appearance
  - b. 1 to 10 for detail, engine, cowl, driver, etc.
  - c. 1 to 10 for paint job, markings, etc.
  - d. 1 to 10 for construction

**E. Racing Rules**

1. Normal IMPBA driving rules will be followed.
2. Only the registered owner can race his gas unlimited hydroplane.
3. Cutting or hitting a buoy at any time shall incur a 50-point penalty.
4. Normal heat racing rules to be used as racing format and each heat will be limited to no more than 6 boats raced together at any one time.
5. If any removable parts (cowling(s), wing(s), dummy engine, driver, etc.) fall off during a heat, except as the result of a collision, that boat will receive no more than sixth place points for that heat. This penalization does not affect the finishing placement of the boat, only the points awarded. The points awarded and placements of the other boats in the heat are not affected by this ruling.

**F. Records**

1. Records shall be established in the Gas Scale Unlimited class as listed in the "Records" section of Rules of Competition.
2. Only boats properly registered will be eligible to establish records.
3. Only the registered owner can attempt to set a record with the registered Scale Unlimited.

## **VII – LSG INTERNATIONAL REGATTA**

### **A. US-1 Eligible Classes**

The following 16 classes may enter the 1/16 mile SAW, 1/3 mile Oval, and multi-boat heat racing events at a US-1 format LSG International Regatta to be eligible for the US-1 International Champion and Excellence of Performance Trophies per Section E-Procedures.

1. All records eligible gas classes.