

COMPETITION GUIDE:

2009 RIVA RACING HYDRODRAG SERIES



PREFACE: The 2009 Riva Racing HydroDrag Series is in its second year and is the only sanctioned personal watercraft drag race event of its kind in history. The event design, structure, and organization is continually being revised to offer safe, competitive, and fun competition. Please keep this in mind, the organizer's intent is to provide the ultimate in safe, fun, and entertaining events and will make necessary changes to ensure this happens.

THIS COMPETITION GUIDE IS A COMPLIMENT TO THE APBA PWC RACING RULE BOOK. PLEASE REVIEW THE APBA RULE BOOK FOR RULE CLARIFICATION AND DETAIL.

Membership

All aspects of competition outlined in the 2009 APBA rule book will be adhered to. EVERY PARTICIPANT IN THE HYDRODRAG NATIONALS IS ABSOLUTELY REQUIRED TO BE A CURRENT COMPETITION MEMBER OF THE APBA IN GOOD STANDING.

Sanctions

All aspects of competition outlined in the 2009 APBA rule book will be adhered to with noted changes.

Speed Alley: Top speed event where competitors compete individually on a long, marked, **straight course to gain maximum speed while being measured by a radar device.** Direction (to or from) Radar Gun location will be determined on-site with respect to the weather conditions and venue layout.

1. Speed Alley format - Each competitor will have two (2) opportunities (runs) to post their greatest top speed.
2. The course will be marked with a starting point buoy - with ample room to gain speed of roughly $\frac{1}{4}$ - $\frac{1}{2}$ mile - and a target/finish area buoy, with ample room to decelerate.
3. The competitor with the fastest recorded top speed in his class will be deemed the winner

Prizes and Awards - As this is a very unique, produced by WaterTop Unlimited, Competitors winning their respective classes in the RIVA Racing HydroDrag Nationals will receive a very unique, trophy/conversation piece. Both the Hydro Limited and Hydro Pro classes will receive cash prizes in addition.

Overall Series Championship Scoring - The 2009 HydroDrag Series will consist of three events (Spring, Summer, and Fall Nationals) and crown a 2009 Overall Champion in each of the four HydroDrag classes following the final event. The following formula will be used to determine overall points for each class.

- Competitor will receive two (2) points for each Winners bracket heat win.
- Competitor will receive one (1) point for each Losers bracket heat win.
- Competitor reaching class final ending in runner-up position will receive seven (7) points.
- Competitor reaching class final and winning final will receive fifteen (15) points.

The competitor with the highest points total after all three 2009 HydroDrag Events will be deemed the 2009 HydroDrag Series Champion for that class.

A competitor can qualify for only one set of points per class, no matter the number of PWC he is competing on. No combining points will be allowed.

Boat Numbering System

All aspects of competition outlined in the 2009 APBA rule book will be adhered to with the following exceptions:

Each rider will affix a number over 100 to both sides of their watercraft and must be a minimum of 7" tall. Following the number must be the letter signifying which class they are competing in that is a minimum of 5" tall. The following letters signify the classes.

- Hydro Unlimited: U
- Hydro Limited: L
- Hydro Stock: S
- Hydro Vintage: V

This system is to help the officials, tech inspectors, starters, scoring, announcers, and spectators differentiate classes and riders. (Example: Stock class PWC = "255-s"

General Safety Rules – Specific safety rules for HydroDrags to follow in section 17.2

10.2 SAFETY GEAR

10.2.1 It is the responsibility of the participant to select a helmet and other safety equipment that will provide adequate protection during competition. The APBA does not endorse or guarantee specific products or manufacturers of safety equipment. Riders must rely on their own judgment in the selection of safety equipment to be used in competition for safety and durability.

10.2.2 A rider, his/her mechanic, and any pit crew members, when operating registered equipment bearing APBA numbers or designation at any time while at a sanctioned event, must wear complete safety equipment including helmet and like jacket at all times while on the water.

10.2.3 Helmets

- a. A properly fitting helmet that meets the current Department of Transportation (DOT) or current Snell standards is required to be worn at all times in competition.
- b. The only time a helmet is not required to be worn is during a Freestyle competition.
- c. It is highly recommended that any helmet involved in an accident be returned to the appropriate manufacturer for inspection and repair, if necessary.
- d. A full face helmet is mandatory. Without exception, no face shields/ guards of any kind will be allowed. Helmets with bolt-on face shields are not allowed.
- e. No plastic, bicycle type, BMX, or similar designed headgear will be allowed.

10.2.4 Life Jackets -

- a. A U.S. Coast Guard approved, type I or III, full jacket personal flotation device (life jacket) will be worn by all participants at all times while on the water.
- b. Every rider shall certify his/her flotation equipment to function properly when requested by an APBA official.
- c. It is recommended that all jackets have buckle-type straps across closures.

10.2.5 Eye protection in the form of goggles shall be highly recommended for all personal watercraft racing.

10.2.6 Back protection and protective footwear are recommended for all riders at all APBA sanctioned events.

10.2.7 The Race Director of an event shall have the authority to prohibit the use of any helmet, personal flotation device (life jacket), or other equipment which the Race Director may consider unsafe, insufficient protection or inadequate.

10.2.8 No participant shall participate in an APBA sanctioned event with any type of splint, including but not limited to, a cast or brace applied to his/ her body, without written approval from a doctor and approval by the Race Director of the event.

10.2.9 No rider shall be allowed to compete if it is determined by an official that the rider is under the influence of alcohol or drugs.

10.2.10 It is the Race Director's authority to deny participation of any rider that, in the opinion of the Race Director, the rider may be hazardous to the other participants, spectators, or themselves.

10.2.11 Any participant that exhibits dangerous or unsportsmanlike conduct at any time during a sanctioned event may be fined, penalized, or removed from an event.

10.2.12 Dismounted riders, if uninjured, should wave hands above head as an "okay" signal.

10.2.13 After crossing the finish line, a rider/boat shall not interfere with any other rider/boat still in the race so as to affect the time of such boat at the finish or create a safety hazard.

RULE 17 - DRAG RACING

17.1 GENERAL REGULATIONS

17.1.1 **Overview:** Drag racing is an event where two competitors race side-by-side on a straight course of a set distance with the winner advancing to the next round through a bracket system. A double elimination format is the most common format. The standard length for a drag racing event is to use a 1/8 mile (660 feet) format, however, other length courses can be used based on the event and race site. For National events the standard 1/8 mile format should be used.

17.2 GENERAL SAFETY EQUIPMENT - DRAG RACING

17.2.1 **In addition to the APBA General Safety Rules outlined in Rule 10** on page 20 the following additional safety rules must be adhered to for all drag racing events. It is the responsibility of the participant to select the proper safety equipment that will provide adequate protection during competition. The APBA does not endorse or guarantee specific products or manufacturers of safety equipment. Riders must rely on their own judgment in the selection of safety equipment to be used in competition for safety and durability.

17.2.2 **Helmets** - Visors must be removed from all helmets.

17.2.3 Life Jackets -

- a. A U.S. Coast Guard approved, type I or III, full jacket personal flotation device (life jacket) will be worn by all participants at all times while on the water. Personal Flotation Device must meet 100 mph impact standards or more.

- b. A Class XX Personal Flotation device with neck collar can be worn by any and all participants.
- 17.2.4 **Protective Eyewear** - It is mandatory that eye protection in the form of DOT approved goggles/eyewear be worn at all times while practicing and/or racing.
- 17.2.5 **Gloves and Footwear** - It is mandatory that every rider wear gloves and closed toe-footwear at all times while practicing and/or racing.
- 17.2.6 **Neoprene Riding Gear** - It is mandatory that every rider wear, at minimum, neoprene shorts, or shorts with a neoprene liner at all times while practicing and/or racing. Shorty, spring, full neoprene wetsuits, and drysuits are also acceptable.
- 17.2.7 **Neck Protection** - It is highly recommended that neck protection be worn by the participants. Considering the fact that there is no safest neck protection device that will eliminate all risks, the participants are solely and ultimately responsible for selecting a suitable neck protection device that they feel will provide the proper safety protection for racing.

17.3 GENERAL SAFETY RULES - DRAG RACING

- 17.3.1 Any person in the staging and starting line area will be required to wear safety eye protection.
- 17.3.2 All watercraft are to be "cleaned/blown out" (clean fuel delivery system and exhaust system) in the designated warm up area only. The starting line area is off limits to these actions, and all riders must stay at least 100 feet behind the starting line while staging and remain at idle within 200 feet of starting line/system area at all times.
- 17.3.3 An operable tether (engine kill switch) must to be attached to the operator and the watercraft anytime the watercraft is running.
- 17.3.4 The rider must have both feet completely down in/on the footwell, forward of the rear end of the seat for the entire duration of the race (no "Supermans" and no placing feet behind rear most point of the seat, in case of three-seater/two-piece seat PWC, rider can not place feet behind rear most point of forward half of two piece seat).
- 17.3.5 Each PWC must have its seat securely attached at all time during tuning, practice, and competition.
- 17.3.6 A racer's pit/race crew may only be in staging area during the times that the participant's watercraft is racing.
- 17.3.7 Any added weight must be secured safely in the watercraft where it will not shift or bounce during racing. A driver cannot wear weight belts or any weight adding device.
- 17.3.8 The Race Director or any tech personal can disqualify any one that does not follow safety rules.

17.4 RACE COURSE

- 17.4.1 **Course Length:** Other than the maximum course length and minimum lane width, variations in course dimensions may be set by the promoter.
- 17.4.2 **Course Length National Events:** The course length for all National and National Championship events shall be 660 feet (1/8th mile). Official APBA Drag Racing records will be set only at approved APBA National events.
- 17.4.3 **Course Width:** The minimum lane width is twenty five (25) feet. The individual lanes will be separated by a series of buoys to clearly mark the lanes or buoy line string the length of the track.
- 17.4.4 **Finish Line:** The finish line should be clearly marked with large buoys with two officials in line to determine winner. A video camera for "photo finish" calls is recommended.

17.5 DRAG RACING RULES

- 17.5.1 **The following rules apply to all APBA sanctioned Personal Watercraft Racing (PWR) events. There may be some variations in the format from event to event. All such variations must be advertised for the information and must be convenience of the competitors.**

17.5.2 Single Elimination Racing Format

- 1. In all classes, up to two watercraft will race per elimination heat.

2. Heat qualifiers will advance until up to two finalists remain.
3. Points will be awarded only to the driver of the watercraft.

17.5.3 **Double Elimination Racing Format**

1. The competitors will be aligned in a bracket system with random placements to start competition.
2. A double elimination format will be utilized (with a minimum of six competitors). Winning rider of a race heat moves to next level of the bracket. Losing rider of a heat race (being his or her first heat loss) moves to losing bracket in attempt to continue.
3. Following two heat losses competitor is eliminated from the competition in that class.
4. The rider who reaches the final round and wins that race will be named the event champion in that class.
5. Points will be awarded only to the driver of the watercraft.

17.5.4 **Order of Classes:** The order of classes to be run will be determined by the Promoter or Race Director and properly publicized or posted for the convenience and information of the competitors.

17.5.5 **False Starts:** If a competitor false starts, or jumps the gate the racer will be red flagged and the racer will be penalized or disqualified for that heat at the discretion of the Race Director. The racer will be disqualified from that particular race upon the second violation.

17.5.6 **Interference:** If a competitor interferes with another competitor - coming over, squeezing, drifting, etc - causing spray or wakes that interfere with the other competitors' ability to navigate the track safely, the racer at fault will be disqualified for that heat. The racer will be disqualified from that particular race upon the second violation.

17.5.7 **HydroDrag Starting System - the Launch Pad** – A new and innovative starting system will be utilized that is designed entertain the crowd with a visual spectacle of large shower of water upon the start of each race. The system will also provide an absolute equal starting opportunity for both competitors from a fixed, floating dock. A double bunk system will be utilized in which both craft will sit atop a double bunk starting gate in which competitors personal watercraft will be raised out of the water to the point only the crafts' jet pump intake is submerged, allowing for the pump to be loaded. Upon the start signal, the "gate" will be dropped, dropping the double bunk system roughly 6", floating the personal watercraft, beginning the race. If a competitor false starts, or jumps the gate (driving off of the bunks) he or she will be red flagged and disqualified for that heat at the discretion of the Race Director. The racer will be disqualified from that particular race upon the second violation.

ALL PERSONAL WATERCRAFT MUST BE DESIGNED FOR AND PREPARED TO SIT ON A DUAL BUNK SYSTEM MEASURING FIVE FEET IN LENGTH WITH INDIVIDUAL BUNK TUBING OF 2.5" (width 12" to best fit all hulls). HULL MATERIAL MUST BE DURABLE IN THIS AREA AND BE ABLE TO EASILY SLIDE ACROSS THIS BUNK SYSTEM.

HydroDrag Starting Procedure – The HydroDrag will utilize a new invention the HYDRODRAG LAUNCH PAD, a mechanical bunk drop system where two watercraft will start side-by-side with engine running atop a bunk system attached to a stationary, floating structure. The Launch Pad bunks will be on either side of the floating structure and will have a two parallel bunks constructed of 2.5" aluminum tubing running five feet in length and spaced 12" apart.

Participants will approach the Launch Pad and with engine off position their PWC on to the bunks with the transom bond line lined up to be even with a marked line on the floating structure.

Each participant's bunk system will be raised out of the water with rider in position to the point where the intake is in the water and pump is loaded with water when running. Each rider can give as much throttle as possible WITH OUT sliding off of the bunk, in which case

would result in a false start. (Only one false start is permitted per heat before participant is deemed looser of that heat or final)

The starter will stand on floating platform with 30 second board. After each participant give the ready signal the 30 second board will be flipped and the gate starter can drop the Launch Pad bunks at anytime after to begin that race. Participants leave the Launch Pad and steer towards the finish line in their respective lane on the very outside of their respective lane.

If a participant – intentionally or unintentionally – interferes with the competitor, that participant will be penalized by being forfeiting that particular heat. If this happens more than once with the same participant, that participant may be expelled for that day's competition at the discretion of the race director or technical director.

RULE 23 – GENERAL TECHNICAL RULES – ALL CLASSES

READ ALL RULES PERTAINING TO YOUR CLASS – SOME BASIC RULES MAY BE AMENDED AS PER SPECIFIC CLASS MODIFICATION ALLOWANCES.

23.1 OVERVIEW

23.1.1 The following are the general requirements and technical rules that apply to all classes (*Stock, Limited, Vintage Modified and Unlimited*). The decision of the Technical Inspector and/or Race Director regarding modifications will be final. Any question regarding the legality of modifications should be directed to the APBA prior to use in competition.

23.2 SOUND LEVEL – WAIVED FOR WATERTOP HYDRODRAG EVENTS

~~23.2.1 The sound level shall not exceed 86 decibels measured at a distance of 75 feet. For Runabout Open classes only, the sound level shall not exceed 100 decibels measured at a distance of 75 feet. For GP Ski class only, the sound level shall not exceed 95 decibels measured at a distance of 75 feet.~~

~~23.2.2 If local regulations prevent a sound increase to 100 decibels for the Runabout Open classes or 95 decibels for GP Ski, the Race Director may institute the same 86 decibel limitations that apply to all other classes. If the 86 db limitation is required to be enforced, the Race Director or Promoter must give adequate notice to all competitors. Any notice greater than 20 days will be deemed adequate notice by the APBA.~~

23.3 FUEL

23.3.1 Fuel must consist of **unleaded gasoline only**. For the purpose of this rulebook "gasoline" is defined as a mixture of hydrocarbons and oxygen bearing compounds with the following clarifications:

- Oxygen content must not increase the specific energy of the gasoline.
- Oxygen content must not exceed 3.7% by weight.
- Oxygen content must have been blended in by the refiner or the fuel manufacturer.
- Specific gravity must be between: .715 - .770 at 60°F (15°C).
- The only allowable oxygenates are ethers and alcohols. Epoxides (example: propylene oxide) will not be considered ethers. Nitrogen bearing compounds are not allowed.

- Most commercially produced unleaded fuels and oils will meet these criteria. However some may contain additional additives that do not to meet these criteria. If a racer is unsure about his/her fuel the racer should have it tested by a Technical Inspector.

23.3.2 Failure to not meet the **APBA fuel criteria is punishable by a fine** at the discretion of the Race Director not to exceed \$100.

23.4 TOW STRAP

23.4.1 All watercraft must have a flexible tow loop or tow strap attached to the bow of the watercraft. The tow loop should be made of some type of flexible material (example: plastic coated braided steel, nylon strap, braided rope, etc.) so as not to create a hazard. Watercraft equipped with tow hooks that protrude beyond the plane of the hull must remove the tow hook. It is the rider's responsibility to provide an adequate tow strap on the front of their watercraft. Racers failing to have a tow strap on their watercraft, or having a tow strap that breaks while in tow, may be fined and/or disqualified at the discretion of the Race Director.

23.5 TETHER SWITCH/LANYARD

23.5.1 In the event that a rider crashed or becomes dislodged from his/her watercraft, and the engine continues to run, and the tether (safety disconnect) switch fails to function, or is not properly fastened or attached to the rider or rider's life vest, the rider will be disqualified from the heat that the infraction occurred. It is the rider's responsibility to fasten the tether securely.

23.5.2 Tether/Lanyard may not be wrapped around the handlebar or any other part of the watercraft during a race. The lanyard must be attached to the rider and be able to disconnect and stop the engine in the event the rider becomes separated from their watercraft. Riders wrapping the tether around the handlebar will be subject to penalty or fine at the discretion of the Race Director.

23.5.3 Riders are allowed two (2) tethers/lanyards on their person while racing. One will be the primary, and the second will be a backup in the event that the primary lanyard should fail or get lost. Riders plugging in a back up lanyard, while the primary lanyard is held above head, in the case of a dead engine restart (penalty), will receive an automatic disqualification.

23.6 GENERAL MAINTENANCE

23.6.1 **General Replacement Parts:** Replacement of general maintenance parts (e.g., spark plugs, spark plug wires, spark plug caps, wiring, seals, water hoses, fuel lines, clamps and fasteners) shall not be restricted to original equipment. Aftermarket pump and driveshaft bearings are allowed.

23.6.2 **Starter:** Replacement starter motor and bendix may be used.

23.6.3 **Oil Injection:** The Oil Injection system may be disconnected or removed.

23.6.4 **Engine Mounts:** Replacement engine mounts may be used.

23.6.5 **Repairing Stripped Threads:** Stripped threads must be repaired to the original size.

23.6.6 **Fasteners:** Fasteners (e.g., bolts, nuts and washers) may not be substituted with titanium pieces in Stock and Limited classes unless originally equipped. Fasteners may integrate locking mechanisms.

- 23.6.7 **Batteries:** Replacement batteries are allowed but must fit into the original equipment battery box and must be securely fastened. Relocation is allowed in Limited and **UNLIMITED** Runabout classes only.
- 23.6.8 **Bilge Pump:** The original bilge pump may be modified or disconnected. Aftermarket bilge draining systems that do not create a hazard are allowed.
- 23.6.9 **Crankcase Repairs:** Repairs to cracked or punctured crankcases may be made provided only one damaged area affecting one cylinder bank has been repaired. No other modifications or repairs are allowed.

23.7 COSMETIC CHANGES

- 23.7.1 **Hull:** Padding and/or mat kits may be added and custom painting is allowed. The surface finish of any metal component outside the hull area above the bond flange may be painted, polished or plated.
- 23.7.2 **Hull Repairs:** Hull and deck repairs may be made to a watercraft. Repairs must not alter the original configuration of the outside hull by more than 2.0 mm (0.08 in.). Ski division watercraft may reinforce the hull to provide strength for the hull to withstand impact of course obstacles as long as the original configuration of the outside of the hull is not altered by more than 2.0 mm (0.08 in.). – **UNLIMITED CLASS ALLOWS GREATER MODIFICATION VARIENCES**
- 23.7.3 **Storage, Mirrors, Handles and Gauges:** Drop-in type storage buckets, bolt-on type mirrors, handles and gauges may be modified, aftermarket, or removed provided a hazard is not created. No additional airflow may be created by the removal of mirrors in Stock classes.
- 23.7.4 **Engine:** External modifications to the engine finish (e.g., painting, plating or polishing) are allowed for cosmetic purposes only.
- 23.7.5 **Bumpers/Siderails:** Replacement bumpers and side rails may be used provided a hazard is not created.
- 23.7.6 **Spray Deflector:** A soft, flexible type water spray deflector may be attached to the hull sides or to the bond flange of the watercraft provided a hazard is not created. No part of the spray deflector may extend beyond the perimeter of the original equipment bumper or side moldings as measured by a plumb line.

23.8 SPONSONS

- 23.8.1 **General Rule:** All watercraft may be equipped with a maximum of two sponsons. Sponsons may be aftermarket, modified, repositioned or removed. The overall length of each sponson shall not exceed 36.0 in (91.45 cm). Sponsons shall not protrude from the side of the hull by more than 3.94 inch (100 mm) when measured in a level horizontal plane. Sponsons must be made of one piece - two pieces that screw together to create one piece is allowed. All parts of the sponson must be made of safe material that would not injure another rider should the part fall off or be struck in the sponson area. Wood is not an acceptable material.
- 23.8.2 **Runabout Division Only:** No part of the sponson shall extend downward below the point at which the side of the hull intersects the bottom surface of the hull by more than 2.5 inch (63.5mm). Aftermarket or modified sponsons must exceed .24 inch (6mm) in thickness. All leading edges must be radiused so as not to create a hazard. Sponsons may not be attached to the planing surfaces of the hull.

23.9 STEERING SYSTEM

- 23.9.1 **Handlebar:** Handlebar, grips, throttle, throttle cable may be modified or aftermarket. The handlebar cover may be modified or removed. The handlebar must be padded at the mounting bracket or, if it has a crossbar, the crossbar must be padded.
- 23.9.2 **Switches:** Aftermarket switches and switch housings may be used.
- 23.9.3 **Steering Shaft and Components:** Steering shaft, steering shaft holder and handlebar holder may be aftermarket. Quick-turn steering modifications to alter steering ratio are allowed. Aftermarket steering cables will be allowed.
- 23.9.4 **O.P.A.S Block-Offs:** Off Power Assisted Steering (OPAS) block-offs may be used on Sea-Doo watercraft models equipped with this feature to fill in the void from the removal of this product for racing. Both the Riva Performance OPAS block-offs and Pro Series block off have been approved for APBA racing in all classes. Other types of products by different aftermarket manufacturers will be approved on an individual basis.

23.10 OTHER GENERAL RULES

- 23.10.1 **Intake Grate:** The Intake grate may be modified or aftermarket. The Intake grate must be the full-length type with at least one bar running parallel to the drive shaft. Grates may not extend more than 0.47 in. (12mm) below the flat plane of the pump intake area. All leading edges must have radiuses so as not to create a hazard.
- 23.10.2 **Ride Plate:** The ride plate or pump cover plate may be modified or aftermarket. An extension may be added to the rear of the pump cover plate. The extension shall not exceed the width of the original equipment plate. Modified and aftermarket plates must not extend more than 3.94 in. (100.0mm) beyond the end of the original equipment plate for Ski and Sport Divisions or 7.00 in. (177.80mm) for the Runabout Division. The sides of the extension must be connected to the radiused portion of the pump plate so as not to create a hazard. Fins, rudders, skegs and other appendages that may create a hazard will not be allowed.
- 23.10.3 **Impeller:** Impeller may be modified or aftermarket. The original diameter must be maintained in Stock class.
- 23.10.4 **Pump:** Replacement wear rings that are within OEM internal diameter specifications may be used. Silicone adhesive sealant may be used in addition to original equipment seal to seal the pump inlet. If equipped, a visibility spout must be removed or plugged.
- 23.10.5 **Fuel Tank:** Fuel tank must be OEM as supplied by the OEM manufacturer. An OEM fuel tank is the only tank that can be used to supply fuel to the engine.
- 23.10.6 **Catch Cans:** **Catch Cans may be used for the purpose of preventing crankcase oil overflow and prevent oil from entering and the hull. Any other use of a catch can is not allowed.**

Launching and Beaching

C-54 (canal-54) is part of the St. Johns Water Management District and is the ideal venue for this type of activity. This venue is not a high traffic area, but we must respect other boaters utilizing the waters. The launch ramp is also small and beach area is limited. It will be necessary to minimize your time on the shoreline and plan your launching and retrieving to accommodate all participants and to adhere to the time schedule. ATVs and beach carts are ideal.

HYDRODRAG RACING CLASSES

HYDRO STOCK CLASS – The Hydro Stock class will adhere to all **STOCK RUNABOUT CLASS** technical rules outlined in the 2009 APBA rule book in regard to runabouts with no exceptions.

RULE 24 - TECHNICAL RULES – STOCK CLASSES

24.1 OVERVIEW

24.1.1 The intent of the Stock class rules is to establish a venue in which all riders and machines can compete at their own level with a relatively modest investment in equipment and maintenance costs. These rules are definitions and guidelines for allowable modifications or alterations. If a definition, modification or alteration is not cited, then it is to be construed that no modification, alteration or change can be made to the component unless it is specifically approved by the APBA Rules Committee. Original equipment parts may be updated to newer original equipment parts of the same model. The part must be a bolt-on type part that requires no modifications to that part or any other parts except where rules allow substitutions or modifications. The rules and regulations below are in addition to all General Technical rules listed in Rule 23.

24.4 SEATS

24.4.1 **Runabout Division Only:** Original equipment seat base must be used. The seat cover and padding may be changed. Seat height may be changed provided the original seat base is used.

24.5 HULL

24.5.1 **Trim Plate:** Replacement trim plates or trim tabs may be used. Only replacement parts that offer handling characteristics the same as stock are allowed. The material shall not be restricted to original equipment as long as a hazard is not created (example: aluminum may be used in place of plastic). The Trim plate should be free of any sharp edges.

24.5.3 **Ballast Weight:** Ballast weight may be added within the normally exposed areas of the hull to alter the handling of the watercraft provided a hazard is not created. Only weight consisting of constant mass (i.e., water or other fluid is not allowed) that does not require the modification or relocation of any parts will be allowed unless such modification or relocation is specified by other rules.

24.6 ENGINE - TWO-STROKE

24.6.1 **Engines:** Engines may be bored. Replacement piston assemblies may be used provided the original port timing, compression ratio, dome profile, skirt length and shape and type of material are not changed. Non-conforming pistons (i.e.: skirt shape that is not an exact replica of the OEM piston) may be approved by the APBA but such approval must be obtained in writing. Replacement piston assemblies must weigh within $\pm 25.00\%$ of the original equipment. Chamfering of cylinder ports must not exceed 1.00mm (0.04 in.) at a 30 degree maximum angle. No internal modifications of any kind, including grinding, surfacing, polishing, machining, shot peening, etc., will be allowed on any engine components. Engine girdle systems like one made by Pro-Tec Performance are allowed.

24.6.2 **Engine Displacement:** Engine displacement must not exceed class designation. Exception – Maximum allowable displacement over class designation may not exceed 803cc for the 800cc Stock Ski classes.

- 24.6.3 **Rave Valves and Caps:** Rave Valves may be trimmed to allow for oversized pistons. Rave Valve Caps may be drilled so that an inspection can be made to insure valves are functioning properly. Modifying the Rave Valve and Caps for any other reason is not allowed.
- 24.6.4 **Gaskets:** Replacement gaskets may be used but must be of the same type (e.g., sheet, o-ring, etc.) as their OEM counterparts. Replacement base gaskets must not be thicker than 0.8 mm (0.032 in). Replacement head gaskets shall be allowed a tolerance of up to 0.005 mm (0.002 in) thinner than the original OEM head gasket and up to 1.5mm (0.06 in) thicker than the original OEM head gasket. □ All other gaskets shall be allowed a tolerance of plus or minus 20%. Modifications to the head and exhaust manifold to head pipe gaskets is allowed. Additional holes may be added or subtracted. All other gaskets must have the same OEM pattern. All gaskets must meet the thickness and tolerances as outlined in the rule.
- 24.6.5 **Reeds:** Reed petals may be modified or aftermarket provided the original equipment reed stop and cage assembly are used.
- 24.6.6 **Crankshaft:** Crankshaft may be rebuilt using replacement counterweights, crank pins, bearings and connecting rods. Counterweights, crank pins and connecting rods made of non-ferrous metals are not allowed. Stroke and rod length may not be changed. Counterweights on non-rebuildable style crankshafts may be machined to accept a press-through crank pin. Replacement bearings must maintain their original type and dimensions. Replacement counterweights must resemble the original part (e.g., holes and/or pockets not existing on the original part may not be on the replacement part). The total weight of the crankshaft assembly must be within ± 5 % of the original equipment weight. Crankpins may be welded and/or keyed to the counterweights.
- 24.6.7 **Cooling System:** The cooling system may be modified or aftermarket and aftermarket cooling lines and water bypass systems may be used. Additional cooling supply lines and fittings may be added to the pump. Fittings may not be added to the cylinder head, cylinder, or crankcase. Bypass fittings may be modified, aftermarket and/or relocated but must be directed downward and/or rearward so as not to create a hazard for other riders. Any valves used within the entire cooling system must be of the fixed type or automatic (e.g., thermostats, pressure regulators, etc.). Cooling system flush kits are allowed.
- 24.6.8 **Exhaust:** The exhaust system must remain stock as supplied by the manufacturer. An insert may be added to reduce the inside diameter of the stinger portion of the exhaust system. Electronically controlled water injections systems are not allowed unless originally equipped. Manually controlled devices (by any means of actuation) that alter the flow of cooling water during operation are not allowed. The original OEM water inlet fitting may be drilled to accept a maximum size of ¼ inch NPT by ½ inch barbed fitting. Exhaust system stinger end may be drilled and tapped for injection of water only, no other modifications to the exhaust system is allowed.
- 24.6.9 **Waterboxes:** Damaged water boxes may be repaired, including by means of welding. No changes to the interior of the water box (i.e. baffles) are allowed whether these changes are the result of damage or repair. Repairs may cause no performance gains. Sea-Doo XP DI water box may be used as a replacement for XP Limited and Sea-Doo XP (951 cc models).
- 24.6.10 **Ventilation:** Engine compartment ventilation tubes may be modified, aftermarket, or removed. **Inlet and outlet openings may not be enlarged** (i.e., when the tube is removed, the opening may not be larger than stock). **Vents may be shielded or plugged. No other modifications to the hood will be allowed.**

- 24.6.11 **Driveline Components:** No internal modifications of any kind, including grinding, surfacing, polishing, machining, shot peening, etc., will be allowed on any driveline components (e.g., pump stator, reduction nozzle, etc.).
- 24.6.15 **1) Ignition: The Ignition must remain OEM and can not be modified or altered in any way. RPM limiter function may not be bypassed or eliminated. CDI unit must be OEM and can not be modified or aftermarket. Ignition timing may be changed. Modifications to the original equipment ignition pickup mount are not allowed. Original equipment charging system must be used.**
- 24.6.16 **2) The head and base gaskets must be OEM. Replacement gaskets that are the same thickness as OEM will be allowed.**
- 24.6.17 **3) Bore must be stock, however, an overbore allowance of 1mm over stock will be allowed.**

24.7 ENGINE - FOUR-STROKE

- 24.7.1 **Cylinder Head:** Cylinder head combustion chambers may be cleaned by bead blasting with valves seated in place. Intake and exhaust ports may not be bead blasted or cleaned with abrasive material such as steel wool or Scotch-Brite®. Repairs to the cylinder head affecting one cylinder bank are allowed.
- 24.7.2 **Crankshaft:** Crankshaft must remain stock. Replacement bearings or bearing shells are allowed, providing they maintain their original type and dimensions.
- 24.7.3 **Camshafts:** Camshaft(s) must remain stock. Replacement bearings or bearing shells are allowed, providing that they maintain their original type and dimensions.
- 24.7.4 **Intake and Exhaust Valves:** Intake and exhaust valves may be shimmed with OEM or aftermarket shims.
- 24.7.5 **Runabouts Only - Valve Spring Retainers:** Aftermarket Valve Spring Retainers are allowed.
- 24.7.6 **Cooling System:** The cooling system may be modified or aftermarket. Aftermarket cooling lines and water bypass systems may be used. Additional cooling supply lines and fittings may be added to the pump. Fittings may not be added to the cylinder head, cylinder, or crankcase. Bypass fittings may be modified, aftermarket and/or relocated but must be directed downward and/or rearward so as not to create a hazard for other riders. Any valves used within the entire cooling system must be of the fixed type or automatic (e.g., thermostats, pressure regulators, etc.). Electronically controlled water injections systems are not allowed unless originally equipped. Manually controlled devices (by any means of actuation) that alter the flow of cooling water during operation are not allowed. Cooling system flush kits are allowed.
- 24.7.7 **Valve Cover:** Valve cover may be modified or replaced for cosmetic purposes and/or weight reduction only.
- 24.7.8 **Stripped Threads:** Stripped threads must be repaired to the original size.
- 24.7.9 **Fuel System:** Fuel injectors and fuel pump must remain stock. Fuel pressure regulator may be modified to change fuel pressure.
- 24.7.10 **Replacement Fasteners** - Fasteners (e.g., bolts, nuts and washers) may not be substituted with titanium pieces unless originally equipped. Fasteners may integrate locking mechanisms.
- 24.7.11 **Actuator Arm** - Hydrospace S4 owners may use an aftermarket waste gate actuating arm.
- 24.7.12 **Engine Displacement:** Four-stroke Ski watercraft are limited to 1600cc as furnished by the manufacturer. If a Runabout, as furnished by the manufacturer, exceeds 1600cc then the maximum displacement shall be the OEM displacement plus 1mm overbore on all cylinders. The maximum displacement that may be achieved by any Runabout class watercraft is 2000cc.

24.8 IGNITION AND ELECTRONICS - TWO-STROKE

- 24.8.1 **Electronic Control Unit (ECU)** - The original electronic control unit may be modified or aftermarket so long as it does not offer any additional inputs or outputs than the original unit, and it must connect with the original connections. No additional sensors may be added (e.g., exhaust gas temperature, detonation sensors, etc.). Engine temperature sensors may be disabled. ECU may not be programmed to alter the original function of the OEM controls and or switches.
- 24.8.2 **Ignition:** Ignition timing may be altered by slotting ignition trigger mounting plate. An adapter plate may be used for the sole purpose of relocating the ignition trigger. Woodruff key may be modified or removed.

24.9 IGNITION AND ELECTRONICS - FOUR-STROKE

- 24.9.1 **Runabout Only - Electronic Control Unit (ECU):** The original electronic control unit may be modified or aftermarket. Any ECU that requires additional inputs or outputs, additional sensors to be added (e.g., exhaust gas temperature, detonation sensors, etc.), etc. must be approved by the APBA in writing before being allowed to be used. Engine temperature sensors may be disabled. The ECU may not be programmed to alter the original function of the OEM controls and or switches.
- 24.9.2 **Ignition:** Ignition timing may be altered by slotting ignition trigger mounting plate. An adapter plate may be used for the sole purpose of relocating the ignition trigger.

24.10 AIR/FUEL DELIVERY - TWO-STROKE

- 24.10.1 **Flame Arresters:** Aftermarket flame arresters that meet USCG, UL-1 111 or SAE J-1928 Marine standards may be used. Flame arrestor mesh can not be removed or modified. Pre-filter flame arrestor covers are allowed.
- 24.10.2 **Carburetor:** Carburetor jets (replaceable type), needle valves, and needle valve springs may be changed. The choke may be removed provided additional air intake for the engine is not created. An aftermarket primer system may be installed. No drilling, tapping or boring any part of the carburetor. Throttle plate angles or modifications to the throttle plate are not allowed. No other carburetor modifications are allowed.
- 24.10.3 **Fuel System:** The entire fuel system is a closed system. The watercraft must not vent or spill fuel at any attitude with or without the engine running. The original equipment fuel tank, fuel filter, fuel pickup, fuel filler, fuel tap assembly and relief valve must be used and cannot be modified. Fuel petcock may be bypassed. Additional fuel filters may be used. Fuel tank filler cap may be modified or aftermarket provided a hazard is not created.

24.11 AIR/FUEL DELIVERY - FOUR-STROKE

- 24.11.1 **Flame Arrestor:** Flame arrestors that meet USCG, UL-1 111 or SAE J-1928 Marine backfire flame arrester test standards must be installed. Flame arrestor mesh can not be removed or modified. Pre-filter flame arrestor covers are allowed.
- 24.11.2 **Electronic Fuel-Injection Systems:** Flame arrestors that meet USCG, UL-1 111 or SAE J-1928 Marine backfire flame arrester test standards must be installed. Flame arrestor mesh can not be removed or modified. Pre-filter flame arrestor covers are allowed. If not equipped with an airflow sensor, the ducting between the flame arrestor and throttle body may be modified or aftermarket. If originally equipped with an airflow sensor, the ducting may be modified or aftermarket between the flame arrestor and airflow sensor. Modifications to the airflow downstream of the airflow sensor are not allowed. No modifications to the turbocharger and supercharger system are allowed.

24.11.3 **Throttle Body:** Throttle body housing must remain as supplied by the OEM manufacturer. No modifications are allowed, including the changing of the number of throttle plates and or angles.

24.11.4 **Carburetor:** Carburetor jets (replaceable type), needle valves and needle valve springs may be changed. Choke may be removed provided additional air intake for the engine is not created. Aftermarket primer system may be installed. No other carburetor modifications will be allowed. The R&D Powershot fuel injection tuning module and fuel controller may be used.

24.12 TURBOCHARGER/SUPERCHARGER

24.12.1 **Turbocharger/Supercharger:** Modifications to any part of the turbocharger or supercharger system (i.e., housing, turbines, rotors, sensors, ducting, spacing, etc.) are not allowed. On Sea-Doo supercharged models the OEM ceramic clutch washer may be aftermarket.

24.13 STOCK CLASS SUMMARY

The items listed below need not be OEM for participation in the Stock classes. See specific class rules for more details and specifications.

- 1) Starter Motor
- 2) Engine Gaskets
- 3) Flywheel Key
- 4) Engine Mounts
- 5) Fuel Filter, Fuel Hose
- 6) Control Cables and Housings
- 7) Carburetor Pivot Arm
- 8) Throttle Lever, Handlebars, Grips
- 9) Handlepole, Handlepole Bushings, Spring or Spring Helper
- 10) Coupler Dampers and Coupler Shroud
- 11) Pump Bearings
- 12) Engine and Pump Seals
- 13) Battery
- 14) Mats, Decals, Hood Seal
- 15) Bond Rails
- 16) Flame Arrestors
- 17) Impeller
- 18) Rideplate and Intake grate
- 19) Pistons

24.14 COMMON REASONS FOR DISQUALIFICATION – STOCK CLASS

The following is a list of common reasons for disqualification in the Stock class; this listing is not necessary a complete list of all reasons that a rider/PWC may be disqualified, but include the most common reasons. .

- 1) Missing tow strap on watercraft.
- 2) Cylinder ports have been modified beyond tolerable limits listed in the rulebook.
- 3) Carburetors have been modified past factory specs.
- 4) Flame arrestor mesh has been removed or modified.
- 5) Cylinder head has been milled down.

- 6) Cylinder has been decked or milled beyond factory specs.
- 7) Aftermarket or lightened flywheel.
- 8) Exhaust system or waterbox modifications.
- 9) Pump modifications or nozzle boring in Runabout classes.
- 10) No rubber nose bumper.
- 11) Additional hull or hood ventilation for increased airflow to engine.
- 12) Engine gaskets beyond tolerable limits as specified in rulebook.
- 13) Aftermarket or modified supercharger impeller.
- 14) Sponson length/depth exceeds specifications in rulebook.
- 15) Intake grate depth has been exceeded beyond rulebook specs.
- 16) Rideplate length exceeds rulebook specs.
- 17) Crankcases have been decked/modified.
- 18) Pump stuffer/modifications to pump shoe or inlet duct.
- 19) Improper backdating of pipe/exhaust system.

HYDRO LIMITED CLASS - The Hydro Limited class will adhere to all LIMITED RUNABOUT CLASS technical rules outlined in the 2009 APBA rule book in regard to runabouts with no exceptions.

RULE 25 - TECHNICAL RULES – LIMITED CLASSES

25.1 OVERVIEW

25.1.1 Limited classes give competitors an opportunity to perform additional modifications to their watercraft while still being able to compete with a relatively modest investment in equipment. The rules and regulations outlined in the Limited class section are in addition to all General Technical rules listed in Rule 23. All watercraft must remain strictly stock except where rules allow or require substitutions or modifications. Changes or modifications not listed in the rulebook are not permitted. Original equipment parts may be updated or backdated with original equipment parts of the same model. The part must be a bolt-on requiring no modifications to that part or any other parts except where rules allow substitutions or modifications. Watercraft competing in the Limited class must conform to the specifications which follow.

25.2 FOUR-STROKE SKI AND RUNABOUT DIVISION WATERCRAFT

- 25.2.1 **Special Rules:** Special rules apply to four-stroke turbo and supercharged watercraft for participation in Limited classes. **Turbo/Supercharged four-stroke watercraft must run by Stock class rules (see Rules 22 and 23) in all Limited classes with the exceptions outlined below.**
- 25.2.3 **Runabouts Only - Seats:** Original equipment seat base must be used. The seat cover and padding may be changed. Seat height may be changed provided the original seat base is used.
- 25.2.4 **Runabouts Only - Driveline** - Impeller housing, stator vane assembly, pump mounting plate and/or pump shoe may be modified or aftermarket. No titanium driveshaft, impeller housing or stator vane assemblies. Impeller may be modified or aftermarket. Pump nozzle and directional

nozzle may be modified or aftermarket. Overall length of the complete pump and nozzle assembly may be no more than 50.00mm (1.97 in.) longer than original equipment. Aftermarket nozzle-trim systems may be used. Additional cooling fittings may be installed. Visibility spout must be removed or plugged. Silicone adhesive sealant may be used in addition to original equipment seal to seal pump inlet. Couplers, bearing housing and driveshaft may be modified or aftermarket provided they maintain a 1:1 drive ratio between the engine and the pump.

- 25.2.5 **Runabouts Only - Turbo/Supercharger Impeller:** Modifications in this rule are not allowed to be made on a PWC that has been modified subject to rule 25.2.6. Turbocharger impeller **or supercharger impeller may be modified or aftermarket. The impeller housing must remain stock as supplied by the manufacturer.**
- 25.2.6 **Runabouts Only - Camshafts and Valves:** Modifications in this rule are not allowed to be made on a PWC that has been modified subject to rule 25.2.5. Camshafts may be modified or aftermarket. Valves may be modified or aftermarket. Valve seats may be modified. Springs may be modified or aftermarket. Pushrods may be modified or aftermarket. Replacement valves, pushrods, and seats may not be titanium unless originally equipped.
- 25.2.7 **Runabouts Only - Valve Spring Retainers:** Aftermarket Valve Spring Retainers are allowed.
- 25.2.8 **Runabouts Only - Intercoolers** - Intercoolers may be modified or aftermarket. Intercooler heat exchange surface area may not be increased by more than 25%. Intercoolers may be relocated.
- 25.2.9 **Resonator:** Resonator may be bypassed or removed. Original Waterbox/muffler must be used. Replacement hose/tubing from the waterbox to exit is allowed provided the OEM exit location is maintained.

25.3 SEATS TWO-STROKE AND FOUR-STROKE N/A

- 25.3.1 **Seats:** Seat assembly may be aftermarket on all Two-Stroke and Four-Stroke N/A Runabout models. The seat cover and padding may be changed. Seat height may be changed.

25.4 HULL

- 25.4.1 **Trim Tabs/Plates:** Aftermarket fixed position trim tabs may be used. Original equipment trim plates that are detachable from the hull may be removed or replaced when installing aftermarket trim tabs. Trim tabs cannot exceed the width of the planing surface or extend rearward more than 3.94 inch (100.00mm) beyond the end of the original planing surface. Manual or automatic trim tabs attached to the hull or ride plate are not allowed. All hull extensions mounted on the hull's transom will be considered as a trim tab. All edges must be radiused so as not to create a hazard. Fins, skegs, rudders and other appendages that may create a hazard are not allowed.
- 25.4.2 **Hood Modifications** - No modification will be allowed (i.e., no additional ventilation, etc.). Modifications will be subject to Race Director or Technical Directors' approval.
- 25.4.3 **Engine Compartment Foam Removal:** Engine compartment foam may be removed, modified or aftermarket. Only floatation foam within the engine compartment may be removed. Only foam that can be removed without modification to any other part or parts, except where rules allow the parts to be modified, is allowed. Parts may not be relocated based on the removal of the foam. The hull's inner liner or deck may not be cut or modified to remove foam. Removal of foam between layers of the hull and/or deck is not allowed.
- 25.4.4 **Ventilation:** Engine compartment ventilation tubes may be modified, aftermarket, relocated on the original equipment ducting, or removed. **Inlet and outlet openings may not be enlarged**

(i.e., when the tube is removed, the opening may not be larger than stock). Vents may be shielded or plugged. No other modifications to the hood is allowed. **NO ADDITIONAL VENTING IN ADDITION TO OEM VENTS IS PERMITTED**

- 25.4.5 **Ballast Weight:** Ballast weight may be added within the normally exposed areas of the hull to alter the handling of the watercraft provided a hazard is not created. Only weight consisting of constant mass (i.e., water or other fluid is not allowed) that does not require the modification or relocation of any parts will be allowed unless such modification or relocation is specified by other rules.

25.5 ENGINE - TWO STROKE

- 25.5.1 **Legal Updates:** Yamaha SuperJets produced before 1996 may update to 1996 and newer engine components and waterbox. Kawasaki JS750SX and SXi may update to SXi Pro engine components and waterbox.
- 25.5.2 **Engines:** Engines may be bored. Replacement piston assemblies may be used provided the original port timing, compression ratio, dome profile, skirt length and shape and type of material are not changed. Non-conforming pistons (i.e.: skirt shape that is not an exact replica of the OEM piston) may be approved by the APBA but such approval must be obtained in writing. Replacement piston assemblies must weigh within $\pm 25.00\%$ of original equipment. Chamfering of cylinder ports must not exceed 1.00mm (0.04 in.) at a 30 degree maximum angle. Cylinders may be machined to accept girdle system cylinder heads.
- 25.5.3 **Gaskets:** Replacement gaskets may be used but must be of the same type (e.g., sheet, o-ring, etc.) as their OEM counterparts. Replacement base gaskets must not be thicker than 1.52 mm (0.060 in). Replacement head gaskets shall be allowed a tolerance of up to 0.005 mm (0.002 in) thinner than the original OEM head gasket and up to 1.5mm (0.06 in) thicker than the original OEM head gasket. □ All other gaskets shall be allowed a tolerance of plus or minus 20%. Modifications to the head and exhaust manifold to head pipe gaskets is allowed. Additional holes may be added or subtracted. All other gaskets must have the same OEM pattern. All gaskets must meet the thickness and tolerances as outlined in the rule.
- 25.5.4 **Engine Displacement:** Engine displacement must not exceed class designation.
- 25.5.5 **Crankshaft:** The crankshaft may be rebuilt using replacement counterweights, crank pins, bearings and connecting rods. Counterweights, crank pins and connecting rods made of non-ferrous metals are not allowed. Stroke and rod length may not be changed. Counterweights on non-rebuildable style crankshafts may be machined to accept a press-through crank pin. Replacement bearings must maintain their original type and dimensions. Replacement counterweights must resemble the original part (i.e., holes and/or pockets not existing on the original part may not be on the replacement part). The total weight of the crankshaft assembly must be within $\pm 5.00\%$ of the original equipment weight. Crankpins may be welded and/or keyed to the counterweights.
- 25.5.6 **Cylinders:** Cylinders may be interchanged between watercraft of the same manufacturer. Any modifications to the cylinder or crankcase must be approved, in writing, by the APBA.
- 25.5.7 **Engine Cases – Cylinder Modifications:** No internal modifications of any kind, including grinding, surfacing, polishing, machining, shot peening, etc., will be allowed on any engine components.
- 25.5.8 **Cylinder Head:** Cylinder head and gasket may be modified or aftermarket.
- 25.5.9 **Exhaust System:** Exhaust manifold, head pipe, expansion chamber, gaskets and hose between expansion chamber and OEM waterbox may be modified/altered or aftermarket. Exhaust location of the exhaust gases may not be relocated. Original size opening must be maintained

for exhaust exit. Original equipment waterbox must be used and may not be modified. No tuned portion of the exhaust shall protrude outside the hull. Through-hull exhaust outlet flap may be removed.

25.5.10 **Resonator:** Resonator may be bypassed or removed. Original Waterbox/muffler must be used. Replacement hose/tubing from the waterbox to exit is allowed provided the OEM exit location is maintained.

25.5.11 **Cooling System:** The cooling system may be modified or aftermarket and additional cooling lines may be added. Aftermarket water bypass systems may be used. Cooling system bypass fittings may be modified or aftermarket and/or relocated, however, if relocated, the fittings must be directed downward and/or rearward so as not to create a hazard for other riders. Any valves that are used within the entire cooling system must be of the fixed type or automatic (e.g., thermostats, pressure regulators, solenoids, etc.). Manually controlled devices (by any means of actuation) that alter the flow of cooling water during operation are not allowed. Original cooling system thermostat may be removed, modified or aftermarket. Cooling system flush kits are allowed.

25.6

ENGINE - 4-STROKE NON TURBO/SUPERCHARGED ONLY

25.6.1 **Engines:** Engines may be bored. Replacement piston assemblies may be used provided the original port timing, compression ratio, dome profile, skirt length and shape and type of material are not changed. Replacement piston assemblies must weigh within $\pm 25.00\%$ of original equipment. Engine displacement must not exceed class.

25.6.2 **Crankshaft:** The crankshaft may be rebuilt or replaced provided by the following: Counterweights and material type must maintain the shape and dimensions as provided by the manufacturer. Stroke and rod lengths may not be changed. Counterweights may be deburred to remove only casting flaws, no other machining or knife edging of counterweights are allowed. Rod journals must maintain their OEM diameters/dimensions. Main journals must maintain their OEM diameters/dimensions. Cross drilling of the crankshaft to improve oil flow or redirection is allowed. Replacement bearing shells are allowed provided the following: maximum allowable undersized bearing is .060 inch (1.5mm). Total weight of the crankshaft assembly must be within $\pm 5\%$ of the original equipment weight. Damaged rod or main journals may be welded and machined to their OEM dimensions or within the allowable bearing sizes.

25.6.3 **Crankcase Repairs:** Repairs to cracked or punctured crankcases may be made provided only one damaged area affecting one cylinder bank has been repaired. Crankcase drain and cable may be removed and plugged. No other modifications or repairs are allowed.

25.6.4 **Cooling System:** Aftermarket cooling lines and water bypass systems may be used. Additional cooling supply lines and fittings may be added to the pump. Bypass fittings may be modified, aftermarket and/or relocated but must be directed downward and/or rearward so as not to create a hazard for other riders. Any valves used within the entire cooling system must be of the fixed type or automatic (e.g., thermostats, pressure regulators, solenoids, etc.). Manually controlled devices (by any means of actuation) that alter the flow of cooling water during operation are not allowed. Cooling system flush kits are allowed.

25.6.5 **Camshafts:** Camshafts may be modified or aftermarket.

25.6.6 **Valves and Components:** Valves may be modified or aftermarket. Valve seats may be modified. Springs may be modified or aftermarket. Pushrods may be modified or aftermarket. Replacement valves, pushrods, and seats may not be titanium unless originally equipped.

25.6.7 **Resonator:** Resonator may be bypassed or removed. Original Waterbox/muffler must be used. Replacement hose/tubing from the waterbox to exit is allowed provided the OEM exit location is maintained.

25.6.8 **Intercooler:** Intercooler may be modified or aftermarket.

25.7 AIR/FUEL DELIVERY - TWO STROKE

25.7.1 **Carburetor:** Carburetor(s) may be modified or aftermarket provided they do not vent or spill fuel at any attitude with or without the engine running. The number of venturis cannot exceed the number of cylinders. No slide-type carburetors. Aftermarket primer may be used. Intake manifold assembly may be modified or aftermarket. Aftermarket crankcase-pressure-operated fuel pumps may be used. Additional carburetor pulse line fittings may be installed on the crankcase.

25.7.2 **Fuel System:** The entire fuel system is a closed system. The watercraft must not vent or spill fuel at any attitude with or without the engine running. Original equipment fuel tank, fuel filler and relief valve must be used and cannot be modified. The fuel pickup, fuel filter and fuel petcock assembly may be removed and/or after-market parts may be used. Additional fuel filters may be used and fuel cell foam may be added to the original equipment fuel tank. Fuel tank filler cap may be modified or aftermarket provided a hazard is not created.

25.7.3 **Vapor Separators:** Vapor/Air Separators may be modified or aftermarket provided they do not exceed 2 inch x 6 inch and must have a return line to the fuel tank open at all times. Additional fuel reservoirs may not be used.

25.7.4 **Fuel Pumps:** Aftermarket or modified electric fuel pumps, not exceeding 4psi, may be used. When the engine stops or is shut off, the fuel pump must automatically stop. No manually operated on/off-type fuel pumps are allowed.

25.7.5 **Fuel Injection Systems:** Aftermarket fuel injection systems and components are allowed provided the following regulations are adhered to: High-pressure fuel hose meeting SAE J30R9 must be used; A.N. threaded-type fittings or equivalent and non-removable, crimped-type clamps must be used on the high-pressure portion of the system (i.e., hose clamps, tie wraps, etc. are not allowed); only metal-type fuel filters may be used on the high-pressure portion of the system; all other in-line filters must be installed on the low-pressure portion of the system.

25.7.6 **Flame Arrestor:** Flame arrestor(s) which satisfy United States Coast Guard, SAE-J1928 Marine or UL-1 111 Marine backfire flame arrestor test standards must be installed. Aftermarket flame arrestors satisfying one of these test standards will be allowed. Intake silencer may be removed. Flame arrestor mesh can not be removed or modified. Pre-filter flame arrestor covers are allowed.

25.7.7 **Reed and Rotary Valves:** Reed valve assemblies may be modified or aftermarket. Rotary valve may be modified or aftermarket.

25.8 IGNITION AND ELECTRONICS - TWO-STROKE

25.8.1 **Ignition:** RPM limiter function may be bypassed or eliminated. CDI unit may be modified or aftermarket. Ignition timing may be changed. Modifications to the original equipment ignition pickup mount will be allowed. Original equipment charging system must be used. No other ignition system modifications will be allowed.

25.8.2 **Flywheel Cover:** Flywheel cover may be modified to accept a crankshaft-end bearing support.

- 25.8.3 **Engine Temperature Sensor:** Engine temperature sensor may be disconnected and/or removed.
- 25.8.4 **Relocation of Battery Box:** Relocation of the battery box is allowed in order to fit an aftermarket exhaust system provided the relocated battery box and battery are securely fastened.
- 25.8.5 **Relocation of Electrical Components:** Relocation of electrical components (e.g., box or housing) is allowed in order to fit an aftermarket exhaust system (only the strict minimum needed). Modification will be subject to the Technical Directors' approval.

25.9 DRIVELINE

- 25.9.1 **Pump Assembly:** Impeller housing, stator vane assembly, pump mounting plate and/or pump shoe may be modified or aftermarket. No titanium driveshaft, impeller housing or stator vane assemblies. Impeller may be modified or aftermarket. Additional cooling fittings may be installed. Visibility spout must be removed or plugged. Silicone adhesive sealant may be used in addition to original equipment seal to seal pump inlet. Couplers, bearing housing and driveshaft may be modified or aftermarket provided they maintain a 1:1 drive ratio between the engine and the pump.
- 25.9.2 **Pump Nozzle:** Pump nozzle and directional nozzle may be modified or aftermarket. Overall length of the complete pump and nozzle assembly may be no more than 50.00mm (1.97 in.) longer than original equipment.
- 25.9.3 **Aftermarket Trim Systems:** Aftermarket trim-nozzle systems may be used.

25.10 LIMITED CLASS SUMMARY

25.10.1 The items listed below need not be OEM for participation in the Limited classes. See specific class rules for more details and specifications.

- 1) Engine Gaskets
- 2) Flywheel Key
- 3) Engine Mounts
- 4) Ignition or ECU
- 5) Fuel Filter, Fuel Hose
- 6) Control Cables and Housings
- 7) Carburetor Pivot Arm
- 8) Throttle Lever, Handlebars, Grips
- 9) Handlepole mounting bracket, bushings, spring or spring helper
- 10) Coupler Dampers
- 11) Coupler Shroud
- 12) Pump Bearings
- 13) Engine and Pump Seals
- 14) Battery
- 15) Mats, Decals, Hood Seal
- 16) Bond Rails
- 17) Flame Arrestors
- 18) Impeller
- 19) Rideplate

- 20) Intake Grate
- 21) Cylinder Head
- 24) Exhaust System
- 25) Carburetors
- 26) Seats on Runabout/Sport models
- 27) Bilge systems
- 28) Engine compartment foam
- 29) Pistons
- 30) Cooling System lines and fittings
- 31) Reed valve assemblies
- 32) Pump assembly
- 33) Air/Fuel Delivery System

25.11

COMMON REASONS FOR DISQUALIFICATION – LIMITED

25.11.1 The following is a list of common reasons for disqualification in the Stock class; this listing is not necessary a complete list of all reasons that a rider/PWC may be disqualified, but include the most common reasons.

- 1) Missing tow loop
- 2) Cylinder ports have been modified beyond tolerable limits.
- 3) Cylinder sleeve modifications.
- 4) Case decking.
- 5) Rod length changes.
- 6) Flame arrestor mesh has been removed or modified.
- 7) Aftermarket or lightened flywheel.
- 8) No rubber nose bumper.
- 9) Additional hull or hood ventilation for increased airflow to engine.
- 10) Engine gaskets beyond tolerable limits as specified.
- 11) Sponson length/depth exceeds specifications in rulebook.
- 12) Intake grate depth has been exceeded beyond rule book specs.
- 13) Rideplate length exceeds rule book specs.
- 14) Modifications to the waterbox.
- 15) Hull modifications.
- 16) **ADDED OR MODIFIED AIR INTAKES/VENTING**

HYDRO VINTAGE CLASS - The Hydro Vintage class will include all runabout personal watercraft produced in model year 1997 and prior. **The Hydro Vintage class will adhere to all MODIFIED RUNABOUT CLASS technical rules outlined in the 2009 APBA rule book in regard to runabouts.** EXCEPTION: displacement is capped at 1199cc. All other mod rules apply.

RULE 26 - TECHNICAL RULES – OPEN/MODIFIED CLASS

HYDRO VINTAGE (1997 and older runabout PWC)

26.1 OVERVIEW

26.1.1 Open Classes are intended to promote the highest level of modification, handling, control and speed in the sport of personal watercraft racing. Watercraft competing in this class must conform to the specifications which follow. All watercraft must remain strictly stock except where rules allow or require substitutions or modifications. Changes or modifications not listed here are not permitted. Original equipment parts may be updated or backdated to original equipment parts of the same model. The part must be a bolt-on type part requiring no modifications to that part or any other parts except where rules allow substitutions or modifications. The rules and regulations below are in addition to all General Technical rules listed in Rule 23.

26.2 SEATS

26.2.1 **Seats - Sport and Runabout Division Only:** Seat assembly may be modified or aftermarket. The seat cover and padding may be changed. Seat height may be changed.

26.3 HULL

26.3.1 **Hull and Deck Repairs:** Hull and deck repairs may be made. However, these repairs must not alter the standard configuration by more than 2.00mm (0.08 in.). Hull, bulkhead and deck may be internally reinforced. Fasteners may be installed through the hull, bulkhead and deck for the purposes of securing components to interior surfaces, provided a hazard is not created. Other than for the use of fasteners, the bulkhead may not be modified. Glue squeeze-out may be removed from the hull.

26.3.2 **Trim Tabs:** Aftermarket trim tabs, either fixed, automatic and/or rider controlled, may be used. Original equipment trim plates that are detachable from the hull may be removed or replaced when installing aftermarket trim tabs. Trim tabs cannot exceed the width of the planing surface or extend rearward more than 100mm (3.94 in.) beyond the end of the original planing surface.

26.3.3 **Hull Extensions:** All hull extensions mounted on the hull's transom will be considered as a trim tab. All edges must be radiused so as not to create a hazard. Fins, skegs, rudders and other appendages that may create a hazard are not allowed.

26.4 AFTERMARKET OR MODIFIED HULLS

26.4.1 **Aftermarket Hull Classes:** The following rules apply to the Expert Runabout Open and Pro-Am Runabout Open classes only. All other classes must run a stock OEM hull.

26.4.2 **Hull:** The hull may be modified or aftermarket but cannot exceed the length or width of the original equipment upper deck component of the bond flange as measured by a plumb bob (bumpers removed). Fins, rudders, skegs and other appendages that may create a hazard are not allowed.

- 26.4.3 **Deck:** Original equipment deck must be used. Deck repairs may be made, provided they do not alter the standard configuration by more than 2.00mm (0.08 in.). The deck's bond flange may not be modified. Deck may be internally reinforced.
- 26.4.4 **Weight Requirements:** At all times, the watercraft must weigh no less than 10 percent under the watercraft's original dry weight as determined by the APBA Technical Committee, providing the following:
- Includes fuel and oil.
 - Includes the water in the waterbox, so long as the waterbox is not deemed to be out of ordinary in volume.
 - Includes the battery.
 - All reasonable amount of water must be removed from all compartments.
 - For a list of published weights and the method of computing the minimum weight see Addendum E.
- 26.4.5 **Fasteners:** Fasteners may be installed through the hull and deck for the purpose of securing components to interior surfaces, provided that a hazard is not created.
- 26.4.6 **Rejoining Hull Components:** If upper and lower components of the original equipment bond flange are separated and rejoined, they must be rejoined by the same method as original equipment (i.e., bonded together with a high-strength adhesive).
- 26.4.7 **Engine Compartment Foam:** Engine compartment foam may be removed, modified or aftermarket. Only floatation foam within the engine compartment may be removed. Only foam that can be removed without modification to any other part or parts, except where rules allow the parts to be modified, is allowed. Parts may not be relocated based on the removal of the foam. The hull's inner liner or deck may not be cut or modified to remove foam. Removal of foam between layers of the hull and/or deck is not allowed.
- 26.4.9 **Hood Covers/Gauges/Mirrors and Handles:** Storage covers, hatches, instrument cowlings and engine covers may be modified or aftermarket provided a hazard is not created and the OEM appearance is maintained. Additional engine compartment ventilation is allowed. Original equipment vents may be shielded or plugged. Handles, drop-in type storage buckets and bolt-on type mirrors may be modified, aftermarket or removed provided a hazard is not created.
- 26.4.10 **Ballast Weight:** Ballast weight may be added prior to competition to meet the required weight limit. Ballast weight may be added within the normally exposed areas of the hull to alter the handling of the watercraft provided a hazard is not created. Only weight consisting of constant mass (i.e., water or other fluid is not allowed) that does not require the modification or relocation of any parts will be allowed unless such modification or relocation is specified by other rules.

26.5 ENGINE - TWO-STROKE

- 26.5.1 **Engines:** Engines may be bored. Aftermarket piston assemblies are allowed. The number, type, and placement of rings on piston may be changed.
- 26.5.2 **Engine Displacement:** Engine displacement must not exceed class designation. **Exception** – Maximum allowable cc over class designation may not exceed 850cc for all Open Ski classes.
- 26.5.3 **Crankcase:** Original equipment crankcase must be used. Internal modifications to the fuel, oil and/or water-exposed surfaces are allowed. Filler material may be added to hollow pockets in the base gasket areas. Base gasket and intake surfaces may be machined. Additional carburetor pulse line fittings may be installed. Bearing and seal surfaces may not be modified. Crankcase

drain system may be removed and plugged. Repairs to cracked or punctured crankcases may be made provided only one damaged area affecting one cylinder bank has been repaired. No other external modifications or external repairs are allowed.

- 26.5.4 **Crankshaft:** Crankshaft assembly may be modified or aftermarket. Stroke and rod length may be modified.
- 26.5.5 **Engine Balancing Assemblies:** Engine balancing assemblies may be modified, aftermarket, or removed.
- 26.5.6 **Cylinders:** Cylinders may be interchanged between watercraft of the same manufacturer. Any modifications to the cylinder or crankcase must be approved, in writing, by the APBA. Base gasket, head gasket and exhaust manifold gasket surfaces may be machined. Port heights, widths and shapes may be changed. Ports may be added or deleted from cylinder. Cylinders may be machined to accept after-market cylinder liners. Epoxy-type filler material may be added to hollow pockets in the base gasket areas and in the port area. Repairs to cracked or damaged cylinders may be made provided only one damaged area affecting one cylinder bank has been repaired. Cylinders may be machined to accept girdle-type cylinder heads. Water cooling fittings may be added to cylinder. Exhaust power valve components and means of actuation may be modified or aftermarket.
- 26.5.7 **Cylinder Head:** Cylinder head may be modified or aftermarket.
- 26.5.8 **Gaskets:** Engine gaskets may be modified or aftermarket.
- 26.5.9 **Exhaust System:** Exhaust system (i.e., manifold, head pipe, expansion chamber, waterbox, muffler(s), etc.) may be modified or aftermarket. Through-hull exhaust may be modified or aftermarket, provided that a hazard is not created. The exit location of the exhaust gases may be relocated to the transom below the bond flange. No tuned portion of the exhaust system shall protrude outside the hull.
- 26.5.10 **Cooling System:** Cooling system may be modified or aftermarket. Aftermarket cooling lines and water bypass systems may be used. Bypass fittings may be modified, aftermarket and/or relocated but must be directed downward and/or rearward so as not to create a hazard for other riders. Any valves used within the entire cooling system must be of the fixed type or automatic (e.g., thermostats, pressure regulators, solenoids, etc.). Manually controlled devices (by any means of actuation) that alter the flow of cooling water during operation are not allowed. Cooling system flush kits are allowed.

26.7 AIR/FUEL DELIVERY - TWO-STROKE

- 26.7.1 **Carburetors:** Carburetor(s) may be modified or aftermarket provided they do not vent or spill fuel at any attitude with or without the engine running. The number of venturis cannot exceed the number of cylinders. No slide-type carburetors are allowed. Aftermarket primer may be used. Intake manifold assembly may be modified or aftermarket. Aftermarket crankcase pressure operated fuel pumps may be used.
- 26.7.2 **Fuel System:** The entire fuel system is a closed system. The watercraft must not vent or spill fuel at any attitude with or without the engine running. Original equipment fuel tank, fuel filler, and relief valve must be used and cannot be modified. The fuel pickup, fuel filter, and fuel petcock may be removed and/or aftermarket. Additional fuel filters may be used and fuel cell foam may be added to the original equipment fuel tank. Fuel tank filler cap may be modified or aftermarket.
- 26.7.3 **Vapor Separators:** Modified or aftermarket vapor/air separators must not exceed 2 in. x 6 in., and must have a return line to the fuel tank open at all times. Additional fuel reservoirs may not be used.

- 26.7.4 **Fuel Pumps:** Aftermarket or modified electric fuel pumps, not exceeding 4psi, may be used. When the engine is shut off or stops, the fuel pump must automatically stop. No manually operated on/off-type fuel pumps are allowed.
- 26.7.5 **Fuel Injection Systems:** Aftermarket fuel injection systems and components are allowed provided the following regulations are adhered to: High-pressure fuel hose meeting SAE J30R9 must be used; A.N. threaded-type fittings or equivalent and non-removable, crimped-type clamps must be used on the high-pressure portion of the system (i.e., hose clamps, zip ties, etc. are not acceptable); only metal-type fuel filters may be used on the high-pressure portion of the system; all other in-line filters must be installed on the low-pressure portion of the system.
- 26.7.6 **Flame Arresters:** Flame arrester(s) which satisfy United States Coast Guard, SAE-J1928 Marine or UL-1 111 Marine backfire flame arrester test standards must be installed. Aftermarket flame arresters satisfying one of these test standards are allowed. Intake silencer may be removed. Flame arrester mesh can not be removed or modified. Pre-filter flame arrester covers are allowed.
- 26.7.7 **Reed and Rotary Valves:** Reed valve assemblies may be modified or aftermarket. Rotary valve may be modified or aftermarket.

26.9 IGNITION AND ELECTRONICS - TWO AND FOUR-STROKE

- 26.9.1 **Electrical and Charging System:** Ignition system, electrical box, flywheel and flywheel cover may be modified or aftermarket. Battery charging circuit may be disabled and/or removed.
- 26.9.2 **Relocation of Electrical Components:** Relocation of electrical components (e.g., box or housing) is allowed in order to fit an aftermarket exhaust system (only the strict minimum needed). Modification will be subject to the Technical Directors' approval.
- 26.9.3 **Relocation of Battery Box:** Relocation of the battery box is allowed in order to fit an aftermarket exhaust system provided the relocated battery box and battery are securely fastened.
- 26.9.4 **Temperature Sensor:** Engine temperature sensor assembly may be disconnected and/or removed.

26.10 TURBOCHARGER/SUPERCHARGER

- 26.10.1 **Modified and Aftermarket Turbo/Superchargers:** Aftermarket turbochargers and superchargers may be used provided a hazard is not created. Original turbocharger or supercharger may be modified. Aftermarket turbochargers and superchargers may be added to originally normally aspirated watercraft. Turbocharger housing must be of the full circulating, water-jacket type at all times when the engine is running. All hoses and pipes may be modified or aftermarket.

26.11 DRIVELINE AND PUMP

- 26.11.1 **Pump:** Impeller, impeller housing, stator vane assembly, pump mounting plate and/or pump shoe may be modified or aftermarket. Additional cooling fittings may be installed. Visibility spout must be removed or plugged. Silicone adhesive sealant may be used in addition to original equipment seal to seal pump inlet.
- 26.11.2 **Pump Nozzle:** Pump nozzle and directional nozzle may be modified or aftermarket. Overall length of the complete pump and nozzle assembly may be no more than 50.00mm (1.97 in.) longer than original equipment.
- 26.11.3 **Trim System:** Aftermarket nozzle trim systems may be used.

26.11.4 **Driveline & Components:** Couplers, bearing housing and driveshaft may be modified or aftermarket provided they maintain a 1:1 drive ratio between the engine and the pump.

26.12 OPEN CLASS SUMMARY

26.12.1 The following items need not be OEM for participation in the Open Class:

- 1) Engine Gaskets
- 2) Flywheel Key
- 3) Engine Mounts
- 4) Ignition or ECU
- 5) Fuel Filter, Fuel Hose
- 6) Control Cables and Housings
- 7) Carburetor Pivot Arm
- 8) Throttle Lever, Handlebars, Grips
- 9) Handlepole mounting bracket, bushings, spring or spring helper
- 10) Coupler Dampers
- 11) Coupler Shroud
- 12) Pump Bearings
- 13) Engine and Pump Seals
- 14) Battery
- 15) Mats, Decals, Hood Seal
- 16) Bond Rails
- 17) Flame Arrestors
- 18) Impeller
- 19) Rideplate
- 20) Intake Grate
- 21) Cylinder Head
- 22) Exhaust System
- 23) Carburetors
- 24) Seats on Runabout/Sport models
- 25) Bilge systems
- 26) Engine compartment foam
- 27) Pistons
- 28) Cooling System lines and fittings
- 29) Reed valve assemblies
- 30) Pump assembly

26.13

COMMON REASONS FOR DISQUALIFICATION – OPEN

26.13.1 The following is a list of common reasons for disqualification in the Open class; this listing is not necessary a complete one.

- 1) Missing tow strap
- 2) Upper deck modifications.
- 3) Illegal hull modifications (inlet duct area main problem).

- 4) Bulk head modifications.
- 5) Watercraft weight less than allowed.
- 6) Displacement over the cc limit in rulebook.

RULE 27 - TECHNICAL RULES – MODIFIED CLASSES

27.1 OVERVIEW

27.1.1 Modified class competitors are allowed modifications to gain maximum machine and engine performance. Watercraft competing in a Modified class are allowed all Open class modifications listed in Rule 26 plus the additional specifications which follow.

27.3 SEATS

27.3.1 **Sport and Runabout Division Only:** Seat assembly may be modified or aftermarket. The seat cover and padding may be changed. Seat height may be changed.

27.4 HULL

27.4.1 Hull may be modified or aftermarket but cannot exceed the length or width of the original equipment upper deck component of the bond flange as measured by a plumb bob (bumpers removed). Fins, rudders, skegs and other appendages that may create a hazard will not be allowed.

27.5 ENGINE

27.5.1 **Pistons and Rings:** Engines may be bored. Aftermarket piston assemblies are allowed. Engine displacement must not exceed class designation (e.g., 800cc in Sport 800 Modified, etc.). The number, type, and placement of rings on piston may be changed.

27.5.2 **Crankcases:** Crankcases may be interchanged between homologated watercraft of the same manufacturer. Crankcases must be of the same type (i.e., cylinder induction, crankcase induction or rotary valve induction) and number of cylinders as original equipment (no adding or deleting cylinders). Internal modifications to the fuel, oil and/or water exposed surfaces are allowed. Bearing and seal surfaces may not be modified. Filler material may be added to hollow pockets in the base gasket areas. Ignition/stator mounting area modifications are limited to spot facing, drilling and tapping threads for the purpose of mounting an after-market or modified ignition system. Additional carburetor pulse line fittings may be installed. Crankcase drain system may be removed or plugged. Additional mounting holes, not to exceed 10.00mm (0.40 in.) diameter, are allowed provided they do not penetrate the internal surface of the cases. Base gasket and intake surfaces may be machined. Repairs to cracked or punctured crankcases may be made provided only one damaged area affecting one cylinder bank has been repaired. External modifications to the crankcase finish (e.g., plating, polishing and/or painting) are allowed for cosmetic purposes only. No other external modifications or external repairs will be allowed.

27.5.3 **Cylinder:** Cylinder and cylinder head may be modified or aftermarket.

27.5.4 **Crankshaft Assembly:** Crankshaft assembly may be modified or aftermarket. Stroke and rod length may be changed.

27.5.5 **Motor Mounts:** Engine bed and motor mounts may be modified or aftermarket. Engine may be repositioned in the hull.

27.6 IGNITION AND ELECTRONICS

- 27.6.1 **Ignition System:** Ignition system, electrical box, flywheel and flywheel cover may be modified or aftermarket. Battery charging circuit may be disabled and/or removed.
- 27.6.2 **Battery:** An additional battery and battery box may be used. Batteries must fit into a proper battery box and be securely fastened. Batteries may be relocated.

HYDRO UNLIMITED CLASS – Designed to be the Premier Drag Racing class of the personal watercraft world, the Hydro Unlimited class allows the greatest amount of modifications, innovative, creative engineering, and fabrication. **The Hydro Unlimited class will adhere to all MODIFIED RUNABOUT CLASS technical rules outlined in the 2009 APBA rule book (viewable at www.apbaracing.com) in regard to runabouts with the following EXCEPTIONS;**

UNLIMITED CLASS RULE EXCEPTIONS:

1. No minimum weight requirements
2. Hull's planning surface may exceed from transom bond line as defined by plum bob method, up to, but not exceeding 25 mm (ride plate may extend 5mm beyond this point, but only if transom has been extended.) No exception on bow area, port, or starboard bond lines. No skegs, rudders, or fins are allowed
3. Top deck may be modified or aftermarket while maintaining original OEM design, configuration, appearance, and proportions from OEM specs for that particular APBA Homologated model.
4. Steering system may be relocated but must retain handlebar system with throttle, and engine cut-off (lanyard) system attached to handlebars.
5. Nitrous Oxide Boosting permitted, with respect to ALL "fuel induction" and "safety" rules outlined by the APBA rule book being in FULL affect.
6. Top Deck and Hull) can use any kind of composite materials
- 7. (Participant) can use any kind of unleaded fuel burning combustion engines but it MUST BE BASED ON A APBA HOMOLOGATED RUNABOUT ENGINE**
8. Full modifications are allowed (crankshaft, cylinders, pistons, crankcases, valves, lifters, heads and exhaust)
9. Four-cylinders maximum.
10. Transmission and pump are free to full modification but must stay "inboard" or "internal" and must utilize a water jet pump/impeller type of propulsion.

RULE 26 - TECHNICAL RULES – HYDRO UNLIMITED CLASS

26.1 OVERVIEW

- 26.1.1 Unlimited class is based off of the Open class rules with the addition of the Modified class opportunities and above exceptions. Open Classes are intended to promote the highest level of modification, handling, control and speed in the sport of personal watercraft racing. Watercraft competing in this class must conform to the specifications which follow. All watercraft must remain strictly stock except where rules allow or require substitutions or modifications. Changes or modifications not listed here are not permitted. Original equipment parts may be updated or backdated to original equipment parts of the same model. The part must be a bolt-on type part requiring no modifications to that part or any other parts except where rules allow substitutions or modifications. The rules and regulations below are in additional to all General Technical rules listed in Rule 23.
- 26.1.2 **Legal Updates:** Yamaha SuperJets produced prior to 1996 may update to 1996 and newer engine components. Kawasaki JS750SX and SXi may update to SXi Pro engine components.

26.2 SEATS

- 26.2.1 **Seats - Sport and Runabout Division Only:** Seat assembly may be modified or aftermarket. The seat cover and padding may be changed. Seat height may be changed.

26.3 HULL

- 26.3.1 **Hull and Deck Repairs:** Hull and deck repairs may be made. However, these repairs must not alter the standard configuration by more than 2.00mm (0.08 in.). Hull, bulkhead and deck may be internally reinforced. Fasteners may be installed through the hull, bulkhead and deck for the purposes of securing components to interior surfaces, provided a hazard is not created. Other than for the use of fasteners, the bulkhead may not be modified. Glue squeeze-out may be removed from the hull.
- 26.3.2 **Trim Tabs:** Aftermarket trim tabs, either fixed, automatic and/or rider controlled, may be used. Original equipment trim plates that are detachable from the hull may be removed or replaced when installing aftermarket trim tabs. Trim tabs cannot exceed the width of the planing surface or extend rearward more than 100mm (3.94 in.) beyond the end of the original planing surface.
- 26.3.3 **Hull Extensions:** All hull extensions mounted on the hull's transom will be considered as a trim tab. All edges must be radiused so as not to create a hazard. Fins, skegs, rudders and other appendages that may create a hazard are not allowed.

26.4 AFTERMARKET OR MODIFIED HULLS

- 26.4.1 **Aftermarket Hull Classes:** The following rules apply to the Expert Runabout Open and Pro-Am Runabout Open classes only. All other classes must run a stock OEM hull.
- 26.4.2 **Hull:** The hull may be modified or aftermarket but cannot exceed the length or width of the original equipment upper deck component of the bond flange as measured by a plumb bob (bumpers removed). Fins, rudders, skegs and other appendages that may create a hazard are not allowed.
- 26.4.3 **Deck:** Original equipment deck must be used. Deck repairs may be made, provided they do not alter the standard configuration by more than 2.00mm (0.08 in.). The deck's bond flange may not be modified. Deck may be internally reinforced.
- 26.4.4 ~~**Weight Requirements:** At all times, the watercraft must weigh no less than 10 percent under the watercraft's original dry weight as determined by the APBA Technical Committee, providing the following:~~
- ~~• Includes fuel and oil.~~
 - ~~• Includes the water in the waterbox, so long as the waterbox is not deemed to be out of ordinary in volume.~~
 - ~~• Includes the battery.~~
 - ~~• All reasonable amount of water must be removed from all compartments.~~
 - ~~• For a list of published weights and the method of computing the minimum weight see Addendum E.~~
- 26.4.5 **Fasteners:** Fasteners may be installed through the hull and deck for the purpose of securing components to interior surfaces, provided that a hazard is not created.
- 26.4.6 **Rejoining Hull Components:** If upper and lower components of the original equipment bond flange are separated and rejoined, they must be rejoined by the same method as original equipment (i.e., bonded together with a high-strength adhesive).
- 26.4.7 **Engine Compartment Foam:** Engine compartment foam may be removed, modified or aftermarket. Only floatation foam within the engine compartment may be removed. Only foam

that can be removed without modification to any other part or parts, except where rules allow the parts to be modified, is allowed. Parts may not be relocated based on the removal of the foam. The hull's inner liner or deck may not be cut or modified to remove foam. Removal of foam between layers of the hull and/or deck is not allowed.

- 26.4.9 **Hood Covers/Gauges/Mirrors and Handles:** Storage covers, hatches, instrument cowlings and engine covers may be modified or aftermarket provided a hazard is not created and the OEM appearance is maintained. Additional engine compartment ventilation is allowed. Original equipment vents may be shielded or plugged. Handles, drop-in type storage buckets and bolt-on type mirrors may be modified, aftermarket or removed provided a hazard is not created.
- 26.4.10 **Ballast Weight:** Ballast weight may be added prior to competition to meet the required weight limit. Ballast weight may be added within the normally exposed areas of the hull to alter the handling of the watercraft provided a hazard is not created. Only weight consisting of constant mass (i.e., water or other fluid is not allowed) that does not require the modification or relocation of any parts will be allowed unless such modification or relocation is specified by other rules.

26.5 ENGINE - TWO-STROKE

- 26.5.1 **Engines:** Engines may be bored. Aftermarket piston assemblies are allowed. The number, type, and placement of rings on piston may be changed.
- 26.5.2 **Engine Displacement:** Engine displacement must not exceed class designation. **Exception –** Maximum allowable cc over class designation may not exceed 850cc for all Open Ski classes.
- 26.5.3 **Crankcase:** Original equipment crankcase must be used. Internal modifications to the fuel, oil and/or water-exposed surfaces are allowed. Filler material may be added to hollow pockets in the base gasket areas. Base gasket and intake surfaces may be machined. Additional carburetor pulse line fittings may be installed. Bearing and seal surfaces may not be modified. Crankcase drain system may be removed and plugged. Repairs to cracked or punctured crankcases may be made provided only one damaged area affecting one cylinder bank has been repaired. No other external modifications or external repairs are allowed.
- 26.5.4 **Crankshaft:** Crankshaft assembly may be modified or aftermarket. Stroke and rod length may be modified.
- 26.5.5 **Engine Balancing Assemblies:** Engine balancing assemblies may be modified, aftermarket, or removed.
- 26.5.6 **Cylinders:** Cylinders may be interchanged between watercraft of the same manufacturer. Any modifications to the cylinder or crankcase must be approved, in writing, by the APBA. Base gasket, head gasket and exhaust manifold gasket surfaces may be machined. Port heights, widths and shapes may be changed. Ports may be added or deleted from cylinder. Cylinders may be machined to accept after-market cylinder liners. Epoxy-type filler material may be added to hollow pockets in the base gasket areas and in the port area. Repairs to cracked or damaged cylinders may be made provided only one damaged area affecting one cylinder bank has been repaired. Cylinders may be machined to accept girdle-type cylinder heads. Water cooling fittings may be added to cylinder. Exhaust power valve components and means of actuation may be modified or aftermarket.
- 26.5.7 **Cylinder Head:** Cylinder head may be modified or aftermarket.
- 26.5.8 **Gaskets:** Engine gaskets may be modified or aftermarket.
- 26.5.9 **Exhaust System:** Exhaust system (i.e., manifold, head pipe, expansion chamber, waterbox, muffler(s), etc.) may be modified or aftermarket. Through-hull exhaust may be modified or

aftermarket, provided that a hazard is not created. The exit location of the exhaust gases may be relocated to the transom below the bond flange. No tuned portion of the exhaust system shall protrude outside the hull.

26.5.10 **Cooling System:** Cooling system may be modified or aftermarket. Aftermarket cooling lines and water bypass systems may be used. Bypass fittings may be modified, aftermarket and/or relocated but must be directed downward and/or rearward so as not to create a hazard for other riders. Any valves used within the entire cooling system must be of the fixed type or automatic (e.g., thermostats, pressure regulators, solenoids, etc.). Manually controlled devices (by any means of actuation) that alter the flow of cooling water during operation are not allowed. Cooling system flush kits are allowed.

26.6 ENGINE - FOUR-STROKE

26.6.1 **Engine Block:** Original engine block must be used. Internal modifications to the oil and/or water-exposed surfaces will be allowed. The head gasket surface of the cylinder block may be machined.

26.6.2 **Cylinder Head:** Cylinder head may be modified or aftermarket. Intake and exhaust runners may be modified. Material may be added to the runners. Intake and exhaust ports may be modified. Port diameters and shapes may be changed. Combustion chambers may be modified. Material may be added to the combustion chamber. The original number of intake and exhaust valves must be the same as original. Repairs to the cylinder head affecting one cylinder bank are allowed. The head gasket surface may be machined.

26.6.3 **Valvetrain and Components:** Aftermarket valvetrain components are allowed provided the original method of activation is maintained (e.g., if originally activated by a camshaft, they may not convert to solenoid activation). Valves may be shimmed with OEM or aftermarket shims. Valve springs may be modified or aftermarket. Camshaft(s) may be aftermarket. The number of camshafts must be the same as original. Original bearing type and dimensions must be used. Cam timing may be changed. Cam gears, tensioners, chain or belt may be modified or aftermarket.

26.6.4 **Engine:** Engines may be bored. Aftermarket piston assemblies are allowed. Engine displacement must not exceed class designation (e.g., 1300cc in Pro-Am Run Open, 2000cc for 4-Stroke Open, etc.).

26.6.5 **Engine Displacement Open Ski Classes:** For all Open Ski classes the displacement must not exceed 800cc for four-stroke watercraft.

26.6.6 **Crankshaft:** Crankshaft may be modified or aftermarket. Stroke must remain the same as original. Total weight of the crankshaft must be within +/-5.00% of the original equipment weight. Replacement bearings or bearing shells are allowed provided that they maintain their original type and dimensions.

26.6.7 **Engine Balancing Assemblies:** Engine balancing assemblies may be modified, aftermarket or removed.

26.6.8 **Rods:** Aftermarket connecting rods made of ferrous materials are allowed. Rod length may be changed.

26.6.9 **Exhaust System:** Exhaust system (i.e., manifold, connecting pipes, hoses, muffler(s), etc.) may be modified or aftermarket. Through-hull exhaust may be modified or aftermarket, provided that a hazard is not created. No tuned portion of the exhaust system may protrude outside of the hull. Exit location of the exhaust gases may be relocated to the transom below the bond flange of the boat.

26.6.10 **Cooling System:** The cooling system may be modified or aftermarket and additional cooling lines may be added. Aftermarket water bypass systems may be used. Cooling system bypass

fittings may be modified or aftermarket and/or relocated, however, if relocated, the fittings must be directed downward and/or rearward so as not to create a hazard for other riders. Any valves that are used within the entire cooling system must be of the fixed type or automatic (e.g., thermostats, pressure regulators, solenoids, etc.). Manually controlled devices (by means of actuation) that alter the flow of cooling water during operation are not allowed. Original cooling system thermostat may be removed, modified or aftermarket. Cooling system flush kits are allowed.

26.6.11 **Oil Reservoir and Oil Pump:** Baffles in the oil reservoir may be modified. The addition of baffles in oil reservoir is allowed. Oil pump may be modified or aftermarket.

26.6.12 **Valve Cover:** The valve cover may be replaced for cosmetic purposes and/or weight reduction only.

26.7 AIR/FUEL DELIVERY - TWO-STROKE

26.7.1 **Carburetors:** Carburetor(s) may be modified or aftermarket provided they do not vent or spill fuel at any attitude with or without the engine running. The number of venturis cannot exceed the number of cylinders. No slide-type carburetors are allowed. Aftermarket primer may be used. Intake manifold assembly may be modified or aftermarket. Aftermarket crankcase pressure operated fuel pumps may be used.

26.7.2 **Fuel System:** The entire fuel system is a closed system. The watercraft must not vent or spill fuel at any attitude with or without the engine running. Original equipment fuel tank, fuel filler, and relief valve must be used and cannot be modified. The fuel pickup, fuel filter, and fuel petcock may be removed and/or aftermarket. Additional fuel filters may be used and fuel cell foam may be added to the original equipment fuel tank. Fuel tank filler cap may be modified or aftermarket.

26.7.3 **Vapor Separators:** Modified or aftermarket vapor/air separators must not exceed 2 in. x 6 in., and must have a return line to the fuel tank open at all times. Additional fuel reservoirs may not be used.

26.7.4 **Fuel Pumps:** Aftermarket or modified electric fuel pumps, not exceeding 4psi, may be used. When the engine is shut off or stops, the fuel pump must automatically stop. No manually operated on/off-type fuel pumps are allowed.

26.7.5 **Fuel Injection Systems:** Aftermarket fuel injection systems and components are allowed provided the following regulations are adhered to: High-pressure fuel hose meeting SAE J30R9 must be used; A.N. threaded-type fittings or equivalent and non-removable, crimped-type clamps must be used on the high-pressure portion of the system (i.e., hose clamps, zip ties, etc. are not acceptable); only metal-type fuel filters may be used on the high-pressure portion of the system; all other in-line filters must be installed on the low-pressure portion of the system.

26.7.6 **Flame Arresters:** Flame arrester(s) which satisfy United States Coast Guard, SAE-J1928 Marine or UL-1 111 Marine backfire flame arrester test standards must be installed. Aftermarket flame arresters satisfying one of these test standards are allowed. Intake silencer may be removed. Flame arrestor mesh can not be removed or modified. Pre-filter flame arrestor covers are allowed.

26.7.7 **Reed and Rotary Valves:** Reed valve assemblies may be modified or aftermarket. Rotary valve may be modified or aftermarket.

26.8 AIR/FUEL DELIVERY - FOUR-STROKE

26.8.1 **Fuel System:** The original fuel injectors may be modified to increase fuel-flow rate. Aftermarket fuel injectors that increase fuel flow are allowed provided they must not increase airflow into the combustion chamber. Fuel rail and fuel regulator may be modified or aftermarket. Additional fuel

injectors may be added. Aftermarket fuel pumps are allowed provided that when the engine is shut off or stops, the fuel pump must automatically stop. No manually operated on/off fuel pumps are allowed. High-pressure fuel hose meeting SAE J30R9 must be used; only metal-type fuel filters may be used on the high-pressure portion of the system; all other in-line filters must be installed on the low-pressure portion of the system.

26.8.2 **Flame Arresters:** Flame arresters that meet USCG, UL-1 111 or SAE J-1928 Marine standards must be used. Airflow sensor may be modified, aftermarket or removed. Ducting between the flame arrestor and throttle body may be modified or aftermarket. Flame arrestor mesh can not be removed or modified. Pre-filter flame arrestor covers are allowed.

26.8.3 **Throttle Body:** Throttle body may be modified or aftermarket. The number of butterflies may be increased but may not exceed the number of cylinders.

26.8.4 Intake Manifold: Intake manifold assembly may be modified or aftermarket.

26.8.5 Carburetor: Carburetor(s) may be modified or aftermarket provided they do not vent or spill fuel at any attitude with or without the engine running. Carburetors may be used in addition to or in place of the fuel injection system. The number of venturis cannot exceed the number of cylinders. No slide-type carburetors. Aftermarket primer may be used. Intake manifold assembly may be modified or aftermarket. Aftermarket air-pulse-pressure operated fuel pumps may be used.

26.9

IGNITION AND ELECTRONICS - TWO AND FOUR-STROKE

26.9.1 **Electrical and Charging System:** Ignition system, electrical box, flywheel and flywheel cover may be modified or aftermarket. Battery charging circuit may be disabled and/or removed.

26.9.2 **Relocation of Electrical Components:** Relocation of electrical components (e.g., box or housing) is allowed in order to fit an aftermarket exhaust system (only the strict minimum needed). Modification will be subject to the Technical Directors' approval.

26.9.3 **Relocation of Battery Box:** Relocation of the battery box is allowed in order to fit an aftermarket exhaust system provided the relocated battery box and battery are securely fastened.

26.9.4 **Temperature Sensor:** Engine temperature sensor assembly may be disconnected and/or removed.

26.10 TURBOCHARGER/SUPERCHARGER

26.10.1 **Modified and Aftermarket Turbo/Superchargers:** Aftermarket turbochargers and superchargers may be used provided a hazard is not created. Original turbocharger or supercharger may be modified. Aftermarket turbochargers and superchargers may be added to originally normally aspirated watercraft. Turbocharger housing must be of the full circulating, water-jacket type at all times when the engine is running. All hoses and pipes may be modified or aftermarket.

26.10.2 **Intercooler:** Intercooler may be modified or aftermarket.

26.10.3 **Boost Valve:** Boost pressure-relief valve may be modified or aftermarket

26.10.4 **Boost Sensor:** Boost sensor may be modified or aftermarket.

26.11 DRIVELINE AND PUMP

26.11.1 **Pump:** Impeller, impeller housing, stator vane assembly, pump mounting plate and/or pump shoe may be modified or aftermarket. Additional cooling fittings may be installed. Visibility spout

must be removed or plugged. Silicone adhesive sealant may be used in addition to original equipment seal to seal pump inlet.

26.11.2 **Pump Nozzle:** Pump nozzle and directional nozzle may be modified or aftermarket. Overall length of the complete pump and nozzle assembly may be no more than 50.00mm (1.97 in.) longer than original equipment.

26.11.3 **Trim System:** Aftermarket nozzle trim systems may be used.

26.11.4 **Driveline & Components:** Couplers, bearing housing and driveshaft may be modified or aftermarket provided they maintain a 1:1 drive ratio between the engine and the pump.

26.12 OPEN CLASS SUMMARY

26.12.1 The following items need not be OEM for participation in the Open Class:

- 1) Engine Gaskets
- 2) Flywheel Key
- 3) Engine Mounts
- 4) Ignition or ECU
- 5) Fuel Filter, Fuel Hose
- 6) Control Cables and Housings
- 7) Carburetor Pivot Arm
- 8) Throttle Lever, Handlebars, Grips
- 9) Handlepole mounting bracket, bushings, spring or spring helper
- 10) Coupler Dampers
- 11) Coupler Shroud
- 12) Pump Bearings
- 13) Engine and Pump Seals
- 14) Battery
- 15) Mats, Decals, Hood Seal
- 16) Bond Rails
- 17) Flame Arrestors
- 18) Impeller
- 19) Rideplate
- 20) Intake Grate
- 21) Cylinder Head
- 22) Exhaust System
- 23) Carburetors
- 24) Seats on Runabout/Sport models
- 25) Bilge systems
- 26) Engine compartment foam
- 27) Pistons
- 28) Cooling System lines and fittings
- 29) Reed valve assemblies
- 30) Pump assembly

26.13

COMMON REASONS FOR DISQUALIFICATION – OPEN

26.13.1 The following is a list of common reasons for disqualification in the Stock class; this listing is not necessary a complete list of all reasons that a rider/PWC may be disqualified, but include the most common reasons.

- 1) Missing tow strap.
- 2) Upper deck modifications – that significantly change the appearance in shape from the OEM design-.
- 3) Illegal hull modifications (inlet duct area main problem).
- 4) Bulk head modifications.
- 5) Displacement over the cc limit in rulebook.

RULE 27 - TECHNICAL RULES – MODIFIED CLASSES

27.1 OVERVIEW

27.1.1 Modified class competitors are allowed modifications to gain maximum machine and engine performance. Watercraft competing in a Modified class are allowed all Open class modifications listed in Rule 26 plus the additional specifications which follow.

27.3 SEATS

27.3.1 **Sport and Runabout Division Only:** Seat assembly may be modified or aftermarket. The seat cover and padding may be changed. Seat height may be changed.

27.4 HULL

27.4.1 Hull may be modified or aftermarket but cannot exceed the length or width of the original equipment upper deck component of the bond flange as measured by a plumb bob (bumpers removed). Fins, rudders, skegs and other appendages that may create a hazard will not be allowed.

27.5 ENGINE

27.5.1 **Pistons and Rings:** Engines may be bored. Aftermarket piston assemblies are allowed. Engine displacement must not exceed class designation (e.g., 800cc in Sport 800 Modified, etc.). The number, type, and placement of rings on piston may be changed.

27.5.2 **Crankcases:** Crankcases may be interchanged between homologated watercraft of the same manufacturer. Crankcases must be of the same type (i.e., cylinder induction, crankcase induction or rotary valve induction) and number of cylinders as original equipment (no adding or deleting cylinders). Internal modifications to the fuel, oil and/or water exposed surfaces are allowed. Bearing and seal surfaces may not be modified. Filler material may be added to hollow pockets in the base gasket areas. Ignition/stator mounting area modifications are limited to spot facing, drilling and tapping threads for the purpose of mounting an after-market or modified ignition system. Additional carburetor pulse line fittings may be installed. Crankcase drain system may be removed or plugged. Additional mounting holes, not to exceed 10.00mm (0.40 in.) diameter, are allowed provided they do not penetrate the internal surface of the cases. Base gasket and intake surfaces may be machined. Repairs to cracked or punctured crankcases may be made provided only one damaged area affecting one cylinder bank has been repaired. External modifications to the crankcase finish (e.g., plating, polishing and/or painting) are allowed for cosmetic purposes only. No other external modifications or external repairs will be allowed.

27.5.3 **Cylinder:** Cylinder and cylinder head may be modified or aftermarket.

27.5.4 **Crankshaft Assembly:** Crankshaft assembly may be modified or aftermarket. Stroke and rod length may be changed.

27.5.5 **Motor Mounts:** Engine bed and motor mounts may be modified or aftermarket. Engine may be repositioned in the hull.

27.6 IGNITION AND ELECTRONICS

27.6.1 **Ignition System:** Ignition system, electrical box, flywheel and flywheel cover may be modified or aftermarket. Battery charging circuit may be disabled and/or removed.

27.6.2 **Battery:** An additional battery and battery box may be used. Batteries must fit into a proper battery box and be securely fastened. Batteries may be relocated.

Competition Rules

All aspects of competition outlined in the 2009 APBA rule book will be adhered to.

FOR MORE INFORMATION ON THE COMPLETE RULES AS OUTLINED BY THE APBA PLEASE VISIT WWW.APBARACING.COM.

FOR MORE SPECIFIC INFORMATION ON THE HYDRODRAG EVENTS PLEASE CONTACT TIM MCKERCHER AT WATERTOP UNLIMITED AT 321.409.0519 or info@watertopunlimited.com.

