



2013 HYDRODRAG COMPETITION GUIDE:



THIS COMPETITION GUIDE IS A SUPPLEMENT TO THE IJSBA PWC RACING RULE BOOK TO COVER HYDRODRAG SPECIFIC RULES. PLEASE REVIEW THE IJSBA RULE BOOK FOR RULE CLARIFICATION AND DETAIL.

Membership

All aspects of competition outlined in the 2013 IJSBA rule book will be adhered to. EVERY PARTICIPANT IN THE HYDRODRAG NATIONALS AND WORLD FINALS IS ABSOLUTELY REQUIRED TO BE A CURRENT COMPETITION MEMBER OF THE IJSBA IN GOOD STANDING.

Sanctions

All aspects of competition outlined in the 2013 IJSBA rule book will be adhered to, except where superseded by the noted changes in this supplement.

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 800'-1000' - 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

Boat Numbering System

All aspects of competition outlined in the 2013 IJSBA rulebook 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 Super Stock: SS
- Hydro Spec: S
- Hydro Pro Stock: P
- Hydro Naturally Aspirated: NA

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

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 IJSBA 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 IJSBA numbers or designation at any time while at a sanctioned event, must wear complete safety equipment including helmet and life jacket at all times while on the water.
- 10.2.3 Helmets
- 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.
 - The only time a helmet is not required to be worn is during a Freestyle competition.
 - It is highly recommended that any helmet involved in an accident be returned to the appropriate manufacturer for inspection and repair, if necessary.
 - 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. See IJSBA rules for new full face shield allowances.
 - No plastic, bicycle type, BMX, or similar designed headgear will be allowed.
- 10.2.4 Life Jackets -
- 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.
 - Every rider shall certify his/her flotation equipment to function properly when requested by an IJSBA official.
 - 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 IJSBA 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 IJSBA 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, if 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.

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 and World Championship events the standard 1/8 mile (660ft) format should be used.

17.2 GENERAL SAFETY EQUIPMENT - DRAG RACING

17.2.1 **In addition to the IJSBA General Safety Rules outlined in Rule 10** 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 IJSBA 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.
- 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, at all times while practicing and/or racing. Shorty, spring, full neoprene wetsuits, and drysuits are also acceptable and recommended.

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 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. Seat base CAN NOT BE MODIFIED (no holes). Seat foam can be modified.

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:** The course length for all National and World Championship HydroDrag events shall be 660 feet (1/8th mile). Official IJSBA Drag Racing records will be set only at approved IJSBA 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 IJSBA sanctioned personal watercraft racing 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.

18.1 STARTING SYSTEM

18.1.2 **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 15" 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 HydroDrags will utilize a "LAUNCH PAD"; a mechanically operated bunk system where two watercraft will start side-by-side with engines 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 15" apart.

Participants will approach the Launch Pad without engines running and position their PWC onto the bunks with the bow of the craft lined up to be even with a marked line on the floating structure.

Each participant's bunk system will be raised with rider in position to the point where the craft's pump inlet is in the water and loaded with water when running. Each rider can give as much throttle as possible WITHOUT sliding off of their bunks, in which case would result in a false start. **Only one false start is permitted per heat before participant is deemed loser of that heat or final.**

The starter will stand at the front of the Launch Pad instructing racers to start their engines. After each participant gives the ready signal the starter can drop the Launch Pad bunks at anytime after to begin that race. Participants leave the Launch Pad maintaining a straight path 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 promoter.

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. 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 IJSBA prior to use in competition.

23.2 SOUND LEVEL – WAIVED FOR HYDRODRAG EVENTS

23.3 FUEL

23.3.1 **Naturally Aspirated, Pro Stock, Super Stock & Limited Classes:** Fuel must consist of **unleaded gasoline only**. For the purpose of this rulebook “unleaded gasoline” is defined as a mixture of hydrocarbons and oxygen bearing compounds with the following clarifications:

1. Oxygen content must not increase the specific energy of the gasoline.
2. Oxygen content must not exceed 3.7% by weight.
3. Oxygen content must have been blended in by the refiner or the fuel manufacturer.
4. Specific gravity must be between .715 & .770 at 60°F (15°C). E85 is permitted so long as it meets the specific gravity criteria.
5. The only allowable oxygenates are ethers and alcohols. Epoxides (example: propylene oxide) will not be considered ethers. Nitrogen bearing compounds are not allowed.

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

23.3.2 **Unlimited Class:** Fuel may consist of unleaded, including E85, and leaded gasoline. Nitros Oxide systems may be added.

23.3.3 **NITRO METHANE AND ALCOLHOL ARE PROHIBITED IN ALL CLASSES.**

23.3.4 **TESTING:** All competitors are subject to random fuel testing at any point during competition at the discretion of the race director or promoter. Refusal to submit a fuel sample will be considered and dealt with as if a sample were found to be illegal. If a sample is found to be illegal during a qualifying or elimination round that competitor will automatically and immediately be disqualified and the competition reinstated as the winner pending fuel testing. Winners of final overall rounds are required to submit fuel for testing immediately after competition. If a sample is found to be illegal that competitor will automatically and immediately be disqualified and the competition reinstated as the winner pending fuel testing.

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.

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.). – **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 IJSBA 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 – except in box stock class. The original diameter must be maintained in Stock classes.
- 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.
- 23.10.7 **Launching and Beaching:** The launch ramp is small. 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 CLASS RULES

HYDRO NA (Naturally Aspirated) CLASS - The Hydro NA class will include all PWC that are NOT supercharged, turbocharged or are intake boosted in any way. The Hydro NA class will adhere to the following technical rules outlined in the 2013 HydroDrag rule book in regard to runabouts with no exceptions.

RULE 24 - TECHNICAL RULES –NATURALLY ASPIRATED

4-STROKE: Will follow Pro Stock Class technical rules in regard to runabouts with no exceptions. See next section.

2-STROKE: Will follow Limited Class technical rules in regard to runabouts with no exceptions. See below.

24.1 LIMITED CLASS COMPETITION

Intended to promote interest in personal watercraft competition with a limited number of modifications, and to enable individuals to become active competitors with a relatively modest investment. Watercraft competing in this class must conform to the specifications which follow.

24.1.1 All watercraft must remain strictly stock (all Stock Class provisions are allowed in Limited Class unless otherwise noted), except where rules allow or require substitutions or modifications. Changes or modifications not listed here are not permitted. The IJSBA may allow additional modifications to Stock Classified PWC which provide for replacement/reinforcements to parts and components (i.e. intercooler end caps, brackets, fittings, etc.) that have known failure risks in race conditions. Such changes will only be allowed if they allow for no volume or performance gains. Such allowances are only legal if published by the IJSBA. Some original equipment components may not comply with IJSBA rules. Hull Identification Numbers must be displayed as furnished by the manufacturer.

NOTE: When rules permit or require equipment to be installed, replaced, altered or fabricated, it is the sole responsibility of the rider to select components, materials and/or fabricate the same so that the watercraft operates safely in competition.

24.1.2 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. (Refer to Model Homologation listing on page 10-11.)

24.1.3 Engine fuel must consist of gasoline meeting the criteria outlined in GENERAL TECHNICAL RULES.

24.2 HULL

24.2.1 All watercraft must have a flexible tow loop attached to the bow. The tow loop should be made of a flexible material (e.g., nylon strap, rope, etc.) so as not to create a hazard. Tow hooks which protrude beyond the plane of the hull must be removed.

24.2.2 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 and the placement of allowable relocated parts (i.e., ECU), the bulkhead may not be modified.

24.2.3 All watercraft may be equipped with a maximum of two sponsons. Original equipment sponsons may be modified, aftermarket, repositioned or removed. Overall length of each sponson shall not exceed 91.45cm (36.00 in.). Sponsons shall not protrude from the side of the hull by more than 100.00mm (3.94 in.) when measured in a level horizontal plane. The vertical channel created by the underside of the sponson shall not exceed 63.5mm (2.50 in.). 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 63.5mm (2.50 in.). Aftermarket or modified sponsons must exceed 6mm (0.24 in.) 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. Fins, rudders, skegs and other appendages that may create a hazard will not be allowed. (See diagrams in Appendix.)

- 24.2.4 Intake grate may be modified or aftermarket. Intake grate is required and must be the full-length type with at least one bar running parallel to the drive shaft. Grates may not extend more than 12.00mm (0.47 in.) below the flat plane of the pump intake area of the hull. All leading edges must be radiused so as not to create a hazard.
- 24.2.5 Pump cover plate may be modified or aftermarket. An extension may be added to the rear of the plate but shall not exceed the width of the original equipment plate. Modified and aftermarket plates must not extend more than 100.0mm (3.94 in.) beyond the end of the original equipment plate for Ski and Sport Division or 177.80mm (7.00 in.) for Runabout Divisions. The extension must be connected to the radiused portion of the pump plate so as not to create a hazard. (See diagram in Appendix.) Fins, rudders, skegs and other appendages that may create a hazard will not be allowed.
- 24.2.6 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 100.00mm (3.94 in.) 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.
- 24.2.7 Replacement bumpers may be used provided a hazard is not created.
- 24.2.8 A soft, flexible water-spray deflector may be attached to the hull sides or to the bond flange provided a hazard is not created. No part of the deflector may extend beyond the perimeter of the original equipment bumper or side moldings as measured by a plumb line.
- 24.2.9 Handlebar, throttle, throttle cable, and grips may be modified or aftermarket. Handlebar cover may be modified or removed. Aftermarket switches and switch housings may be used. Steering shaft, steering shaft holder and handlebar holder may be aftermarket. The handlebar must be padded at the mounting bracket or, if it has a crossbar, the crossbar must be padded. Aftermarket steering cables will be allowed.
- 24.2.10 Seat assembly may be aftermarket. Seat height may be changed.
- 24.2.11 Padding and/or mat kits may be added and custom painting is allowed. The surface finish of any metal component outside the area above the hull bond flange may be polished, shot peened or painted.
- 24.2.12 Original bilge pump may be modified or disconnected. Aftermarket bilge draining systems that do not create a hazard are allowed.
- 24.2.13 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.
- 24.2.14 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 will be allowed.
- 24.2.15 Handles, drop-in type storage buckets, bolt-on type mirrors and gauges may be modified, aftermarket or removed provided a hazard is not created.
- 24.2.16 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.

24.3 ENGINE — TWO-STROKE

- 24.3.1 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 designation (e.g., 550cc in 550 Limited, 800cc in 800 Limited, etc.). Chamfering of cylinder ports must not exceed 1.00mm (0.04 in.) at a 30 degree maximum angle. (See diagram in Appendix of IJSBA Rule Book.) Cylinders may be machined to accept girdle system cylinder heads.
- 24.3.2 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). Total weight of the crank-shaft assembly must be within $\pm 5.00\%$ of original equipment. Crankpins may be welded and/or keyed to the counterweights.
- 24.3.3 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.
- 24.3.4 External modifications to the engine finish (e.g., plating, polishing and/or painting) are allowed for cosmetic purposes only.
- 24.3.5 No internal modifications of any kind, including grinding, surfacing, polishing, machining, shot peening, etc., will be allowed on any engine components.
- 24.3.6 Cylinder head and gasket may be modified or aftermarket.
- 24.3.7 Exhaust manifold, head pipe, expansion chamber, gaskets and hose between expansion chamber and OEM water box 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 water box 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.
Removal of the plastic resonator is allowed.
- 24.3.8 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. 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.
- 24.3.9 Replacement starter motor and bendix may be used.
- 24.3.10 Replacement engine mounts may be used.
- 24.3.11 Oil-injection system may be disconnected or removed.
- 24.3.12 Replacement of general maintenance parts (e.g., gaskets, seals, spark plugs, spark plug wires, spark plug caps, wiring, water hoses, fuel lines, clamps and fasteners) shall not be restricted to original equipment providing the following:
- 1) Replacement gaskets may be used but must be of the same type (e.g., sheet, o-ring, etc.) as their OEM counterparts. Base gasket cannot be thicker than 1.52mm (0.060in).
 - 2) Stripped threads must be repaired to the original size.
 - 3) Fasteners (e.g., bolts, nuts and washers) may not be substituted with titanium pieces unless originally equipped. Fasteners may integrate locking mechanisms.

24.3.13 Cylinders may be interchanged between homologated watercraft of the same manufacturer subject to restrictions announced by the IJSBA. Any modifications to the cylinder or crankcase must be approved, in writing, by the IJSBA.

24.4 AIR/FUEL DELIVERY — TWO-STROKE

24.4.1 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.

24.4.2 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. Aftermarket or modified electric fuel pumps, not exceeding 4 psi, 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.

24.4.3 Aftermarket fuel-injection systems and components are allowed provided the following regulations are adhered to: High-pressure fuel hose 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. When the engine is shut off or stops, the fuel pump must automatically stop. No manually operated on/off-type fuel pumps are allowed.

24.4.4 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 aftermarket 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.

24.4.5 Flame arrester(s) which satisfy United States Coast Guard, SAE-J1928 Marine or UL-1111 Marine backfire flame arrester test standards must be installed. Aftermarket flame arresters satisfying one of these test standards will be allowed. Intake silencer may be removed.

24.4.6 Reed valve assemblies may be modified or aftermarket. Rotary valve may be modified or aftermarket.

24.5 IGNITION AND ELECTRONICS — TWO-STROKE

24.5.1 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.

24.5.2 Flywheel cover may be modified to accept a crankshaft-end bearing support.

24.5.3 Replacement batteries are allowed but must fit into the original equipment battery box and be securely fastened.

24.5.4 Engine temperature sensor may be disconnected and/or removed.

24.5.5 Relocation of electrical components (e.g., battery, box or housing) is allowed in order to fit an aftermarket exhaust system (only the strict minimum needed). Modification will be subject to Race/Tech Directors' approval.

24.6 DRIVELINE

24.6.1 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.

HYDRO PRO STOCK CLASS – The Hydro Pro Stock class will adhere to all **STOCK RUNABOUT CLASS** technical rules outlined in the 2013 IJSBA rule book in regard to runabouts with no exceptions.

RULE 25 - TECHNICAL RULES – PRO STOCK CLASS

25.1 STOCK CLASS COMPETITION

Intended to promote interest in stock personal watercraft competition and to enable individuals to become active competitors with relatively modest investment and maintenance costs. Watercraft competing in these classes must conform to the specifications which follow.

WEIGHT ADDENDUM: Craft must weigh within a difference of no more than 35 lbs (15.88 kg) lighter than the OEM weight as determined by IJSBA.

25.1.1 All watercraft must remain strictly stock, except where rules allow or require substitutions or modifications. Changes or modifications not listed here are not permitted. The IJSBA may allow additional modifications to Stock Classified PWC which provide for replacement/ reinforcements to parts and components (i.e. intercooler end caps, brackets, fittings, etc.) that have known failure risks in race conditions. Such changes will only be allowed if they allow for no volume or performance gains. Such allowances are only legal if published by the IJSBA. Some original equipment components may not comply with IJSBA rules. Hull Identification Numbers must be displayed as furnished by the manufacturer.

NOTE: When rules permit or require equipment to be installed, replaced, altered or fabricated, it is the sole responsibility of the rider to select components, materials and/or fabricate the same so that the watercraft operates safely in competition.

25.1.2 Original equipment parts may be updated or backdated to newer 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. (Refer to Model Homologation listing on page 10-11.)

25.1.3 Engine fuel must consist of gasoline meeting the criteria outlined in GENERAL TECHNICAL RULES.

25.2 HULL

25.2.1 All watercraft must have a flexible tow loop attached to the bow. The tow loop should be made of a flexible material (e.g., nylon strap, rope, etc.) so as not to create a hazard. Tow hooks which protrude beyond the plane of the hull must be removed.

25.2.2 Hull and deck repairs may be made. However, these repairs must not alter the original configuration by more than 2.00mm (0.08 in.). Handles, drop-in type storage buckets, bolt-on type mirrors and gauges may be modified, aftermarket or removed provided a hazard is not created. Other than for the use of fasteners and the placement of allowable relocated parts (i.e., ECU), the bulkhead may not be modified.

25.2.3 All watercraft may be equipped with a maximum of two sponsons. Original equipment sponsons may be modified, aftermarket, repositioned or removed. Overall length of each sponson shall not exceed 91.45cm (36.00 in.). Sponsons shall not protrude from the side of the hull by more than 100.00mm (3.94 in.) when measured in a level horizontal plane. The vertical channel created by the underside of the sponson shall not exceed 63.5mm (2.50in). 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 38.00mm (1.50 in.). Aftermarket or modified sponsons must exceed 6mm (0.24 in.) 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. Fins, rudders, skegs and other appendages that may create a hazard will not be allowed. (See diagrams in Appendix.)

25.2.4 Intake grate may be modified or aftermarket. Intake grate is required and must be the full-length type with at least one bar running parallel to the drive shaft. Grates may not extend more than 12.00mm (0.47 in.) below the flat plane of the pump intake area. All leading edges must be radiused so as not to create a hazard.

- 25.2.5 Pump cover plate may be modified or aftermarket. An extension may be added to the rear of the pump cover plate but shall not exceed the width of the original equipment plate. Modified and aftermarket plates must not extend more than 100.00mm (3.94 in.) beyond the end of the original equipment plate for Ski and Sport Division or 177.80mm (7.00 in.) for Runabout Divisions. 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. (See diagram in IJSBA rule Book Appendix.)
- 25.2.6 Replacement trim plates may be used. Only replica parts that offer handling characteristics the same as stock are allowed. Material shall not be restricted to original equipment provided a hazard is not created (i.e., aluminum in place of plastic). See Glossary of Terms for definition of Replacement and Replica.
- 25.2.7 Replacement bumpers may be used provided a hazard is not created.
- 25.2.8 A soft, flexible water-spray deflector may be attached to the hull sides or to the bond flange provided a hazard is not created. No part of the deflector may extend beyond the perimeter of the original equipment bumper or side moldings as measured by a plumb line.
- 25.2.9 Handlebar, throttle, throttle cable, and grips may be modified or aftermarket. Handlebar cover may be modified or removed. Aftermarket switches and switch housings may be used. Steering shaft, steering shaft holder and handlebar holder may be aftermarket. The handlebar must be padded at the mounting bracket or, if it has a crossbar, the crossbar must be padded. Quick-turn steering modifications to alter steering ratio are allowed. Aftermarket steering cables will be allowed.
- 25.2.10 Original equipment seat base must be used. Seat cover may be changed. Seat foam may be modified or aftermarket. The OEM seat height cannot be changed by more than +/- 12.7mm (0.5 in).
- 25.2.11 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 polished, shot peened or painted.
- 25.2.12 Original bilge pump may be modified or disconnected. Aftermarket bilge draining systems that do not create a hazard are allowed.
- 25.2.13 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.
- 25.2.14 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.
- 25.2.15 Original equipment braking devices may be disabled for safety purposes.

25.3 ENGINE — TWO-STROKE

- 25.3.1 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 IJSBA but such approval must be obtained in writing. Replacement piston assemblies must weigh within $\pm 25.00\%$ of original equipment. Engine displacement must not exceed class designation (e.g., 550cc in 550 Stock, 850cc in 850 Stock, etc.) unless otherwise noted. Chamfering of cylinder ports must not exceed 1.00mm (0.04 in.) at a 30 degree maximum angle. (See diagram in IJSBA Rule Book Appendix.).
- 25.3.2 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). Total weight of the crankshaft assembly must be within $\pm 5.00\%$ of original equipment. Crankpins may be welded and/or keyed to the counterweights.

- 25.3.3 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.
- 25.3.4 External modifications to the engine finish (e.g., plating, polishing and/or painting) are allowed for cosmetic purposes only.
- 25.3.5 No internal modifications of any kind, including grinding, surfacing, polishing, machining, shot peening, etc., will be allowed on any engine components.
- 25.3.6 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.
- 25.3.7 Engine, Intercooler, and Oil Cooler water cooling systems may be modified or aftermarket. Additional water cooling lines and aftermarket water bypass fittings may be added. OEM water bypass fittings may be modified or relocated. All bypass fittings must be directed downward and/or rearward so as not to create a hazard for other riders. Additional cooling supply lines and fittings may be added to the pump. Pump water inlet covers and water strainers (filters) may be modified or aftermarket. Intercooler assembly/housing must remain OEM in stock class, additional cooling supply lines and bypass fittings may be added to the OEM Intercooler Housing. Additional cooling supply lines may be added to water inlet covers that are removable from the engine block. Existing fittings may be aftermarket or modified so long as the OEM thread diameter is maintained. Fittings may not be added to the cylinder head, cylinder, or crankcase. Intercooler pressure relief valves (mechanical) are allowed for the purposes of regulating water pressure. Any valves used within the entire cooling system must be of the fixed type or automatic (e.g., thermostats, pressure regulators, etc.). Electronically controlled valves or 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."
- 25.3.8 Replacement starter motor and bendix may be used.
- 25.3.9 Replacement engine mounts may be used.
- 25.3.10 Oil-injection system may be disconnected or removed.
- 25.3.11 Replacement of general maintenance parts (e.g., gaskets, seals, spark plugs, spark plug wires, spark plug caps, wiring, water hoses, fuel lines, clamps and fasteners) shall not be restricted to original equipment providing the following:
- 1) Replacement gaskets may be used but must be of the same type (e.g., sheet, o-ring, etc.) as their OEM counterparts. With the exception of head gaskets and base gaskets, all replacement gaskets must maintain a thickness of plus or minus 20% of the OEM gasket thickness as furnished by the manufacturer. Base gasket cannot be thicker than 0.8mm (0.032in). Head gaskets must be no thinner than .005mm (0.002in) than the OEM thickness as supplied by the manufacturer. Head gaskets must be no thicker than 1.55mm (0.06in) than the OEM thickness as supplied by the manufacturer.
 - 2) Stripped threads must be repaired to the original size.
 - 3) Fasteners (e.g., bolts, nuts and washers) may not be substituted with titanium pieces unless originally equipped. Fasteners may integrate locking mechanisms.
- 25.3.12 Cylinders may be interchanged between homologated watercraft of the same manufacturer subject to restrictions announced by the IJSBA. Any modifications to the cylinder or crankcase must be approved, in writing, by the IJSBA.

25.4 ENGINE — FOUR-STROKE

- 25.4.1 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 IJSBA but such approval must be obtained in writing. Replacement piston assemblies must weigh within $\pm 25.00\%$ of original equipment. Engine displacement must not exceed class designation unless otherwise noted. Chamfering of cylinder ports must not exceed 1.00mm (0.04 in.) at a 30 degree maximum angle. (See diagram in Appendix.). 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 ScotchBrite®. Repairs to the cylinder head affecting one cylinder bank are allowed.

25.4.2 Crankshaft must remain stock. Replacement bearings or bearing shells are allowed, providing they maintain their original type and dimensions.

25.4.3 Camshaft(s) must remain stock. Replacement bearings or bearing shells are allowed, providing they maintain their original type and dimensions. Camshaft timing may be changed.

25.4.4 Intake and exhaust valves may be shimmed with OEM or aftermarket shims. Valves and valve seats are not restricted to OEM providing that any replacement valves or seats maintain the OEM weights and dimensions.

25.4.5 Engine, Intercooler, and Oil Cooler water cooling systems may be modified or aftermarket. Additional water cooling lines and aftermarket water bypass fittings may be added. OEM water bypass fittings may be modified or relocated. All bypass fittings must be directed downward and/or rearward so as not to create a hazard for other riders. Additional cooling supply lines and fittings may be added to the pump. Pump water inlet covers and water strainers (filters) may be modified or aftermarket. Intercooler assembly/housing must remain OEM in stock class, additional cooling supply lines and bypass fittings may be added to the OEM Intercooler Housing. Additional cooling supply lines may be added to water inlet covers that are removable from the engine block. Volume changes to OEM water supply fittings are not allowed. Existing fittings may be aftermarket or modified so long as the OEM thread diameter is maintained. Fittings may not be added to the cylinder head, cylinder, or crankcase. Intercooler pressure relief valves (mechanical) are allowed for the purposes of regulating water pressure. Any valves used within the entire cooling system must be of the fixed type or automatic (e.g., thermostats, pressure regulators, etc.). Electronically controlled valves or 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."

25.4.6 Valve cover may be modified or replaced for cosmetic purposes and/or weight reduction only.

25.4.7 Replacement of general maintenance parts (e.g., gaskets, seals, spark plugs, spark plug wires, spark plug caps, wiring, water hoses, fuel lines, clamps and fasteners) shall not be restricted to original equipment providing the following:

- 1) Replacement gaskets may be used but must be of the same type (e.g., sheet, o-ring, etc.) as their OEM counterparts. With the exception of head gaskets and base gaskets, all replacement gaskets must maintain a thickness of plus or minus 20% of the OEM gasket thickness as furnished by the manufacturer. Base gasket cannot be thicker than 0.8mm (0.032in). Head gaskets must be no thinner than .005mm (0.002in) than the OEM thickness as supplied by the manufacturer. Head gaskets must be no thicker than 1.55mm (0.06in) than the OEM thickness as supplied by the manufacturer.
- 2) Stripped threads must be repaired to the original size.
- 3) Fasteners (e.g., bolts, nuts and washers) may not be substituted with titanium pieces unless originally equipped. Fasteners may integrate locking mechanisms.

25.4.8 When Four-Stroke and Two-Stroke Ski PWC are combined in the same Stock Class then the IJSBA may require that those Four-Stroke Ski PWC which are not normally aspirated (Turbocharged or Supercharged) shall be affixed with an IJSBA approved boost regulator. The boost regulator shall be set to release any boost pressure above 110% of the stock specifications. The IJSBA shall publish the official interpretation of the stock specifications.

25.4.9 (Runabout Only) A stop valve may be affixed to the intercooler supply line in order to prevent surges which might cause damage to the intercooler. Blow off valves may be added to protect engine life.

25.5 AIR/FUEL DELIVERY — TWO-STROKE

25.5.1 Aftermarket flame arresters that meet USCG, UL-1111 or SAE J-1928 Marine standards may be used. 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.

- 25.5.2 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 pickup, fuel filler, fuel filter, 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.

25.6 AIR/FUEL DELIVERY — FOUR-STROKE

- 25.6.1 **Electronic fuel-injection systems:** Flame arresters that meet USCG, UL-1111 or SAE J-1928 Marine backfire flame arrester test standards must be installed. If not equipped with an airflow sensor, the ducting between the flame arrester 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 arrester and airflow sensor. Modifications to the airflow downstream of the airflow sensor are not allowed. No modifications to the turbocharger and supercharger system, if applicable, are allowed.

- 25.6.2 **Carbureted induction systems:** Flame arrestors that meet USCG, UL-1111 or SAE J-1928 Marine backfire flame arrester test standards must be installed. 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.

- 25.6.3 Fuel injectors and fuel pump must remain stock. Fuel pressure regulator may be aftermarket or modified to change fuel pressure.

- 25.6.4 Aftermarket Valve Spring Retainers may be used so long as OEM valve springs are used.

25.7 IGNITION AND ELECTRONICS — TWO-STROKE

- 25.7.1 Replacement batteries are allowed but must fit into the original equipment battery box and be securely fastened.

- 25.7.2 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.

- 25.7.3 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.

- 25.7.4 Aftermarket spark plugs with a different heat rating may be used.

25.8 IGNITION AND ELECTRONICS — FOUR-STROKE

- 25.8.1 Replacement batteries are allowed but must fit into the original equipment battery box and be securely fastened.

- 25.8.2 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.

- 25.8.3 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.

- 25.8.4 Aftermarket spark plugs with a different heat rating may be used.

25.9 TURBOCHARGER/SUPERCHARGER

- 25.9.1 Modifications to any part of the turbocharger or supercharger system (i.e., housing, turbines, rotors, sensors, ducting, etc.) are not allowed.

25.10 DRIVELINE

- 25.10.1 Impeller may be modified or aftermarket, providing that the original diameter is maintained. 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 pump inlet. Visibility spout must be removed or plugged.
- 25.10.2 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.).

HYDRO SPEC CLASS (Formerly known as Hydro Limited)

The Hydro Spec Class will include pwc that are Normally Aspirated and Intake Boosted (turbocharged or supercharged).

Normally Aspirated

Normally Aspirated will adhere to Open Class technical rules (see Super Stock Class section) as outlined in the 2013 IJSBA rule book in regard to runabouts with no exceptions. Use of aftermarket hulls and aftermarket cylinders is permitted.

Intake Boosted

Intake Boosted will adhere to Limited Class rules (see immediately below) as outlined in the 2013 IJSBA rule book in regard to runabouts with no exceptions.

RULE 26 - TECHNICAL RULES –NATURALLY ASPIRATED

26.1 LIMITED CLASS COMPETITION

Intended to promote interest in personal watercraft competition with a limited number of modifications, and to enable individuals to become active competitors with a relatively modest investment. Watercraft competing in this class must conform to the specifications which follow.

- 26.1.1 All watercraft must remain strictly stock (all Stock Class provisions are allowed in Limited Class unless otherwise noted), except where rules allow or require substitutions or modifications. Changes or modifications not listed here are not permitted. The IJSBA may allow additional modifications to Stock Classified PWC which provide for replacement/reinforcements to parts and components (i.e. intercooler end caps, brackets, fittings, etc.) that have known failure risks in race conditions. Such changes will only be allowed if they allow for no volume or performance gains. Such allowances are only legal if published by the IJSBA. Some original equipment components may not comply with IJSBA rules. Hull Identification Numbers must be displayed as furnished by the manufacturer.

NOTE: When rules permit or require equipment to be installed, replaced, altered or fabricated, it is the sole responsibility of the rider to select components, materials and/or fabricate the same so that the watercraft operates safely in competition.

- 26.1.2 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. (Refer to Model Homologation listing on page 10-11.)
- 26.1.3 Engine fuel must consist of gasoline meeting the criteria outlined in GENERAL TECHNICAL RULES.

26.2 HULL

- 26.2.1 All watercraft must have a flexible tow loop attached to the bow. The tow loop should be made of a flexible material (e.g., nylon strap, rope, etc.) so as not to create a hazard. Tow hooks which protrude beyond the plane of the hull must be removed.
- 26.2.2 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 and the placement of allowable relocated parts (i.e., ECU), the bulkhead may not be modified.
- 26.2.3 All watercraft may be equipped with a maximum of two sponsons. Original equipment sponsons may be modified, aftermarket, repositioned or removed. Overall length of each sponson shall not exceed 91.45cm (36.00 in.). Sponsons shall not protrude from the side of the hull by more than 100.00mm (3.94 in.) when measured in a level horizontal plane. The vertical channel created by the underside of the sponson shall not exceed 63.5mm (2.50 in.). 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 63.5mm (2.50 in.). Aftermarket or modified sponsons must exceed 6mm (0.24 in.) 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. Fins, rudders, skegs and other appendages that may create a hazard will not be allowed. (See diagrams in Appendix.)

- 26.2.4 Intake grate may be modified or aftermarket. Intake grate is required and must be the full-length type with at least one bar running parallel to the drive shaft. Grates may not extend more than 12.00mm (0.47 in.) below the flat plane of the pump intake area of the hull. All leading edges must be radiused so as not to create a hazard.
- 26.2.5 Pump cover plate may be modified or aftermarket. An extension may be added to the rear of the plate but shall not exceed the width of the original equipment plate. Modified and aftermarket plates must not extend more than 100.0mm (3.94 in.) beyond the end of the original equipment plate for Ski and Sport Division or 177.80mm (7.00 in.) for Runabout Divisions. The extension must be connected to the radiused portion of the pump plate so as not to create a hazard. (See diagram in Appendix.) Fins, rudders, skegs and other appendages that may create a hazard will not be allowed.
- 26.2.6 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 100.00mm (3.94 in.) 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.
- 26.2.7 Replacement bumpers may be used provided a hazard is not created.
- 26.2.8 A soft, flexible water-spray deflector may be attached to the hull sides or to the bond flange provided a hazard is not created. No part of the deflector may extend beyond the perimeter of the original equipment bumper or side moldings as measured by a plumb line.
- 26.2.9 Handlebar, throttle, throttle cable, and grips may be modified or aftermarket. Handlebar cover may be modified or removed. Aftermarket switches and switch housings may be used. Steering shaft, steering shaft holder and handlebar holder may be aftermarket. The handlebar must be padded at the mounting bracket or, if it has a crossbar, the crossbar must be padded. Aftermarket steering cables will be allowed.
- 26.2.10 Seat assembly may be aftermarket. Seat height may be changed.
- 26.2.11 Padding and/or mat kits may be added and custom painting is allowed. The surface finish of any metal component outside the area above the hull bond flange may be polished, shot peened or painted.
- 26.2.12 Original bilge pump may be modified or disconnected. Aftermarket bilge draining systems that do not create a hazard are allowed.
- 26.2.13 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.
- 26.2.14 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 will be allowed.
- 26.2.15 Handles, drop-in type storage buckets, bolt-on type mirrors and gauges may be modified, aftermarket or removed provided a hazard is not created.
- 26.2.16 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.

26.3 ENGINE — TWO-STROKE

- 26.3.1 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 designation (e.g., 550cc in 550 Limited, 800cc in 800 Limited, etc.). Chamfering of cylinder ports must not exceed 1.00mm (0.04 in.) at a 30 degree maximum angle. (See diagram in Appendix of IJSBA Rule Book.) Cylinders may be machined to accept girdle system cylinder heads.
- 26.3.2 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). Total weight of the crank-shaft assembly must be within $\pm 5.00\%$ of original equipment. Crankpins may be welded and/or keyed to the counterweights.
- 26.3.3 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.
- 26.3.4 External modifications to the engine finish (e.g., plating, polishing and/or painting) are allowed for cosmetic purposes only.
- 26.3.5 No internal modifications of any kind, including grinding, surfacing, polishing, machining, shot peening, etc., will be allowed on any engine components.
- 26.3.6 Cylinder head and gasket may be modified or aftermarket.
- 26.3.7 Exhaust manifold, head pipe, expansion chamber, gaskets and hose between expansion chamber and OEM water box 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 water box 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.
- 2-stroke and 4-stroke:** Removal of the plastic resonator is allowed.
- 26.3.8 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. 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.
- 26.3.9 Replacement starter motor and bendix may be used.
- 26.3.10 Replacement engine mounts may be used.
- 26.3.11 Oil-injection system may be disconnected or removed.
- 26.3.12 Replacement of general maintenance parts (e.g., gaskets, seals, spark plugs, spark plug wires, spark plug caps, wiring, water hoses, fuel lines, clamps and fasteners) shall not be restricted to original equipment providing the following:
- 4) Replacement gaskets may be used but must be of the same type (e.g., sheet, o-ring, etc.) as their OEM counterparts. Base gasket cannot be thicker than 1.52mm (0.060in).
 - 5) Stripped threads must be repaired to the original size.
 - 6) Fasteners (e.g., bolts, nuts and washers) may not be substituted with titanium pieces unless originally equipped. Fasteners may integrate locking mechanisms.

26.3.13 Cylinders may be interchanged between homologated watercraft of the same manufacturer subject to restrictions announced by the IJSBA. Any modifications to the cylinder or crankcase must be approved, in writing, by the IJSBA.

26.4 AIR/FUEL DELIVERY — TWO-STROKE

26.4.1 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.

26.4.2 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. Aftermarket or modified electric fuel pumps, not exceeding 4 psi, 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.

26.4.3 Aftermarket fuel-injection systems and components are allowed provided the following regulations are adhered to: High-pressure fuel hose 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. When the engine is shut off or stops, the fuel pump must automatically stop. No manually operated on/off-type fuel pumps are allowed.

26.4.4 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 aftermarket 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.

26.4.5 Flame arrester(s) which satisfy United States Coast Guard, SAE-J1928 Marine or UL-1111 Marine backfire flame arrester test standards must be installed. Aftermarket flame arresters satisfying one of these test standards will be allowed. Intake silencer may be removed.

26.4.6 Reed valve assemblies may be modified or aftermarket. Rotary valve may be modified or aftermarket.

26.5 AIR/FUEL DELIVERY — FOUR-STROKE

26.5.1 A fuel pressure regulator may be added or modified for safety purposes.

26.6 IGNITION AND ELECTRONICS — TWO-STROKE

26.6.1 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.

26.6.2 Flywheel cover may be modified to accept a crankshaft-end bearing support.

26.6.3 Replacement batteries are allowed but must fit into the original equipment battery box and be securely fastened.

26.6.4 Engine temperature sensor may be disconnected and/or removed.

26.6.5 Relocation of electrical components (e.g., battery, box or housing) is allowed in order to fit an aftermarket exhaust system (only the strict minimum needed). Modification will be subject to Race/Tech Directors' approval.

26.7 DRIVELINE

26.7.1 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.

26.8 ENGINE — FOUR-STROKE

- 26.8.1 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 (ie skirt shape that is not an exact replica of the OEM piston) may be approved by the IJSBA but such approval must be obtained in writing. Replacement piston assemblies must weigh within $\pm 25.00\%$ of original equipment. Engine displacement must not exceed class designation unless otherwise noted. Chamfering of cylinder ports must not exceed 1.00mm (0.04 in.) at a 30 degree maximum angle. (See diagram in Appendix.).
- 26.8.2 Crankshaft may be rebuilt/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 crankshaft to improve oil flow or redirection is allowed. Replacement bearing shells are allowed provided the following: (max. allowable undersized bearing is .060 or 1.5mm). Total weight of the crankshaft assembly must be within $\pm 5.00\%$ of original equipment. Damaged rod or main journals may be welded and machined to their OEM dimensions or within the allowable bearing sizes.
- 26.8.3 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.
- 26.8.4 External modifications to the engine finish (e.g., plating, polishing and/or painting) are allowed for cosmetic purposes only.
- 26.8.5 No internal modifications of any kind, including grinding, surfacing, polishing, machining, shot peening, etc., will be allowed on any engine components.
- 26.8.6 Engine, Intercooler, and Oil Cooler water cooling systems may be modified or aftermarket. Additional water cooling lines and aftermarket water bypass fittings may be added. OEM water bypass fittings may be modified or relocated. All bypass fittings must be directed downward and/or rearward so as not to create a hazard for other riders. Additional cooling supply lines and fittings may be added to the pump. Pump water inlet covers and water strainers (filters) may be modified or aftermarket. Intercooler assembly/housing must remain OEM in stock class, additional cooling supply lines and bypass fittings may be added to the OEM Intercooler Housing. Additional cooling supply lines may be added to water inlet covers that are removable from the engine block. Volume changes to OEM water supply fittings are not allowed. Existing fittings may be aftermarket or modified so long as the OEM thread diameter is maintained. Fittings may not be added to the cylinder head, cylinder, or crankcase. Intercooler pressure relief valves (mechanical) are allowed for the purposes of regulating water pressure. Any valves used within the entire cooling system must be of the fixed type or automatic (e.g., thermostats, pressure regulators, etc.). Electronically controlled valves or 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."
- 26.8.7 Replacement starter motor and bendix may be used.
- 26.8.8 Replacement engine mounts may be used.
- 26.8.9 Replacement of general maintenance parts (e.g., gaskets, seals, spark plugs, spark plug wires, spark plug caps, wiring, water hoses, fuel lines, clamps and fasteners) shall not be restricted to original equipment providing the following:
- 1) Replacement gaskets may be used but must be of the same type (e.g., sheet, o-ring, etc.) and thickness as their OEM counterparts

2) Fasteners (e.g., bolts, nuts and washers) may not be substituted with titanium pieces unless originally equipped. Fasteners may integrate locking mechanisms.

26.8.10 Camshafts may be modified or aftermarket.

26.8.11 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.

26.8.12 Blow-off valves may be added to extend engine life.

26.8.13 Aftermarket valve spring retainers may be used.

26.9 AIR/FUEL DELIVERY — FOUR-STROKE

26.9.1 Turbocharger or Supercharger impeller housing must remain stock as furnished by the manufacturer. All internal supercharger or turbocharger parts may be modified or aftermarket. Where an OEM turbocharger or supercharger housing may be spaced to accommodate a larger impeller, the spacer shall be allowed providing no other modifications are necessary to accommodate the spacer. Intercoolers may be modified or aftermarket.

26.9.2 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 aftermarket 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.

26.9.3 A fuel pressure regulator may be added if not originally equipped. OEM fuel pressure regulators may be modified or aftermarket for safety purposes.

26.9.4 Throttle bodies must remain stock as supplied by the manufacturer. No changing of throttle plate angles and/or modifications to the throttle body housing. No phenolic or aluminum spacers are allowed behind the throttle body.

26.9.5 Fuel injectors may be modified or aftermarket.

HYDRO SUPER STOCK CLASS - The Hydro SUPER STOCK class will adhere to all OPEN CLASS technical rules outlined in the 2013 IJSBA rule book in regard to runabouts with no exceptions.

RULE 27 - TECHNICAL RULES – SUPER STOCK CLASS

27.1 **SUPERSTOCK ADDENDUM:** If a class is designated as Super Stock then Open Class rules shall apply with the exception of 27.2.2 (aftermarket hulls) as provided for in the IJSBA Rule Book.

DISPLACEMENT ADDENDUM: All Normally Aspirated Four Stroke Ski PWC shall be allowed a maximum displacement of 1100cc or OEM displacement plus 1mm overbore on all cylinders (whichever is greater). All Normally Aspirated Two Stroke Ski PWC shall be allowed a maximum displacement of 1200cc. Any Ski PWC which is supercharged or turbocharged shall be limited to a maximum displacement of 800cc or OEM displacement plus 1mm overbore on all cylinders (whichever is greater).

27.1.1 All watercraft must remain strictly stock, except where rules allow or require substitutions or modifications. Changes or modifications not listed here are not permitted. Some original equipment components may not comply with IJSBA rules. Hull Identification Numbers must be displayed as furnished by the manufacturer.

NOTE: When rules permit or require equipment to be installed, replaced, altered or fabricated, it is the sole responsibility of the rider to select components, materials and/or fabricate the same so that the watercraft operates safely in competition.

27.1.2 Original equipment parts may be updated or backdated to 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. (Refer to Model Homologation listing on page 10-11.)

27.1.3 Engine fuel must consist of gasoline meeting the criteria outlined in GENERAL TECHNICAL RULES.

27.1.4 At all times, the watercraft must weigh no less than 10 percent under the watercraft's original dry weight as determined by the IJSBA, providing the following:

- Includes fuel and oil.
- Includes the water in the water box, so long as the water box is not deemed to be out of ordinary in volume.
- Includes the battery.
- All reasonable amount of water must be removed from all compartments.

Ballast weight may be added prior to competition to meet the required weight.

Craft must weigh a minimum of 750 LBS.

27.2 HULL

27.2.1 All watercraft must have a flexible tow loop attached to the bow. The tow loop should be made of a flexible material (e.g., nylon strap, rope, etc.) so as not to create a hazard. Tow hooks, which protrude beyond the plane of the hull, must be removed.

27.2.2 Aftermarket hulls may NOT 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. Fasteners may be installed through the hull and deck for the purpose of securing components to interior surfaces, provided a hazard is not created. 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). (See bond flange diagram in IJSBA Rule Book Appendix.)

27.2.3 All watercraft may be equipped with a maximum of two sponsons. Original equipment sponsons may be modified, aftermarket, repositioned or removed. Overall length of each sponson shall not exceed

91.45cm (36.00 in.). Sponsons shall not protrude from the side of the hull by more than 100.00mm (3.94 in.) when measured in a level horizontal plane. The vertical channel created by the underside of the sponson shall not exceed 63.5mm (2.50 in.). 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 63.5mm (2.50 in.). Aftermarket or modified sponsons must exceed 6mm (0.24 in.) 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. Fins, rudders, skegs and other appendages that may create a hazard will not be allowed. (See diagrams in Appendix.)

- 27.2.4 Intake grate may be modified or aftermarket. Intake grate is required and must be the full-length type with at least one bar running parallel to the drive shaft. Grates may not extend more than 12.00mm (0.47 in.) below the flat plane of the pump intake area. All leading edges must be radiused so as not to create a hazard.
- 27.2.5 Pump cover plate may be modified or aftermarket. An extension may be added to the rear of the pump cover plate but shall not exceed the width of the original equipment plate. Modified and aftermarket plates must not extend more than 100.00mm (3.94 in.) beyond the end of the original equipment plate for Ski and Sport Division or 177.80mm (7.00 in.) for Runabout Divisions. The sides of the extension must be connected to the radiused portion of the pump plate so as not to create a hazard. (See diagram in Appendix.) Fins, rudders, skegs and other appendages that may create a hazard will not be allowed.
- 27.2.6 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. 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.
- 27.2.7 Replacement bumpers may be used provided a hazard is not created.
- 27.2.8 A soft, flexible water-spray deflector may be attached to the hull sides or to the bond flange provided a hazard is not created. No part of the deflector may extend beyond the perimeter of the original equipment bumper or side moldings as measured by a plumb line.
- 27.2.9 Handlebar, throttle, throttle cable, and grips may be modified or aftermarket. Handlebar cover may be modified or removed. Aftermarket switches and switch housings may be used. Steering shaft, steering shaft holder and handlebar holder may be aftermarket. The handlebar must be padded at the mounting bracket or, if it has a crossbar, the crossbar must be padded. Aftermarket steering cables are allowed.
- 27.2.11 Sport and Runabout Division Only: Seat assembly may be modified or aftermarket. Seat height may be changed.
- 27.2.12 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 polished, shot peened or painted.
- 27.2.13 Original bilge pump may be modified or disconnected. Aftermarket bilge draining systems that do not create a hazard are allowed.
- 27.2.14 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.
- 27.2.15 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.

27.2.16 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.

27.3 ENGINE — TWO-STROKE

27.3.1 Engines may be bored. Aftermarket piston assemblies are allowed. Engine displacement must not exceed class designation (e.g., 800cc in 800 Super Stock, 1600 Open, etc.). The number, type, and placement of rings on piston may be changed.

27.3.2 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.

27.3.3 Crankshaft assembly may be modified or aftermarket. Stroke and rod length may be changed.

27.3.4 Engine balancing assemblies may be modified, aftermarket, or removed.

27.3.5 Cylinders may be interchanged between homologated watercraft of the same manufacturer subject to restrictions announced by the IJSBA. Any modifications to the cylinder or crankcase must be approved, in writing, by the IJSBA. 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 aftermarket 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-system cylinder heads. Water-cooling fittings may be added to cylinder. Exhaust power valve components and means of actuation may be modified or aftermarket.

27.3.6 External modifications to the engine finish (e.g., plating, polishing and/or painting) are allowed for cosmetic purposes only.

27.3.7 Cylinder head may be modified or aftermarket.

27.3.8 Engine gaskets may be modified or aftermarket.

27.3.9 Exhaust system (i.e., manifold, head pipe, expansion chamber, water box, muffler(s), etc.) may be modified or aftermarket. Through-hull exhaust may be modified or aftermarket, providing a hazard is not created. 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.

27.3.10 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.

27.3.11 Replacement starter motor and bendix may be used.

27.3.12 Replacement engine mounts may be used.

27.3.13 Oil-injection system may be disconnected or removed.

27.3.14 Replacement of general maintenance parts (e.g., spark plugs, spark plug wires, spark plug caps, wiring, water hoses, fuel lines, clamps and fasteners) shall not be restricted to original equipment. Stripped threads can be repaired.

27.4 ENGINE — FOUR-STROKE

- 27.4.1 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.
- 27.4.2 The original cylinder head casting must be used. 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.
- 27.4.3 Aftermarket valve train components are allowed, providing the original method of activation is maintained (e.g., if originally activated by a camshaft, they may not be converted 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.
- 27.4.4 Engines may be bored. Aftermarket piston assemblies are allowed. Engine displacement must not exceed class designation (e.g., 1100cc in Runabout 1100 Super Stock, 1600cc in Runabout Super Stock Turbo, etc.).
- 27.4.5 Crankshaft may be modified or aftermarket. Total weight of the crankshaft must be within +/-5.00% of original equipment. Replacement bearings or bearing shells are allowed, providing they maintain their original type and dimensions. PWC homologated above 1600cc must maintain original stroke.
- 27.4.6 Engine balancing assemblies may be modified, aftermarket, or removed.
- 27.4.7 Aftermarket connecting rods made of ferrous materials are allowed. Rod length may be changed.
- 27.4.8 Exhaust system (i.e., manifold, connecting pipes, hoses, muffler(s), etc.) may be modified or aftermarket. Through-hull exhaust may be modified or aftermarket, providing 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.
- 27.4.9 Cooling system may be modified or aftermarket. 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 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 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.
- 27.4.10 Baffles in oil reservoir may be modified. The addition of baffles in oil reservoir is allowed. Oil pump may be modified or aftermarket.
- 27.4.11 Valve cover may be replaced for cosmetic purposes and/or weight reduction only.
- 27.4.12 Replacement starter motor and bendix may be used.
- 27.4.13 Replacement engine mounts may be used.
- 27.4.14 External modifications to the engine finish (e.g., plating, polishing and/or painting) are allowed for cosmetic purposes only.
- 27.4.15 Replacement of general maintenance parts (e.g., gaskets, seals, spark plug wires, spark plug caps, wiring, water hoses, fuel lines, fuel filters, oil filters, clamps and fasteners) shall not be restricted to original equipment. Stripped threads may be repaired. Fasteners may integrate locking mechanisms.

27.5 AIR/FUEL DELIVERY — TWO-STROKE

- 27.5.1 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.

27.5.2 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. Aftermarket or modified electric fuel pumps, not exceeding 4 psi, 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.

27.5.3 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. When the engine is shut off or stops, the fuel pump must automatically stop. No manually operated on/off-type fuel pumps are allowed.

27.5.4 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 fuel tank shall not be restricted to the original equipment, as supplied by the manufacturer, so long as the replacement is an unmodified tank from another homologated PWC and the tank fits securely in the watercraft without causing a hazard. Original equipment 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 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. Aftermarket fuel tanks not coming from another homologated PWC may be allowed by the race director so long as it is demonstrated that the aftermarket fuel tanks meet or exceed the strengths and safety standards of an OEM fuel tank.

27.5.5 Flame arrester(s) which satisfy United States Coast Guard, SAE-J1928 Marine or UL-1111 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.

27.5.6 Reed valve assemblies may be modified or aftermarket. Rotary valve may be modified or aftermarket.

27.6 AIR/FUEL DELIVERY — FOUR-STROKE

27.6.1 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 27.6.2 Flame arresters that meet USCG, UL-1111 or SAE J-1928 Marine standards must be used. Airflow sensor may be modified, aftermarket or removed. Ducting between the flame arrester and throttle body may be modified or aftermarket.

27.6.3 Throttle body may be modified or aftermarket. The number of butterflies may be increased but may not exceed the number of cylinders. Intake manifold assembly may be modified or aftermarket.

27.6.4 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.

27.7 IGNITION AND ELECTRONICS — TWO-STROKE/FOURSTROKE

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

27.7.2 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.

27.7.3 Engine temperature sensor assembly may be disconnected and/or removed.

27.8 TURBOCHARGER/SUPERCHARGER

27.8.1 Turbocharger housing must be of the full circulating, water-jacket type at all times when the engine is running. 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. All hoses and pipes may be modified or aftermarket.

27.8.2 Intercooler may be modified or aftermarket.

27.8.3 Boost pressure-relief valve may be modified or aftermarket

27.8.4 Boost sensor may be modified or aftermarket.

27.9 DRIVELINE

27.9.1 Impeller, impeller housing, stator vane assembly, pump mounting plate and/or pump shoe 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.

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

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, innovation, creative engineering, and fabrication.

The Hydro Unlimited class will adhere to all MODIFIED CLASS technical rules outlined in the 2013 IJSBA rule book in regard to runabouts with the following exceptions.

UNLIMITED CLASS 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 IJSBA 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. Nitros Oxide Boosting permitted, with respect to ALL "fuel induction" and "safety" rules outlined by the IJSBA rule book being in FULL affect.
6. Use of leaded race fuel is permitted.
7. Engines **MUST BE BASED ON AN IJSBA HOMOLOGATED RUNABOUT ENGINE.**
8. Full modifications are allowed to crankshaft, cylinders, pistons, crankcases, valves, lifters, heads and exhaust.
9. 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 28 - TECHNICAL RULES – HYDRO UNLIMITED CLASS

28.1 OVERVIEW

28.1.1 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.

28.2 SEATS

28.2.1 **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. The seat base CAN NOT be modified in any way.

28.3 HULL

28.3.1 **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.

28.3.2 **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.

- 28.3.3 **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.

28.4 AFTERMARKET OR MODIFIED HULLS

- 28.4.1 **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.

- 28.4.2 **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.

- 28.4.3 **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.

- 28.4.5 **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.

- 28.4.6 **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).

- 28.4.7 **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.

- 28.4.9 **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.

- 28.4.10 **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.

28.5 ENGINE - TWO-STROKE

- 28.5.1 **Engines:** Engines may be bored. Aftermarket piston assemblies are allowed. The number, type, and placement of rings on piston may be changed.

- 28.5.2 **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.

- 28.5.3 **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.

- 28.5.4 **Crankshaft:** Crankshaft assembly may be modified or aftermarket. Stroke and rod length may be modified.
- 28.5.5 **Engine Balancing Assemblies:** Engine balancing assemblies may be modified, aftermarket, or removed.
- 28.5.6 **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 IJSBA. 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 aftermarket 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.
- 28.5.7 **Cylinder Head:** Cylinder head may be modified or aftermarket.
- 28.5.8 **Gaskets:** Engine gaskets may be modified or aftermarket.
- 28.5.9 **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.
- 28.5.10 **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.

28.6 ENGINE - FOUR-STROKE

- 28.6.1 **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.
- 28.6.2 **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.
- 28.6.3 **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.
- 28.6.4 **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.).
- 28.6.5 **28.6.6 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.
- 28.6.6 **Engine Balancing Assemblies:** Engine balancing assemblies may be modified, aftermarket or removed.
- 28.6.7 **Rods:** Aftermarket connecting rods made of ferrous materials are allowed. Rod length may be changed.

28.6.8 **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.

28.6.9 **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.

28.6.10 **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.

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

28.7 AIR/FUEL DELIVERY - TWO-STROKE

28.7.1 **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.

28.7.2 **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.

28.7.3 **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.

28.7.4 **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.

28.7.5 **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.

28.7.6 **Flame Arresters:** Flame arrester(s) which satisfy United States Coast Guard, SAE-J1928 Marine or UL-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.

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

28.8 AIR/FUEL DELIVERY - FOUR-STROKE

28.8.1 **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.

28.8.2 **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.

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

28.8.4 **Intake Manifold:** Intake manifold assembly may be modified or aftermarket.

28.8.5 **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.

28.9 IGNITION AND ELECTRONICS - TWO AND FOUR-STROKE

28.9.1 **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.

28.9.2 **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.

28.9.3 **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.

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

28.10 TURBOCHARGER/SUPERCHARGER

28.10.1 **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.

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

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

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

28.11 DRIVELINE AND PUMP

28.11.1 **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.

28.11.2 **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.

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

28.11.4 **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.

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

FOR MORE SPECIFIC INFORMATION ON THE HYDRODRAG EVENTS PLEASE CONTACT MIKE
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