

- 10) Engine gaskets beyond tolerable limits as specified.
- 11) Sponson length/depth exceeds specifications in rulebook.
- 12) Intake grate depth has been exceeded beyond rule book specs.
- 13) Rideplate length exceeds rule book specs.
- 14) Modifications to the waterbox.
- 15) Hull modifications.

RULE 25 - TECHNICAL RULES – OPEN CLASSES

25.1 OVERVIEW

25.1.1 Open Classes are intended to promote the highest level of modification, handling, control and speed in the sport of personal watercraft racing. Watercraft competing in this class must conform to the specifications which follow. All watercraft must remain strictly stock except where rules allow or require substitutions or modifications. Changes or modifications not listed here are not permitted. Original equipment parts may be updated or backdated to original equipment parts of the same model. The part must be a bolt-on type part requiring no modifications to that part or any other parts except where rules allow substitutions or modifications. The rules and regulations below are in addition to all General Technical rules listed in Rule 22.

25.1.2 **Legal Updates:** Yamaha SuperJets produced prior to 1996 may update to 1996 and newer engine components. Kawasaki JS750SX and SXi may update to SXi Pro engine components.

25.2 SEATS

25.2.1 **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.

25.3 HULL

25.3.1 **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.

25.3.2 **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.

25.3.3 **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.

25.4 AFTERMARKET OR MODIFIED HULLS

25.4.1 **Aftermarket Hull Classes:** The following rules apply to the Expert Runabout 1200 Open and Pro-Am Runabout 1200 Open classes only. All other classes must run a stock OEM hull.

25.4.2 **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.

25.4.3 **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.

25.4.4 **Weight Requirements:** At all times, the watercraft must weigh no less than 10 percent under the watercraft's original dry weight as determined by the APBA Technical Committee, providing the following:

- Includes fuel and oil.
- Includes the water in the waterbox, so long as the waterbox is not deemed to be out of ordinary in volume.
- Includes the battery.
- All reasonable amount of water must be removed from all compartments.
- For a list of published weights and the method of computing the minimum weight see Addendum E.

25.4.5 **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.

25.4.6 **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).

25.4.7 **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.

25.4.9 **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.

- 25.4.10 **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.

25.5 ENGINE - TWO-STROKE

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

- 25.5.2 **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.

- 25.5.3 **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.

- 25.5.4 **Crankshaft:** Crankshaft assembly may be modified or aftermarket. Stroke and rod length may be modified.

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

- 25.5.6 **Cylinders:** Cylinders may be interchanged between watercraft of the same manufacturer. Any modifications to the cylinder or crankcase must be approved, in writing, by the APBA. Base gasket, head gasket and exhaust manifold gasket surfaces may be machined. Port heights, widths and shapes may be changed. Ports may be added or deleted from cylinder. Cylinders may be machined to accept after-market cylinder liners. Epoxy-type filler material may be added to hollow pockets in the base gasket areas and in the port area. Repairs to cracked or damaged cylinders may be made provided only one damaged area affecting one cylinder bank has been repaired. Cylinders may be machined to accept girdle-type cylinder heads. Water cooling fittings may be added to cylinder. Exhaust power valve components and means of actuation may be modified or aftermarket.

- 25.5.7 **Cylinder Head:** Cylinder head may be modified or aftermarket.

- 25.5.8 **Gaskets:** Engine gaskets may be modified or aftermarket.

- 25.5.9 **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.
- 25.5.10 **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.

25.6 ENGINE - FOUR-STROKE

- 25.6.1 **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.
- 25.6.2 **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.
- 25.6.3 **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.
- 25.6.4 **Engine:** Engines may be bored. Aftermarket piston assemblies are allowed. Engine displacement must not exceed class designation (e.g., 1300cc in Pro-Am Runabout Open, 2000cc for Four-Stroke Open Boats, etc.).
- 25.6.5 **Engine Displacement Open Ski Classes:** For all Open Ski classes the displacement must not exceed 800cc for four-stroke watercraft.
- 25.6.6 **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.

- 25.6.7 **Engine Balancing Assemblies:** Engine balancing assemblies may be modified, aftermarket or removed.
- 25.6.8 **Rods:** Aftermarket connecting rods made of ferrous materials are allowed. Rod length may be changed.
- 25.6.9 **Exhaust System:** Exhaust system (i.e., manifold, connecting pipes, hoses, muffler(s), etc.) may be modified or aftermarket. Through-hull exhaust may be modified or aftermarket, provided that a hazard is not created. No tuned portion of the exhaust system may protrude outside of the hull. Exit location of the exhaust gases may be relocated to the transom below the bond flange of the boat.
- 25.6.10 **Cooling System:** The cooling system may be modified or aftermarket and additional cooling lines may be added. Aftermarket water bypass systems may be used. Cooling system bypass fittings may be modified or aftermarket and/or relocated, however, if relocated, the fittings must be directed downward and/or rearward so as not to create a hazard for other riders. Any valves that are used within the entire cooling system must be of the fixed type or automatic (e.g., thermostats, pressure regulators, solenoids, etc.). Manually controlled devices (by means of actuation) that alter the flow of cooling water during operation are not allowed. Original cooling system thermostat may be removed, modified or aftermarket. Cooling system flush kits are allowed.
- 25.6.11 **Oil Reservoir and Oil Pump:** Baffles in the oil reservoir may be modified. The addition of baffles in oil reservoir is allowed. Oil pump may be modified or aftermarket.
- 25.6.12 **Valve Cover:** The valve cover may be replaced for cosmetic purposes and/or weight reduction only.

25.7 AIR/FUEL DELIVERY - TWO-STROKE

- 25.7.1 **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.
- 25.7.2 **Fuel System:** The entire fuel system is a closed system. The watercraft must not vent or spill fuel at any attitude with or without the engine running. Original equipment fuel tank, fuel filler, and relief valve must be used and cannot be modified. The fuel pickup, fuel filter, and fuel petcock 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.
- 25.7.3 **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.
- 25.7.4 **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.

25.7.5 **Fuel Injection Systems:** Aftermarket fuel injection systems and components are allowed provided the following regulations are adhered to: High-pressure fuel hose meeting SAE J30R9 must be used; A.N. threaded-type fittings or equivalent and non-removable, crimped-type clamps must be used on the high-pressure portion of the system (i.e., hose clamps, 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.

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

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

25.8 AIR/FUEL DELIVERY - FOUR-STROKE

25.8.1 **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

25.8.2 **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 arrester and throttle body may be modified or aftermarket. Flame arrester mesh can not be removed or modified. Pre-filter flame arrester covers are allowed.

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

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

25.8.5 **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.

25.9 IGNITION AND ELECTRONICS - TWO AND FOUR-STROKE

- 25.9.1 **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.
- 25.9.2 **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.
- 25.9.3 **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.
- 25.9.4 **Temperature Sensor:** Engine temperature sensor assembly may be disconnected and/or removed.

25.10 TURBOCHARGER/SUPERCHARGER

- 25.10.1 **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.
- 25.10.2 **Intercooler:** Intercooler may be modified or aftermarket.
- 25.10.3 **Boost Valve:** Boost pressure-relief valve may be modified or aftermarket.
- 25.10.4 **Boost Sensor:** Boost sensor may be modified or aftermarket.

25.11 DRIVELINE AND PUMP

- 25.11.1 **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.
- 25.11.2 **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.
- 25.11.3 **Trim System:** Aftermarket nozzle trim systems may be used.
- 25.11.4 **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.

25.12 OPEN CLASS SUMMARY

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

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

25.13 COMMON REASONS FOR DISQUALIFICATION – OPEN

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

- 1) Missing tow strap.
- 2) Upper deck modifications.
- 3) Illegal hull modifications (inlet duct area main problem).
- 4) Bulk head modifications.
- 5) Watercraft weight less than allowed.
- 6) Displacement over the cc limit in rulebook.

RULE 26 - TECHNICAL RULES – MODIFIED CLASSES

26.1 OVERVIEW

26.1.1 Modified class competitors are allowed modifications to gain maximum machine and engine performance. Watercraft competing in a Modified class are allowed all Open class modifications listed in Rule 25 plus the additional specifications which follow.

26.2 SEATS

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

26.3 HULL

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

26.4 ENGINE

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

26.4.2 **Crankcases:** Crankcases may be interchanged between homologated watercraft of the same manufacturer. Crankcases must be of the same type (i.e., cylinder induction, crankcase induction or rotary valve induction) and number of cylinders as original equipment (no adding or deleting cylinders). Internal modifications to the fuel, oil and/or water exposed surfaces are allowed. Bearing and seal surfaces may not be modified. Filler material may be added to hollow pockets in the base gasket areas. Ignition/stator mounting area modifications are limited to spot facing, drilling and tapping threads for the purpose of mounting an after-market or modified ignition system. Additional carburetor pulse line fittings may be installed. Crankcase drain system may be removed