

RULE 24 - TECHNICAL RULES – LIMITED CLASSES

24.1 OVERVIEW

24.1.1 Limited classes give competitors an opportunity to perform additional modifications to their watercraft while still being able to compete with a relatively modest investment in equipment. The rules and regulations outlined in the Limited class section are in addition to all General Technical rules listed in Rule 22. All watercraft must remain strictly stock except where rules allow or require substitutions or modifications. Changes or modifications not listed in the rulebook are not permitted. Original equipment parts may be updated or backdated with original equipment parts of the same model. The part must be a bolt-on requiring no modifications to that part or any other parts except where rules allow substitutions or modifications. Watercraft competing in the Limited class must conform to the specifications which follow.

24.2 FOUR-STROKE SKI AND RUNABOUT DIVISION WATERCRAFT

24.2.1 **Special Rules:** Special rules apply to four-stroke turbo and supercharged watercraft for participation in Limited classes. Turbo/Supercharged four-stroke watercraft must run by Stock class rules (see Rules 22 and 23) in all Limited classes with the exceptions outlined below.

24.2.2 **Ski Division Only - Electronic Control Unit (ECU):** The original electronic control unit may be modified or aftermarket so long as it does not offer any additional inputs or outputs than the original unit, and it must connect with the original connections. The modified or aftermarket ECU must not produce more than 14lbs of boost. No additional sensors may be added (e.g., exhaust gas temperature, detonation sensors, etc.). Engine temperature sensors may be disabled. ECU may not be programmed to alter the original function of the OEM controls and or switches.

23.3.3 **Ski Division Only - Boost Regulator Value: The APBA requires all four-stroke turbocharged watercraft to run an APBA approved boost regulator valve set at 14psi of boost.**

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

24.2.5 **Runabout Division Only - Pump Nozzle and Trim System: 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 trim-nozzle systems may be used.**

24.2.6 **Runabout Division Only -** The original electronic control unit may be modified or aftermarket so long as it does not offer any additional inputs or outputs than the original unit, and it must connect with the original connections. No additional sensors may be added (e.g., exhaust gas temperature, detonation sensors, etc.). Engine temperature sensors may be disabled. ECU may not be programmed to alter the original function of the OEM controls and or switches.

24.2.7 **Runabout Division Only - Turbo/Supercharger Impeller:** Modifications in this rule are not allowed to be made on a PWC that has been modified subject to rule 24.2.8. Turbocharger impeller or supercharger impeller may be modified or aftermarket. The impeller housing must remain stock as supplied by the manufacturer.

24.2.8 **Runabout Division Only - Camshafts and Valves:** Modifications in this rule are not allowed to be made on a PWC that has been modified subject to rule 24.2.7. Camshafts may be modified or aftermarket. Valves may be modified or aftermarket. Valve seats may be modified. Springs may be modified or aftermarket. Pushrods may be modified or aftermarket. Replacement valves, pushrods, and seats may not be titanium unless originally equipped.

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

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

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

24.4 HULL

24.4.1 **Trim Tabs/Plates:** Aftermarket fixed position trim tabs may be used. Original equipment trim plates that are detachable from the hull may be removed or replaced when installing aftermarket trim tabs. Trim tabs cannot exceed the width of the planing surface or extend rearward more than 3.94 inch (100.00mm) beyond the end of the original planing surface. Manual or automatic trim tabs attached to the hull or ride plate are not allowed. All hull extensions mounted on the hull's transom will be considered as a trim tab. All edges must be radiused so as not to create a hazard. Fins, skegs, rudders and other appendages that may create a hazard are not allowed.

24.4.2 **Hood Modifications - Ski Division Only:** Minor internal modifications to the hood, in order to fit an aftermarket exhaust pipe will be allowed. No other modification will be allowed (i.e., no additional ventilation, etc.). Modifications will be subject to Race Director or Technical Directors' approval.

24.4.3 **Engine Compartment Foam Removal:** Engine compartment foam may be removed, modified or aftermarket. Only floatation foam within the engine compartment may be removed. Only foam that can be removed without modification to any other part or parts, except where rules allow the parts to be modified, is allowed. Parts may not be relocated based on the removal of the foam. The hull's inner liner or deck may not be cut or modified to remove foam. Removal of foam between layers of the hull and/or deck is not allowed.

24.4.4 **Ventilation:** Engine compartment ventilation tubes may be modified, aftermarket, relocated on the original equipment ducting, or removed. Inlet and outlet openings may not be enlarged (i.e., when the tube is removed, the opening may not be larger than stock). Vents may be shielded or plugged. No other modifications to the hood is allowed.

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

24.5 ENGINE - TWO STROKE

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

24.5.2 **Engines:** Engines may be bored. Replacement piston assemblies may be used provided the original port timing, compression ratio, dome profile, skirt length and shape and type of material are not changed. Non-conforming pistons (i.e.: skirt shape that is not an exact replica of the OEM piston) may be approved by the APBA but such approval must be obtained in writing. Replacement piston assemblies must weigh within $\pm 25.00\%$ of original equipment. Chamfering of cylinder ports must not exceed 1.00mm (0.04 in.) at a 30 degree maximum angle. Cylinders may be machined to accept girdle system cylinder heads.

24.5.3 **Gaskets:** Replacement gaskets may be used but must be of the same type (e.g., sheet, o-ring, etc.) as their OEM counterparts. Replacement base gaskets must not be thicker than 1.52 mm (0.060 in). Replacement head gaskets shall be allowed a tolerance of up to 0.005 mm (0.002 in) thinner than the original OEM head gasket and up to 1.5mm (0.06 in) thicker than the original OEM head gasket. All other gaskets shall be allowed a tolerance of plus or minus 20%. Modifications to the head and exhaust manifold to head pipe gaskets is allowed. Additional holes may be added or subtracted. All other gaskets must have the same OEM pattern. All gaskets must meet the thickness and tolerances as outlined in the rule. Yamaha SuperJets may use a stock OEM Waveblaster II metal gasket.

24.5.4 **Engine Displacement:** Engine displacement must not exceed class designation. Exceptions – Maximum allowable cc over class designation may not exceed 803cc for the 800cc Limited Ski classes.

24.5.5 **Crankshaft:** The crankshaft may be rebuilt using replacement counterweights, crank pins, bearings and connecting rods. Counterweights, crank pins and connecting rods made of non-ferrous metals are not allowed. Stroke and rod length may not be changed. Counterweights on non-rebuildable style crankshafts may be machined to accept a press-through crank pin. Replacement bearings must maintain their original type and dimensions. Replacement counterweights must resemble the original part (i.e., holes and/or pockets not existing on the original part may not be on the replacement part). The total weight of the crankshaft assembly must be within $\pm 5.00\%$ of the original equipment weight. Crankpins may be welded and/or keyed to the counterweights.

24.5.6 **Cylinders:** Cylinders may be interchanged between watercraft of the same manufacturer. This rule is an exception to Rule 24.1.1.

- 24.5.7 **Engine Cases – Cylinder Modifications:** No internal modifications of any kind, including grinding, surfacing, polishing, machining, shot peening, etc., will be allowed on any engine components.
- 24.5.8 **Cylinder Head:** Cylinder head and gasket may be modified or aftermarket.
- 24.5.9 **Exhaust System:** Exhaust manifold, head pipe, expansion chamber, gaskets and hose between expansion chamber and OEM waterbox may be modified/altered or aftermarket. Exhaust location of the exhaust gases may not be relocated. Original size opening must be maintained for exhaust exit. Original equipment waterbox must be used and may not be modified. No tuned portion of the exhaust shall protrude outside the hull. Through-hull exhaust outlet flap may be removed.
- 24.5.10 **Resonator:** Resonator may be bypassed or removed. Original Waterbox/muffler must be used. Replacement hose/tubing from the waterbox to exit is allowed provided the OEM exit location is maintained.
- 24.5.11 **Cooling System:** The cooling system may be modified or aftermarket and additional cooling lines may be added. Aftermarket water bypass systems may be used. Cooling system bypass fittings may be modified or aftermarket and/or relocated, however, if relocated, the fittings must be directed downward and/or rearward so as not to create a hazard for other riders. Any valves that are used within the entire cooling system must be of the fixed type or automatic (e.g., thermostats, pressure regulators, solenoids, etc.). Manually controlled devices (by any means of actuation) that alter the flow of cooling water during operation are not allowed. Original cooling system thermostat may be removed, modified or aftermarket. Cooling system flush kits are allowed.

24.6 ENGINE - 4-STROKE NON TURBO/SUPERCHARGED ONLY

- 24.6.1 **Engines:** Engines may be bored. Replacement piston assemblies may be used provided the original port timing, compression ratio, dome profile, skirt length and shape and type of material are not changed. Replacement piston assemblies must weigh within $\pm 25.00\%$ of original equipment. Engine displacement must not exceed class.
- 24.6.2 **Crankshaft:** The crankshaft may be rebuilt or replaced provided by the following: Counterweights and material type must maintain the shape and dimensions as provided by the manufacturer. Stroke and rod lengths may not be changed. Counterweights may be deburred to remove only casting flaws, no other machining or knife edging of counterweights are allowed. Rod journals must maintain their OEM diameters/dimensions. Main journals must maintain their OEM diameters/dimensions. Cross drilling of the crankshaft to improve oil flow or redirection is allowed. Replacement bearing shells are allowed provided the following: maximum allowable undersized bearing is .060 inch (1.5mm). Total weight of the crankshaft assembly must be within $\pm 5\%$ of the original equipment weight. Damaged rod or main journals may be welded and machined to their OEM dimensions or within the allowable bearing sizes.
- 24.6.3 **Crankcase Repairs:** Repairs to cracked or punctured crankcases may be made provided only one damaged area affecting one cylinder bank has been repaired. Crankcase drain and cable may be removed and plugged. No other modifications or repairs are allowed.

- 24.6.4 **Cooling System:** Aftermarket cooling lines and water bypass systems may be used. Additional cooling supply lines and fittings may be added to the pump. Bypass fittings may be modified, aftermarket and/or relocated but must be directed downward and/or rearward so as not to create a hazard for other riders. Any valves used within the entire cooling system must be of the fixed type or automatic (e.g., thermostats, pressure regulators, solenoids, etc.). Manually controlled devices (by any means of actuation) that alter the flow of cooling water during operation are not allowed. Cooling system flush kits are allowed.
- 24.6.5 **Camshafts:** Camshafts may be modified or aftermarket.
- 24.6.6 **Valves and Components:** Valves may be modified or aftermarket. Valve seats may be modified. Springs may be modified or aftermarket. Pushrods may be modified or aftermarket. Replacement valves, pushrods, and seats may not be titanium unless originally equipped.
- 24.6.7 **Resonator:** Resonator may be bypassed or removed. Original Waterbox/muffler must be used. Replacement hose/tubing from the waterbox to exit is allowed provided the OEM exit location is maintained.

24.7 AIR/FUEL DELIVERY - TWO STROKE

- 24.7.1 **Carburetor:** Carburetor(s) may be modified or aftermarket provided they do not vent or spill fuel at any attitude with or without the engine running. The number of venturis cannot exceed the number of cylinders. No slide-type carburetors. Aftermarket primer may be used. Intake manifold assembly may be modified or aftermarket. Aftermarket crankcase-pressure-operated fuel pumps may be used. Additional carburetor pulse line fittings may be installed on the crankcase.
- 24.7.2 **Fuel System:** The entire fuel system is a closed system. The watercraft must not vent or spill fuel at any attitude with or without the engine running. Original equipment fuel tank, fuel filler and relief valve must be used and cannot be modified. The fuel pickup, fuel filter and fuel petcock assembly may be removed and/or after-market parts may be used. Additional fuel filters may be used and fuel cell foam may be added to the original equipment fuel tank. Fuel tank filler cap may be modified or aftermarket provided a hazard is not created.
- 24.7.3 **Vapor Separators:** Vapor/Air Separators may be modified or aftermarket provided they do exceed 2 inch x 6 inch and must have a return line to the fuel tank open at all times. Additional fuel reservoirs may not be used.
- 24.7.4 **Fuel Pumps:** Aftermarket or modified electric fuel pumps, not exceeding 4psi, may be used. When the engine stops or is shut off, the fuel pump must automatically stop. No manually operated on/off-type fuel pumps are allowed.
- 24.7.5 **Fuel Injection Systems:** Aftermarket fuel injection systems and components are allowed provided the following regulations are adhered to: High-pressure fuel hose meeting SAE J30R9 must be used; A.N. threaded-type fittings or equivalent and non-removable, crimped-type clamps must be used on the high-pressure portion of the system (i.e., hose clamps, tie wraps, etc. are not allowed); only metal-type fuel filters may be used on the high-pressure portion of the system; all other in-line filters must be installed on the low-pressure portion of the system.

- 24.7.6 **Flame Arrestor:** 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 will be allowed. Intake silencer may be removed. Flame arrester mesh can not be removed or modified. Pre-filter flame arrester covers are allowed.
- 24.7.7 **Reed and Rotary Valves:** Reed valve assemblies may be modified or aftermarket. Rotary valve may be modified or aftermarket.

24.8 IGNITION AND ELECTRONICS - TWO-STROKE

- 24.8.1 **Ignition:** RPM limiter function may be bypassed or eliminated. CDI unit may be modified or aftermarket. Ignition timing may be changed. Modifications to the original equipment ignition pickup mount will be allowed. Original equipment charging system must be used. No other ignition system modifications will be allowed.
- 24.8.2 **Flywheel Cover:** Flywheel cover may be modified to accept a crankshaft-end bearing support.
- 24.8.3 **Engine Temperature Sensor:** Engine temperature sensor may be disconnected and/or removed.
- 24.8.4 **Relocation of Battery Box:** Relocation of the battery box is allowed in order to fit an aftermarket exhaust system provided the relocated battery box and battery are securely fastened.
- 24.8.5 **Relocation of Electrical Components:** Relocation of electrical components (e.g., box or housing) is allowed in order to fit an aftermarket exhaust system (only the strict minimum needed). Modification will be subject to the Technical Directors' approval.

24.9 DRIVELINE

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

24.10 LIMITED CLASS SUMMARY

- 24.10.1 The items listed below need not be OEM for participation in the Limited classes. See specific class rules for more details and specifications.
- 1) Engine Gaskets
 - 2) Flywheel Key

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

24.11 COMMON REASONS FOR DISQUALIFICATION – LIMITED

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

- 1) Missing tow loop.
- 2) Cylinder ports have been modified beyond tolerable limits.
- 3) Cylinder sleeve modifications.
- 4) Case decking.
- 5) Rod length changes.
- 6) Flame arrestor mesh has been removed or modified.
- 7) Aftermarket or lightened flywheel.
- 8) No rubber nose bumper.
- 9) Additional hull or hood ventilation for increased airflow to engine.

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

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.