

## 17 SKI MOD LITES CLASS

### 17.1 SKI MOD LITES CLASS COMPETITION

Intended to promote interest in personal watercraft competition with a limited performance level while having access to performance parts available from the aftermarket industry. Watercraft competing in this class must conform to the specifications which follow.

**DISPLACEMENT:** The maximum displacement for Ski equipped with Two Stroke engines is 850 CC. The maximum displacement for Ski equipped with normally aspirated Four Stroke engines is 1100 CC.

Kawasaki 1500 SX-R Ski, built to Superstock specifications may be used in Mod Lites when an IJSBA approved restrictor plate is used.

**ONLY OEM HOMOLOGATED NATURALLY ASPIRATED ENGINES ARE ALLOWED IN MOD LITES.**

- 17.1.1 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. brackets, fittings, etc.) that have known failure risks in race conditions. Such changes will only be allowed if the changes 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

- 17.1.2 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.

**Note:** Pre-1996 Yamaha SuperJet may update to 1996 and newer engine components and waterbox. Kawasaki JS750SX and SXi may update to SXi Pro engine components and waterbox.

- 17.1.3 Sound level shall not exceed 86 dB(a) at 22.86m (75 ft.).
- 17.1.4 Engine fuel must consist of gasoline meeting the criteria defined in Section 34.4.

### 17.2 HULL

- 17.2.1 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.

- 17.2.2 The top deck may be modified or aftermarket, providing the following: The top deck must resemble the generic look of existing homologated Ski watercraft. The generic look may include legal aftermarket components which are integrated into the deck (i.e., rail caps and foot holds). All hulls and top decks must be approved by the IJSBA through the Aftermarket Hull Homologation Process.

Decks 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 Appendix.)

If the watercraft is equipped with footwells, the footwells must be blocked off, during competition, allowing no indentation into the footwell sides.

- 17.2.3 Aftermarket hoods may be used.

- 17.2.4 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 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.) Sponsons may be attached to the inside of the bond flange, but no part of the sponson may extend more than 38.00mm (1.500 in.) below the lower part of the bond flange (bumper removed). Sponsons attached to the inside of the bond flange shall not protrude outside the bond flange (bumper removed) when measured in a level horizontal plane.

The decision of the Technical Director and/or Race Director regarding modifications will be final. Any question regarding the legality of modifications should be directed to the IJSBA or IJSBA affiliate prior to use in competition.

- 17.2.5 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.

- 17.2.6 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 100.0mm (3.94 in.) beyond the end of the original equipment plate for Ski and Sport Division or 177.80mm (7.00in) 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 Appendix.)
- 17.2.7 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.
- 17.2.8 Replacement bumpers may be used provided a hazard is not created.
- 17.2.9 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 mouldings as measured by a plumb line.
- 17.2.10 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.
- Handlepole (and mounting bracket) may be modified or aftermarket provided it functions as originally designed. Handlepole attaching point may be reinforced.
- 17.2.11 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.
- 17.2.12 Original bilge pump may be modified or disconnected. Aftermarket bilge draining systems that do not create a hazard are allowed.
- 17.2.13 Handles, drop-in type storage buckets, bolt-on type mirrors and gauges may be modified, aftermarket or removed provided a hazard is not created. Drop-in type buckets are defined as being able to be removed without the use of any tool. Other than for the use of fasteners and the placement of allowable relocated parts (i.e., ECU), the bulkhead may not be modified.

- 17.2.14 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.
- 17.2.15 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.
- 17.2.16 Handles, drop-in type storage buckets, bolt-on type mirrors and gauges may be modified, aftermarket or removed provided a hazard is not created. Drop-in type buckets are defined as being able to be removed without the use of any tool. Other than for the use of fasteners and the placement of allowable relocated parts (i.e., ECU), the bulkhead may not be modified.
- 17.2.17 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.

### **17.3 ENGINE – TWO-STROKE**

- 17.3.1 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.) Cylinders may be machined to accept girdle system cylinder heads.
- 17.3.2 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.
- 17.3.3 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.
- 17.3.4 External modifications to the engine finish (e.g., plating, polishing and/or painting) are allowed for cosmetic purposes only.

- 17.3.5 No internal modifications of any kind, including grinding, surfacing, polishing, machining, shot peening, etc., will be allowed on any engine components.
- 17.3.6 Cylinder head and gasket may be modified or aftermarket.
- 17.3.7 Exhaust manifold, head pipe, expansion chamber, gaskets and hose between expansion chamber and 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. No tuned portion of the exhaust shall protrude outside the hull. Through-hull exhaust outlet flap may be removed. Two Stroke and Four Stroke Runabout Limited classes: Removal of the plastic resonator is allowed.
- 17.3.8 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.
- 17.3.9 Replacement starter motor and bendix may be used.
- 17.3.10 Replacement engine mounts may be used.
- 17.3.11 Oil-injection system may be disconnected or removed.
- 17.3.12 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.
- 17.3.13 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.

If the OEM cylinders, or the allowed replacement cylinders, do not provide for a displacement within 10% of the maximum allowable displacement then an aftermarket cylinder sleeve may be utilized. The aftermarket sleeve must maintain the same port sizes and specifications as the original OEM cylinder sleeve.

**17.4 AIR/FUEL DELIVERY — TWO-STROKE**

- 17.4.1 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.
- 17.4.2 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.
- 17.4.3 Aftermarket fuel-injection systems and components are allowed provided the following regulations are adhered to: Highpressure fuel hose meeting SAE J30R9 must be used; A.N. threadedtype 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 lowpressure 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.
- 17.4.4 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. 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.
- 17.4.5 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.
- 17.4.6 Reed valve assemblies may be modified or aftermarket. Rotary valve may be modified or aftermarket

**17.5 IGNITION AND ELECTRONICS — TWO-STROKE**

- 17.5.1 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.
- 17.5.2 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.
- 17.5.3 Flywheel cover may be modified to accept a crankshaft-end bearing support.
- 17.5.4 Replacement batteries are allowed but must fit into the original equipment battery box and be securely fastened.
- 17.5.5 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

**17.6 DRIVELINE – TWO-STROKE**

- 17.6.1 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.
- 17.6.2 Aftermarket nozzle-trim systems may be used.
- 17.6.3 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.
- 17.6.4 Couplers, bearing housing and driveshaft may be modified or aftermarket provided they maintain a 1:1 drive ratio between the engine and the pump.

**ENGINE- FOUR STROKE**

- 17.6.5 Engines may be bored. Replacement piston assemblies may be used provided 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. Cylinder head combustion chambers may be cleaned by bead blasting with valves seated in place. Intake and exhaust ports may not be bead blasted or cleaned with abrasive material such as steel wool or Scotch-Brite®. Repairs to the cylinder head affecting one cylinder bank are allowed.

The maximum displacement that may be achieved on a naturally aspirated Four Stroke engine, in Ski Mod Lites, is 1100cc.

- 17.6.6 Repairs may be made to cracked or damaged cylinders by installing a cylinder sleeve. The head gasket surface of the cylinder block may be machined only to allow for the installation of the new sleeves (see appendix for description). A thicker head gasket must be utilized to return the block deck height to within .155mm (.06in) of original height. The repair must offer no additional performance gains. Cylinders that are originally coated with Nikasil, or similar coating, may be replated, with Nikasil, or an approved replacement material, when repaired.
- 17.6.7 Crankshaft must remain stock. Replacement bearings or bearing shells are allowed, providing they maintain their original type and dimensions.
- 17.6.8 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.
- 17.6.9 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.
- 17.6.10 Engine water cooling systems may be modified or aftermarket. Additional water cooling lines and after market 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. Water inlet covers that are removable from the engine block may be modified or aftermarket. OEM dry fittings that tap into the water jacket may be modified or aftermarket and may accept water so long as the OEM opening is not enlarged. 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.
- 17.6.11 Valve cover may be modified or replaced for cosmetic purposes and/or weight reduction only.



- 17.6.12 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. 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.
- 17.6.13 Exhaust manifolds that have previously been drilled or tapped may be used so long as the holes are filled or capped.
- 17.6.14 No internal modifications of any kind, including grinding, surfacing, polishing, machining, shot peening, etc., will be allowed on any engine components.
- 17.6.15 Replacement starter motor and bendix may be used.
- 17.6.16 Replacement engine mounts may be used.
- 17.6.17 IJSBA Approved aftermarket valves, valve springs, and valve spring retainers may be used.

## **17.7 AIR/FUEL DELIVERY — FOUR-STROKE**

- 17.7.1 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.
- 17.7.2 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.

**17.8 DRIVELINE -- FOUR STROKE**

- 17.8.1 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.
- 17.8.2 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.).