**11.3.4** Any 15-year-old who has completed 16 heats of racing in the 1.5-litre stock class is eligible to race in the 2.5 Stock class and 1-liter modified class but must follow the rules pertaining to any new driver Rule 11. **Any 17-year-old who has completed 40 heats of racing in the 2.5 stock (S/F) is eligible to race in the E350 (E/H) or 2.5 Mod (A) class but must follow rules pertaining to any new driver rule 11. Proof of racing heats is the responsibility of the driver.**

## RULE 39 - CLASS RACING INFORMATION

### 39.1 HYDRO AND RUNABOUT CLASSES ~~(NEW AS OF 2/13/2020)~~

| CLASS | LETTER | MIN AGE | MAX PER HEAT | MIN LENGTH | MAX LENGTH | MAX WIDTH | WEIGHT W/DRIVER LBS | 4 LEG SLING MIN WT PER LEG LBS (TOTAL MIN RATING) | 3 LEG SLING 1.5xMIN WT PER LEG LBS | 2 LEG SLING 2xMIN WT PER LEG LBS | 1 LEG SLING 2.5xMIN WT PER LEG LBS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 LITRE | Y | 16 * | 12 | 13'6" | | | 825 | 825 (3300) | 1238 (3714) | 1650 (3300) | 2063 |
| | | | | 14' | 17'6" | 9'6" | 825 | 825 (3300) | 1238 (3714) | 1650 (3300) | 2063 |
| 1.5LITRE STOCK | T | 13 | 12 | 13'6" | | 9'6" | 825 | 825 (3300) | 1238 (3714) | 1650 (3300) | 2063 |
| 2.5LITRE STOCK | S OR F | 16* | 12 | 13'6" | 17'6" | 9'6" | 1025 | 1025 (4100) | 1538 (4614) | 2050 (4100) | 2563 |
| 2.5LITRE STOCK As a Legal Step Up to 2.5 Mod | S OR F | 16 | 12 | 13'6" | 17'6" | 9'6" | 1025 | 1025 (4100) | 1538 (4614) | 2050 (4100) | 2563 |
| 2.5 LITRE MOD | A | 18 | 10 | 148.5 CID 13'6" | X | X | 1025 | 1025 (4100) | 1538 (4614) | 2050 (4100) | 2563 |
| | | | | 148.5 CID METHANOL | X | X | 1125 | 1125 (4500) | 1688 (5064) | 2250 (4500) | 2813 |
| | | | | 16'/ 155.5 CID | X | X | 1225 | 1225 (4900) | 1838 (5514) | 2450 (4900) | 3063 |
| | | | | 16'/ 166 CID | X | X | 1325 | 1325(5300) | 1988 (5964) | 2650 (5300) | 3313 |
| E350 | E OR H | 18 | 10 | 16' | 21' | 11' | 1525 | 1525 (6100) | 2288 (6864) | 3150 (6100) | 3813 |
| NATIONAL MODIFIED | NM | 18 | 8 | 17' 155 CID | | | 1225 | 1225 (4900) | 1838 (5514) | 2450 (4900) | 3063 |
| | | | | 17' 166 CID | | | 1325 | 1325 (5300) | 1988 (5964) | 2650 (5300) | 3313 |
| | | | | 17' 246 CID | | | 1350 | 1350 (5400) | 2025 (6075) | 2700 (5400) | 3375 |
| | | | | 19' 308 CID | | | 1900 | 1900 (7600) | 2850 (8550) | 3800 (7600) | 4750 |
| | | | | 19' 368 CID | | | 1900 | 1900 (7600) | 2850 (8550) | 3800 (7600) | 4750 |
| | | | | 18' 368 CID | BUILT BEFORE 10/30/87 | | 1600 | 1600 (6400) | 2400 (7200) | 3200 (6400) | 4000 |
| GRAND NATIONAL HYDROPLANE | GNH | 18 | 8 | 20' | | | 2000 | 2000 (8000) | 3000 (9000) | 4000 (8000) | 5000 |
| | | | | 20' | BUILT ON OR AFTER 11/1/97 | | 2200 | 2200 (8800) | 3300 (9900) | 4400 (8800) | 5500 |
| | | | | 20' | 26' | 511 CID | 2500 W/O DRIVER | 2500 (10000) | 3750 (11250) | 5000 (10000) | 6250 |
| GRAND PRIX | GP | 18 | 8 | 23' BUILT BY 12/31/07 | 26' BUILT BY 12/31/07 | 12'9" | 2700 W/O DRIVER | 2700 (10800) | 4050 (12150) | 5400 (10800) | 6750 |
| note: max length 26'8" if before Jan. 2010 | | | | 24' BUILT AFTER 12/31/07 | 26' BUILT AFTER 12/31/07 | 12'6" | 2700 W/O DRIVER | 2700 (10800) | 4050 (12150) | 5400 (10800) | 6750 |
| CRACKER BOX | P | 16 | 8 | 15'6" | | | 1250 W/O DRIVER / RIDER | 1250 (5000) | 1875 (5625) | 2500 (5000) | 3125 |
| JERSEY SPEED SKIFF | JSS | 16 DRV 14 RIDER | 8 | 16' | | min width 6' | 1650 W/O DRIVER / RIDER | 1650 (6600) | 2475 (7425) | 3300 (6600) | 4125 |
| SUPER STOCK | SS | 16 | 12 | 16' | | min width 6' | 1950 | 1950 (7800) | 2925 (8775) | 3900 (7800) | 4875 |
| SPORTSMAN ENTRY | SE | 16 | | 16' | | min width 6' | 1850 | 1850 (7400) | 2775 (8325) | 3700 (7400) | 4625 |
| SPORTSMAN ADVANCED | SA | 16 | 10 | | | | 1850 | 1850 (7400) | 2775 (8325) | 3700 (7400) | 4625 |
| KRR | K | 21 | 8 | | | | 2250 | 2250 (9000) | 3375 (10125 | 4500 (9000 | 5625 |
| PRO STOCK | PS | 16 | 10 | 16' | 20' | 6' | 1950 | 1950 (7800) | 2925 (8775) | 3900 (7800) | 4875 |
| *SEE RULE 11.4.3 | | | | | | | | | | | |

****I can't update the chart because it's saved as an image. Need to add an asterisk to both the 2.5 Mod and E350 min age limits. Also need to change "SEE RULE 11.4.3" to 11.3.4****

**43.6.3** Bore 3.825 maximum and stroke 3.126 maximum~~. Top of piston must be below the top surface of the compressed head gasket a minimum of 0.040.~~

**43.6.5.1 – Head option 1:** Esslinger Ford Aluminum D-port, Ford part number M-6049-E23A. Heads must have the official ABPA or ACHA stamps on at all times. Head must remain unaltered in any way except for the following: Casting and machining mismatch in the area under the valve cover may be contoured to allow for better oil return. No changes are permitted in the valve area. Combustion chamber **volume and compressed head gasket minimums: At 61cc the top of the piston must be below the top surface of the compressed head gasket a minimum of 0.040", at 60cc the top of the piston must be below the top surface of the compressed head gasket a minimum of 0.046".** Intake and Exhaust valve seats may be reworked (valve job) but touching and/or altering the aluminum part of the bowl is prohibited.

**43.7.2** Check combustion chamber: Minimum distance from top ring to the top of the piston: Federal Mogul: 0.245", SRP: 0.195". **At 61cc the top of the piston must be below the top surface of the compressed head gasket a minimum of 0.040", at 60cc the top of the piston must be below the top surface of the compressed head gasket a minimum of 0.046".** Top of piston must be below the top surface of the compressed head gasket a minimum of 0.040". Cylinder head chamber volume 61cc minimum. Dual plug heads or roller rocker arms are prohibited.

**49.3.4** Pistons can be any manufacturers cast or forged replacement that must meet the following specification. The piston must have flat tops, four (4) or two (2) valve recesses and meet stock dimensions. Wrist pins must meet stock dimensions and weights. No pistons are to be machined in any way other than for clearancing of wrist pins or balancing (wrist pin bosses or back side of piston tops). Tops of pistons may be machined to obtain minimum deck height of 20 thousandths (top of piston to top of first ring, not to be less than 245 thousandths). Any full complement of rings may be used provided no alteration is done to the ring grooves in pistons. Pistons may be rotated 180 degrees in the cylinder.

**Rods must be stock forged steel (5.7 inches in length). Flashing removal, shot-peening and polishing of rods is permitted. Any stock replacement rod bolt and nut that fits without machining or drilling may be used. Any replacement bearings, rod and main may be used. In addition to the above, the following press fit rods may be used Manley Rod #14109A-8, Scat Pro Stock Rod # 2-ICR5700-2000P, Eagle SIR # SIR5700SPLW along with floating rods Manley Rod # 14105, Scat Pro Stock Rod # 2-ICR5700-2000, Eagle SIR # SIR5700SBLW may also be used. No changes or alterations can be made to the Manley, Scat or Eagle rods. This includes balancing.**

**49.4.4** Pistons and Rods - Pistons can be any manufacturers cast or forged replacement that must meet the following specifications. The piston must have flat tops, four (4) or two (2) valve recesses and must meet stock dimensions. Wrist pins must meet stock dimensions and weights. No pistons are to be machined in any way other than for clearancing of wrist pins or balancing (wrist pin bosses or back side of piston tops). Tops of pistons may be machined (top of piston to top of first ring, not to be less than 245 thousandths). Any brand of full complement of rings must be used provided no alteration is done to the ring grooves in pistons (piston ring thickness must meet the stock specs of 5/64, 5/64, 3/16ths). Pistons may be rotated 180 degrees in the cylinder.

Rods must be stock forged steel (5.7 inches in length). Flashing removal, shot-peening and polishing of rods is permitted. Any stock replacement rod bolt and nut that fits without machining or drilling may be used. Any replacement bearings, rod and main may be used. In addition to the above, **the following press fit rods may be used** Manley Rod #14112A-8, Scat Pro Stock Rod # 2-ICR5700P, Eagle SIR # SIR5700BPLW **along with floating rods Manley Rod # 14101, Scat Pro Stock Rod # 2-ICR5700, Eagle SIR # SIR5700BBLW** may also be used. No changes or alterations can be made to the Manley, Scat or Eagle rods. This includes balancing.

**3.12 RESTRAINT CAPSULES:**

***3.12.1*** *The general term "Restraint Capsule" encompasses all the following type capsules that protect a restrained driver. For specific restraint capsule guidelines, refer to the guidelines for the construction of all Restraint Capsules that are available from the Inboard Office.*

Type 1 - Capsules constructed of steel tube with water deflection without canopy. Type 1 capsules are not to be used in new hydroplane construction after November 1st, 2011.

Type 2 - Capsules constructed of composite materials without a canopy.

Type 3 - Capsules constructed of composite materials fitted with canopy which is not designed to withstand a hard impact.

Type 4 - Capsules constructed of composite materials reinforced with a steel or composite tubing roll cage fitted with structural canopies and bottom hatches (**Flatbottom hulls are not required to have a bottom hatch)** designed to withstand a hard impact.

**BOAT SAFETY Rules - (Remove all italics) – Not in General Racing Rules**

**Current Safety Collar Rule**

3.7.1 A safety collar on the propeller shaft, within 0.5 inches of the leading end of the strut or a safety collar within 0.5 inches of the shaft log assembly, is mandatory on all runabout classes. Safety collars must be configured so they will prevent the shaft and propeller from sliding back and hitting the rudder should the thrust bearing come apart or loose on the shaft. The safety collar must have two set screws or be of the split-type configuration**.** If placed forward of the thrust bearing, the collar must be larger than the bearing. Couplers between the gearbox shaft and the propeller shaft on runabouts shall be a minimum of 4.75 inches long and utilize a minimum of 5 clamping bolts. Set screws shall be used in each end of the coupler. Each shaft shall be dimpled to receive set screws. Safety collars in all classes shall be machined from bar stock, not pressed metal (sintered iron).

**Proposed Safety Collar Rule**

**3.7.1 Propeller shaft safety collars.** Safety collars in all classes shall be machined from bar stock, not pressed metal (sintered iron). In runabout classes, safety collars must be configured so they will prevent the shaft and propeller from sliding back and hitting the rudder should the thrust bearing come apart or loose on the shaft. They must be located within 0.5 inches of the leading end of the strut or within 0.5 inches of the shaft log assembly. Couplers between the gearbox shaft and the propeller shaft on runabouts shall be a minimum of 4.75 inches long and utilize a minimum of 5 clamping bolts. Set screws shall be used in each end of the coupler. Each shaft shall be dimpled to receive set screws. **In Inboard classes the safety collar for smooth round propeller shafts must be of the split-type configuration or have two set screws and the shaft shall be dimpled to receive those screws. If placed forward of the thrust bearing, the collar must be larger than the bearing. A splined propeller shaft with a grooved undercut to receive two axial restraint bolts can also be used with a splined safety collar.**

**Remove current Rule 45.5**

**45.5** Chrysler 273 cu. in. engine may also be used. Complete specifications available from Inboard Office.

**No one runs this and there are no specifications available from the Inboard Office.**

45.5 **General Motors LS – LM7 5.3 Liter Engine**. Engine must be a (1999 thru 2007) General Motors LS-LM7-5.3L/325cid-Cast Iron Block. Grinding, polishing, or blasting any internal part that results in smoothing, recontouring or enlarging is prohibited. Parts must be used as furnished by General Motors. Alterations are not permitted except as specified herein.

45.5.1 **Engine Parameters:** Maximum displacement: 328 cubic inches, Maximum Compression Ratio: 9.5:1

45.5.2 **Block**: Must be a stock cast iron production General Motors V-8 style block. Aluminum versions of this block are not allowed. Casting Numbers:12567392,12567393,12551358 only. Identification numbers may not be removed. No grinding or lightening allowed. Stock Bore: 3.780 in. Stroke: 3.622 in. Deck Ht: 9.230-9.240 in. Maximum Bore: 3.800 in. This allows the use of .020" oversized pistons. A maximum of three cylinders bores and/or a maximum of seven lifter bores may be sleeved (no indexing lifter bores)

45.5.3 **Crankshaft**: Must be GM OEM cast iron, 24x reluctor wheel crankshaft or aftermarket replacement matching OEM specifications. Steel magnetic crankshafts only. Unaltered in any way except for normal cleanup and balancing. Keying or pinning of the crankshaft to avoid coupler slipping is allowed and recommended. May not be contoured or sculptured. Stock aftermarket "as cast" (over the counter) "knife edge" from major manufacturer is allowed. No modifications after purchase are allowed. MINIMUM Crankshaft Weight: 51Lbs including balancing

45.5.3.1 OEM CRANKSHAFT SPECIFICATIONS: 3.622 in. stroke. 3.550 in. main journal 2.100 rod journal.

45.5.4 **Connecting Rods**: OEM: Powdered Metal, I-Beam shape. Rod Length must be: 6.098 in. Wrist Pin Bore: 0.944" Big End Bore: 2.2300". Aftermarket, forged I-beam or H-beam rods matching stock 6.098 in length allowed. MINIMUM Connecting Rod Weight: 595 grams including cap, bolts & nuts.

45.5.5 **Pistons**: Any OEM style piston may be used as long as maximum compression ratio is not exceeded. Pistons must remain in stock configuration. Piston skirt must be a full round. No FSR style pistons. No portion of the piston may protrude above the top of the block (measurement excludes head gaskets). No gas porting of piston ring lands and no top of piston coating of any kind. Ring lands must remain in standard location. The weight of each piston should not be less than 590 grams including the wrist pin and ''C'' clips and rings. OEM Piston Specifications: Hypereutectic Cast Aluminum alloy; Dished top without valve reliefs .068" x 3.050"; Piston Volume +8cc; Wrist Pin (1999-2004): 0.9447 in.,0.9448 in. (Pressed) Wrist Pin (2005-2007) 0.9429 in., 0.9431 in. (Floating).

45.5.6 **Piston Rings**: OEM Cylinder Bore: 3.779 in. (up to 0.020" overbore allowed) Top Ring: 1.5mm, must be one piece design Middle Ring: 1.5mm, must be one piece design Bottom Oil Rings:3.0 mm, three-piece design consisting of two rails and one expander. Minimum distance from top of piston to first ring: .250" based on a .040 head gasket thickness.

45.5.7 **Cylinder Heads:** Only OEM Aluminum Heads supplied by GM for the LM7 motor -1999 thru 2007 may be used. Casting Numbers: 862, 706. Combustion Chamber Volume: 61 cc Intake Port Shape: Cathedral Intake Runner Volume: 200cc Exhaust port Shape: Oval Exhaust Runner Volume: 70cc. Cylinder head: Must remain unaltered in any way except the following: only flat milling is allowed, and intake and exhaust valve seats may be reworked (valve job) but touching and/or altering the aluminum part of the bowl is prohibited.

45.5.8 **Head Gasket**: Any stock or equivalent, stock replacement head gasket may be used.

45.5.9 **Valves**: Must not be made of titanium or “exotic” materials. Intake Valve Head Diameter: 1.890 in. Stem dia. 0.313 “x 4.880” Exhaust Valve Head Diameter: 1.550 in. Stem dia. 0.313” x 4.920” Valve Angle: Single 15 Degrees, Seat angle must be 45 degrees. Swirl polish allowed. Valve stem must remain the same size all the way. No back- cut allowed.

45.5.10 **Valve Train**:

45.5.10.1 Rocker Arm Style: Diecast/Roller Fulcrum – Stock as furnished by GM. Rocker Arm Ratio: 1:7

45.5.10.2 Valve Spring Style: BeeHive – Stock. Any stock or stock replacement valve springs, retainers, and keepers of OEM style may be used. No titanium or “exotic” materials allowed.

45.5.10.3 Lifters: Only OEM Hydraulic Roller lifters or equivalent replacements allowed. Link Style: Plastic Lifter Tray Lifter Body Diameter: 0.842 in. Push Rod Length: 7.385 in.

45.5.11 **Intake Manifold**: Must be Stock GM LS 1997– 2005 OEM # 25321788 molded plastic manifold: No alterations allowed to the intake runners, Fuel Injector holders, throttle body mount and sensors. No alterations allowed except the following: Exterior fins and gromets may be removed, vacuum ports may be plugged.

45.5.12 **Throttle Body**: 78 mm maximum size allowed. OEM AC Delco, cable or drive-by-wire system. 78mm aftermarket replacement allowed. No porting or polishing allowed. Vacuum ports may be used as reference for fuel pressure regulator. Unused vacuum port ports may be plugged. Any aftermarket intake tube and/or air filter may be used in combination with the factory Mass Air Flow sensor. The inside diameter of the throttle body at opening must be 78mm.

45.5.13 **Throttle Control**

45.5.13.1 1999 thru 2002 OEM throttle bodies – Cable Operated

45.5.13.2 2003 thru 2007 OEM throttle Bodies – Drive by Wire. The use of Throttle Actuated Control.

45.5.13.3 Modules: (TAC) and corresponding electronic throttle pedal and PCM is permitted. This system may be used as a standalone system or connected by means of a traditional throttle cable to actuate the electronic throttle pedal. This must be a matched system.

45.5.14 **Exhaust System**: Any exhaust system/headers may be used.

45.5.14.1 O2 Sensors may be mounted at any location and are not limited in quantity.

45.5.15 **Fuel System**

45.5.15.1 Fuel Injectors: GM part Number 12576341 (42lb) Fuel injectors must be 12 OHM resistance and have a flow rate of 756.0cc/min at 50-60 psi. (58psi recommended) Any OEM LS fuel injector may be used. Aftermarket Injectors are prohibited. Fuel Rail Bore 0.540 Intake Bore 0.540 no alterations allowed. Fuel Injectors must be one of the following OEM LS #: 17113698, 12533952, 12554271, 12555894, 12556154, 12482704, 12561462, 12576341, 12598646, 12613411, 12569113, 12580681, 12613412, 12609749, 12639221, 12613411. Adaptors may be used to fit different sized injectors into the stock manifold port. (LS injectors vary in length and diameter)

45.5.15.2 Fuel Rails: OEM Fuel rails or direct OEM replacement intended to operate at 50-60 psi are allowed.

45.5.15.3 Fuel Pumps: Any electronic fuel pump is allowed. Surge tanks, multiple fuel pumps and in-tank submerged fuel pumps are allowed.

45.5.15.4 Fuel Pressure Regulator: A fuel pressure regulator must be used. Fuel pressure must be between 50 psi – 60 psi. (58 psi recommended) Any fuel pressure regulator may be used in place of the OEM return line system.

45.5.15.5 Fuel Lines: Fuel lines must be mounted in a position to reduce damage. No fuel lines shall pass through the driver's compartment. No plastic fuel filters. No plastic pressure lines. Great care must be used in fuel line connections, junctions and bends.

45.5.16 **Camshaft:** Comp Cams 54-777-11-NSR Drifter- Grind #: 294LSD14, Duration at .050 (Int/Exh.): 294/304, Lift (Int./Ex.): 0.541in, /0.541 in., Lobe Separation Angle (In degrees): 114, Cam gear attachment: 3 bolt, Camshaft sprockets, crankshaft sprockets and chain may be any "chain type." No belt or gear drives. *NOTE: This camshaft requires no aftermarket valve springs.

45.5.17 **Oil System:** Oil pan, pickup, and filter system may be altered to fit boat and incorporate baffles, windage tray and/or crankshaft wipers. Oil pan must remain a wet sump system. 'Aeroquip' type oil lines only for remote oil filters. Aftermarket Oil Pump for increased volume or pressure allowed.

45.5.18 **Electrical System**: Engine to be controlled and run with any powertrain control module referred to as a PCM or ECU. Aftermarket PMS/ECUs are permitted and recommended for racing applications.

45.5.18.1 PCM/ECU: Haltech Rebel LS PCM/ECU Engine control system NOTE: "Tuning" of aftermarket PCM/ECU includes a wide array of adjustments such as ignition timing, fuel mixtures, injector timing, RPM limits, throttle position, idol speed. This list is not comprehensive. The intent of an aftermarket PCM/ECU system is not to give an advantage but to allow proper engine management to achieve optimal engine performance in racing conditions. A PCM/ECU is similar in comparison to ignition timing and carburetor jetting adjustments. The limiting factor for engine performance shall continue to be the intake of air to the engine through the throttle body, intake manifold, and camshaft. Adjustments to the "tune" (any of the parameters) of a PCM/ECU during a race shall not be permitted.

45.5.18.2 (OEM PCM/ECU OPTION) MFG: Delphi 1-mb Gen III - General Motors released several different hardware numbers to identify the 1-mb Gen III PCMs, but any of them can be used with an engine equipped with a 24x crank signal. PCM #'s: *09354896, *12200411 were used from 1997 – 2004 and have connectors with blue and red retainers. PCM #'s: *12589462,12589463, *12602801,12602802, 28042802 were used from 2005 – 2007 and have connectors with blue and green retainers. PCM with (*) will accept throttle cable throttle linkage all others require a TAC or drive by wire application. Wiring harness may be modified, or custom made to use any fuse/relay system to power the engine. Unused circuits into or out of the PCM may have the wire/pins removed but remaining pins must be in the factory locations; in other words, the pinout locations must remain as from the factory. Any sensor may be removed or disconnected but shall not be modified or altered to perform or record values in any other way other than OEM intended methods with the following exceptions: Downstream O2 sensors may be removed or may be "tricked" to report exhaust gases as if a catalytic converter were present. Output shaft speed sensor (transmission) may be mounted in such a way as to report a theoretical speed to the PCM thereby "tricking" the PCM into allowing the fuel injectors to actuate. The Output speed sensor may also be deleted as necessary and PCM programed to function without its input.

45.5.19 **Recommended Minimum Inspection Procedure for GM LM7 5.3L motor**

45.5.19.1 Check combustion chamber: Cylinder head chamber volume 42.0cc minimum. Flat portion of piston must be below gasket (installed on head) a minimum of 0.040". Compressed head gasket thickness must be a minimum of 0.022".

45.5.19.2 Check maximum cylinder bore allowance: (3.780" OEM), Maximum Bore: 3.810 in. This allows the use of .020" oversized pistons.

45.5.19.3 Check Rod length/engine stroke: Stroke: 3.622 in max, Rod Length: 6.1 in

45.5.19.4 Check piston ring height: Minimum distance from the top of the piston to the first ring: .250"

45.5.19.5 Check valve train: Valve sizes and face angle. Single 15 Degrees – no back cut allowed Intake Valve Head Diameter: 1.890 in. Stem dia.: 0.313 "x 4.880" Exhaust Valve Head Diameter: 1.550 in. Stem dia.: 0.313" x 4.920" Valve Angle: Single 15 Degrees – no back cut allowed

45.5.19.6 Check the camshaft. Tools required: One 6" or 8" degree wheel attached to the end of the crankshaft; one 500 thousandths travel dial indicator and a wire pointer. Lobe Separation Angle (In degrees): 114 Duration at 0.050 (Int/Exh.): 294/304: Using a Dial Indicator and Degree Wheel, find the opening and closing points of the valves at 0.050 in. of lift. If the intake valve opens AFTER TDC, use a negative value. If the exhaust valve closes BEFORE TDC, use a negative value. Add the numbers together. Add 180° to find duration. Lift (Int./Ex.): 0.541in, /0.541 in. Procedure: Rotate engine in normal direction until the lifter is on the heel of the camshaft lobe. Set dial indicator on valve spring retainer. Rotate engine in normal direction until indicator reads .050 stop. Set degree wheel to zero degrees or TDC mark on degree wheel. Rotate engine in normal direction and check every .050 thousandths lift. Read degrees on degree wheel. Check all parts for any grinding, polishing and any other alterations from the furnished stock configuration. durability and power.

**RULE 48 - GRAND PRIX HYDROPLANE CLASS**

**Add below and renumber remaining GP rules**

**48.1** The Grand Prix class must follow all Inboard rules listed this rulebook, however, should the GP class members decide to participate in the GPA Series, the following rules will apply:

**48.1.1** There will be no title event awarded (Eastern, Western, Summer National) for any GPA Series race.

**48.1.2** No points will be earned at any other non-GPA Series event

**48.1.3** This proposal will remain in effect for a period of five years (1/24/25-1/24/30) and will only be effective if there is a minimum of four (4) events. NO CHANGES TO THESE RULES ARE ALLOWED DURING THIS TIME PERIOD.

**48.2** STARTING PROCEDURE**:**

**48.2.1** QUALIFICATIONS AND TIME TRIALS

**48.2.1.1** For time trials there will be a random draw to determine the order. For time trials, the Race Director will decide how many laps are to be done. Every lap will be timed but only the fastest lap time of the allotted laps will be considered as the official time.

**48.2.1.2** Before the start of the race, boats must take their assigned lanes at the mid-course buoy on the back stretch and maintain their lane until the exit of turn one (1). If a boat is not in his lane due to a race incident on the course, it shall not be penalized if they do not take advantage of the situation.

**48.2.1.3** In the first 2 qualification heats, the lane draws are determined by time trial position. For the third qualifier, the lanes will be determined by total points accumulated for the weekend. The boats with the lowest point total will be awarded the inside lane (Highest point total will be awarded the outside lane). The tie breaker will be the fastest time trial time. (See chart below)

**48.2.1.4** A qualification shall be considered official provided that all the heats of the same qualification group have run.

**48.2.1.5** The number of boats per heat is determined by the Race Director/ Chief Referee depending on the racecourse.

**48.2.2** FINAL AND CONSOLATION

**48.2.2.1** Boats starting in the second row (trailer) must start five (5) seconds after the official clock hits the 0:00 and must remain in their earned lane(s) throughout the first corner.

**48.2.2.2** If a boat qualifies for the final based on total points and declares a DNS prior the launching, the field will be completed according to the result of the position of the consolation. Only the boats that made the consolation will be used to complete the group for the final. The choice of the boat(s) will be according to rule 48.2.2.4. If there is no consolation for a class, the group for the final will be completed according to the rule

**48.2.2.3** However, in the case of a restart in the final where two (2) or more boats cannot make the restart, the Race Director and Chief Referee reserve the right to fill the field, and these boats will take the start on the outside lanes. Position for the final and consolation will be determined by the total accumulation of points from the qualifications and/or time trials. If there is a tie in total points, the best time of the qualifications will determine the standing. (If there is still a tie, a random draw will determine its standing. In the absence of time for a qualification for one or more groups, the time of this wave cannot be used to decide a tie.)

**48.2.2.4** The number of boats in a final will be decided by the race director/ chief referee. The boats with the highest total of points per the weekend will go directly to the final. The winner of the consolation will qualify for the final in the outside lane. If there are 2 consolation heats, the 2 winners will qualify for the outer 2 lanes based on the consolation final time.

**48.2.2.5** There will be only one final per class per event. The race director and the chief referee can decide to hold a final without having a consolation. The consolation will only be considered official if the final is declared official.

**48.2.2.6** If no official time trial/ qualification is held during the weekend, there will be no final.

**48.2.2.7** If a final cannot be presented, the final standings for the weekend will be determined by the number of points accumulated during the qualifications and/or the time trials. If there is a tie in the accumulation of points, the best time of the qualifications will determine the standings/winner. If the tiebreaker cannot be broken by fastest time trial time, the standings will remain as they are and there will be more than one boat in the same position.

**48.2.3** Lane Assignment

## Lane Assignement

### 2 Groups

| Cr | Q1 1A | Q1 1B | Q2 2A | Q2 2B | Q3 3A | Q3 3B | Q4 4A | Q4 4B |
|---|---|---|---|---|---|---|---|---|
| 1 | 1 | 2 | 16 | 15 | 15 | 16 | 16 | 15 |
| 2 | 3 | 4 | 13 | 14 | 13 | 14 | 13 | 14 |
| 3 | 5 | 6 | 12 | 11 | 11 | 12 | 12 | 11 |
| 4 | 7 | 8 | 9 | 10 | 9 | 10 | 9 | 10 |
| 5 | 9 | 10 | 8 | 7 | 7 | 8 | 8 | 7 |
| 6 | 11 | 12 | 5 | 6 | 5 | 6 | 5 | 6 |
| 7 | 13 | 14 | 4 | 3 | 3 | 4 | 4 | 3 |
| 8 | 15 | 16 | 1 | 2 | 1 | 2 | 1 | 2 |

### 3 Groups

| Cr | Q1 1A | Q1 1B | Q1 1C | Q2 2A | Q2 2B | Q2 2C | Q3 3A | Q3 3B | Q3 3C | Q4 4A | Q4 4B | Q4 4C |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1 | 2 | 3 | 23 | 24 | 22 | 22 | 23 | 24 | 23 | 24 | 22 |
| 2 | 4 | 5 | 6 | 19 | 20 | 21 | 19 | 20 | 21 | 19 | 20 | 21 |
| 3 | 7 | 8 | 9 | 18 | 16 | 17 | 16 | 17 | 18 | 18 | 16 | 17 |
| 4 | 10 | 11 | 12 | 14 | 15 | 13 | 13 | 14 | 15 | 14 | 15 | 13 |
| 5 | 13 | 14 | 15 | 10 | 11 | 12 | 10 | 11 | 12 | 10 | 11 | 12 |
| 6 | 16 | 17 | 18 | 9 | 7 | 8 | 7 | 8 | 9 | 9 | 7 | 8 |
| 7 | 19 | 20 | 21 | 5 | 6 | 4 | 4 | 5 | 6 | 5 | 6 | 4 |
| 8 | 22 | 23 | 24 | 1 | 2 | 3 | 1 | 2 | 3 | 1 | 2 | 3 |

### 4 Groups

| Cr | Q1 1A | Q1 1B | Q1 1C | Q1 1D | Q2 2A | Q2 2B | Q2 2C | Q2 2D | Q3 3A | Q3 3B | Q3 3C | Q3 3D | Q4 4A | Q4 4B | Q4 4C | Q4 4D |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1 | 2 | 3 | 4 | 32 | 29 | 30 | 31 | 29 | 30 | 31 | 32 | 32 | 29 | 30 | 31 |
| 2 | 5 | 6 | 7 | 8 | 27 | 28 | 25 | 26 | 25 | 26 | 27 | 28 | 27 | 28 | 25 | 26 |
| 3 | 9 | 10 | 11 | 12 | 22 | 23 | 24 | 21 | 21 | 22 | 23 | 24 | 22 | 23 | 24 | 21 |
| 4 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 17 | 18 | 19 | 20 | 17 | 18 | 19 | 20 |
| 5 | 17 | 18 | 19 | 20 | 16 | 13 | 14 | 15 | 13 | 14 | 15 | 16 | 16 | 13 | 14 | 15 |
| 6 | 21 | 22 | 23 | 24 | 11 | 12 | 9 | 10 | 9 | 10 | 11 | 12 | 11 | 12 | 9 | 10 |
| 7 | 25 | 26 | 27 | 28 | 6 | 7 | 8 | 5 | 5 | 6 | 7 | 8 | 6 | 7 | 8 | 5 |
| 8 | 29 | 30 | 31 | 32 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |

**48.2.4** Point distribution chart:

| Positions | Essais Chronométrés Time Trials *** | Qualifications | Consolations | Finale/ Final A | Finale/ Final B |
|---|---|---|---|---|---|
| *1* | 25 | 25 | Accès à la finale | 25 | 7 |
| *2* | 25 | 21 | 7 | 21 | 6 |
| *3* | 21 | 18 | 6 | 18 | 5 |
| *4* | 21 | 15 | 5 | 15 | 4 |
| *5* | 18 | 13 | 4 | 13 | 3 |
| *6* | 18 | 11 | 3 | 11 | 2 |
| *7* | 15 | 9 | 2 | 9 | 1 |
| *8* | 15 | 8 | 1 | 8 | 1 |
| *DNS/DNF/DNQ* | 0 | 0 | 0 | 0 | 0 |

o DNS : Did not start.
o DNF : Did not finished.
o DNQ : Did not qualify or Disqualified

**48.2.5** High point champion will be determine using the above points system.

**Remove existing rule 43.2 and replace with the following:**

**43.2 Approved engines**

43.2.1 Ford Pinto 2000cc O.H.C., the Ford 2.3 Litre, SOHC, the Ford “Focus” 2.0 Litre DOHC Duratec, and Honda K20a DOHC. Parts must be used as furnished by the vehicle manufacturers. Alterations are not permitted except as specified herein.

43.2.2 Engines used in the 2.5 Litre Stock class must be a reciprocating piston type.

43.2.3 If other parts from other manufacturers are to be allowed, they will only be those listed in these specifications.

43.2.5 1.9 SEFI GEN II SOHC Ford engine of the 1.5 Liter Stock class. See Rule 42.

**Insert new rule set for the Honda engine**

**43.11 Honda K20A Engine Specifications**

43.11.1 Must be a stock production-style Honda engine, specifically ACURA RSX (2002-2006) or HONDA CIVIC SIR (2002-2006) with a plastic intake. Permitted models: K20A3 USDM North America (2002-2006), 160 hp, 1996cc, or K20A Japan market 160 hp (excluding K20A2 type R). When using Honda Civic SI USA (SIR for Canada) 2002-06, intake manifold needs to be replaced for the plastic intake manifold. (SEE article 43.18.1).

43.11.2 Identification numbers must remain intact.

**43.12 Gearbox**

43.12. 1 Honda engine option only; multi-speed or adjustable gearboxes are prohibited.

43.12.2 Clutch or belt drive systems are not allowed.

43.12.3 Maximum of 2 gears; gears must be 6-splines, 1 inch wide, and purchased over the counter. Gears cannot be modified in any way, no custom gears allowed.

43.12.4 No conical or exotic gear is allowed.

**43.13 Crankshaft**

43.13.1 OEM crankshaft, part number 13310-PNA-000. Knife edging not allowed.

43.13.2 Bore and stroke: 86.62mm (3.41") max bore and 85mm (3.346) max stroke.

43.13.3 OEM steel flywheel, part number 22100-PND-003 or Luk LFW407 and a minimum weight of 14 pounds (6.35 kilos), with no additional holes.

**43.14 Connecting Rods**

43.14.1 OEM steel connecting rods only, part number 13210-pnc-000.

43.14.2 Aftermarket connecting rods not allowed.

43.14.3 Center line 5.437" +/- .010" (138.1mm).

43.14.4 Weight: 476 grams +/- 5 grams (16.79 ounce +/- .18 ounces).

43.14.5 OEM connecting rod bolt, part number 13204-P8A-A01.

**43.15 Pistons**

43.15.1 Spec Wiseco piston, part number K631M865 86.5mm (3.405 inch) is oversized (+0.020). OEM stock piston is also allowed.

43.15.2 Deck height max is .127mm (.005 inch) above the block.

**43.16 Camshaft and Valve Train**

43.16.1 OEM camshaft, part numbers 14110-PPA-010 and 14120-PPA-010, with specified intake and exhaust duration and lift. Intake max lift: 0.372" (9.45mm) and Exhaust max lift: .383" (9.73mm).

43.16.2 Honda K20A cam profile procedure:
Install a degree wheel on the exhaust cam gear. Remove valve lash from intake and exhaust rockers arms being checked. Set up dial indicator on valve retainer in line with valve travel. Rotate crankshaft in clockwise rotation until .050 valve lift is achieved and set pointer to TDC on degree wheel. Rotate crankshaft to take degree readings at the following indicator readings. Repeat procedure for intake cam.

| Intake | | Exhaust | |
|---|---|---|---|
| Lift in (inches) | Degrees | Lift in (inches) | Degrees |
| @ .050 | TDC | @ .050 | TDC |
| @.100 | 7 | @ .100 | 6 |
| @ 150 | 12 | @ .150 | 11 |
| @ .200 | 17 | @ .200 | 16 |
| @ .250 | 23 | @.250 | 22 |
| @ .300 | 31 | @ .300 | 29 |
| @ .350 | 43 | @ .350 | 39 |
| @ .372 | MAX LIFT | @ .383 | MAX LIFT |

| | | | |
|---|---|---|---|
| @ .350 | 62 | @ .350 | 62 |
| @ .300 | 75 | @ .300 | 72 |
| @ .250 | 82 | @ .250 | 78 |
| @ .200 | 88 | @ .200 | 84 |
| @ .150 | 94 | @ .150 | 89 |
| @ .100 | 100 | @ .100 | 94 |
| @ .050 | 106 | @ .050 | 100 |

The smaller secondary intake lobe lift is .074” (1.87mm) max and not able to profile.

43.16.3 Valve angles: OEM and factory valve angles only. Ferrea intake and exhaust parts must remain unmodified. FERREA valve permitted - intake F5510 - exhaust F1546P.

43.16.4 Ferrea intake valve F5510- Head Diameter: 35 mm (1.377”), Stem Diameter: 5.47 mm (.215”), Overall Length: 109.3 mm (4.303”), Tip Length: 2.5 mm (.098”).

43.16.5 Ferrea exhaust valve F1546P- Head Diameter: 34 mm (1.338”), Stem Diameter: 5.47 mm (.215”), Overall Length: 102.35 mm (4.029”), Tip Length: 2.5 mm (.098”).

**43.17 Cylinder Head**

43.17.1 OEM cylinder head, part number 12100-PNC-010, must remain unaltered. (PNC -___ casting number on head)

43.17.2 Head surfacing allowed combustion chamber volume 49cc minimum.

43.17.3 Head gasket minimum compressed thickness .025” (.635 mm).

43.17.4 No changes are permitted in the valve area.

43.17.5 Must use Supertech valve springs and retainers, part number SPRK-M1007S-K2 (tested at 74 pounds and must be less than 39.8 mm (1.566”).

43.17.6 No cutting of spring seats or shims permitted.

**43.18 Intake Manifold**

43.18.1 Must be OEM plastic only, part numbers 17100-PNC-J0 or 17100-PPA-A01.

43.18.2 Milling or polishing is not allowed.

**43.19 Throttle Body**

43.19.1 OEM throttle body, part number 06160-PND-A62.

43.19.2 Grinding or polishing of the air inlet port is not allowed.

43.19.3 The throttle body bore inner diameter at mounting surface 3.350” +/- .010” Max (85.09mm +/- .254mm).

43.19.4 Only original components of the throttle body from the manufacturer may be used.

**43.20 Ignition**

43.20.1 Ignition coil part numbers: OEM 30520-RRA-007, Denso 673-2301, Hitachi IGC4030, and Hitachi IGC4030D.

**43.21 Fuel Delivery**

43.21.1 Injectors permitted: Honda 16450-PPA-A01 or OEM equivalent, recommended part number is Hitachi FIJ0061. The ECU is configured with the locked tune file specifically calibrated for these injectors. Use of non-compliant injectors may lead to suboptimal performance or failure.

43.21.2 Fuel Pressure must be between 48-52 PSI - Any pump can be used. Pressure monitored through ECU and a mandatory fuel pressure sensor.

**43.22 Oil System**

43.22.1 Must use stock steel oil pan; modification for oil sump permitted.

43.22.2 OEM oil pump only, part number 15100-PRB-A01.

43.22.3 Wet sump is required.

**43.23 ECU (Engine Control Unit)**

43.23.1 G4X MonsoonX ECU, part number 127-4000

43.23.2 The computer (ECU Link G4X MonsoonX) must be installed behind the cockpit in the engine compartment.

43.23.3 Unique APBA ECU Tune file mandatory – Contact Inboard Chairman for ECU programming instructions. ECU may be reprogrammed at race site by the inspector.
An 8 inch ‘Precision Auto’ sticker must be affixed to the exterior of the boat.

43.22.4 ECU serial number must be provided to APBA though IRC administrator.

43.23.5 Fuel pressure sensor connected to your supplied Link 0-100 psi ECU is mandatory. AEM PN: 30-2130-100

43.23.6 Oxygen sensor and Link CAN Lambda: Bosch oxygen sensor, part number 17025 (Bosch LSU4.9), connected to the Link CAN Lambda, part number 125-1000, is mandatory.

43.23.7 All the following motor sensor data is mandatory and must be working properly, data log files may be required by inspector after any heat.

- IAT : Intake Air Temp
- ECT : Engine coolant Temp
- TPS : Throttle Position Sensor
- MAP : Manifold Absolute Pressure
- Fuel Pressure HRL sensor kit PN: HRL_FP
- Lambda1: Lambda reading air/gas mixture (Link Lambda sensor)

43.23.8 Properly means it's installed and used in the manner it was intended for.

**43.24 Headers**

43.24.1 Only Schoenfeld headers, part number F9284V3M-HP and F9284V3M-HP, -NP (no paint), are allowed; The extension at the end of the collector shall not exceed 28” inches in length and 3 inches in outside diameter, no modification is allowed.

43.24.2 May install weld-on fittings for sensors such as mandatory o2 sensor at the end of the collector prior to the extension.

**Flatbottom rule changes**

**RULE 54 - SPORTSMAN ENTRY (SE) CLASS**

SE (Sportsman Entry) is an entry level class intended to promote a fun, affordable class with a maximum speed of 90.0 mph using only GM or Ford **or aftermarket equivalent** cast iron small block and cast-iron heads derived from passenger or truck model vehicles sold in North America (on road vehicles only) and abiding by inboard runabout and safety rules including rule 3.5.3.

**54.1.2** Maximum speed of 90.0 mph without tolerances. ~~A violation of the 90-mph limit will result in a disqualification from that heat~~**. A boat that exceeds the 90.0 MPH limit by up to 1 MPH (90.1-91.0 MPH) will receive a 1-minute penalty, a boat that exceeds 91.1 MPH will be disqualified for the heat.**

**54.1.4** Because this is a speed limited class, there shall be no ~~competition or~~ kilo records kept.

**54.3.7 Cylinder Heads.**

**54.3.7.1** ~~Only stock GM or Ford cylinder heads with in-line valves may be used.~~

**54.3.7.1 Stock or aftermarket equivalent cast iron cylinder head with inline valves at no less than a 23-degree angle for Chevrolet or 20-degree angle for Ford (valve angles) may be used.**

**55.1.6** Because of the maximum speed, no **~~competition or~~** straightaway records will be attempted.

**55.4.1** If it is found that a boat has exceeded the 105 MPH limit, **~~the boat will~~** ~~receive a disqualification~~**. by 1 MPH (105.1-106.0 MPH) the boat will receive a 1-minute penalty, a boat that exceeds 106.1 MPH will be disqualified for the heat.**

**55.5 Engine**

**55.5.1 Engines must be normally aspirated, no superchargers or turbochargers, no forced induction of any type, and no nitrous injection of any type.**

**Passed by the APBA Safety Committee**

3.5.4 No image recording devices may be attached to helmets for unrestrained drivers. Restrained drivers may use a device that weighs less than 60 grams. Not to be attached to top of helmet. Must be attached to the visor, chin or inside helmet. No holes are permitted to be drilled in the helmet shell for camera attachment.

**40.12** A gearbox ~~and/or belt drive system~~ may be used as an engine-shaft coupler in the **2.5 Stock,** 2.5 ~~Litre~~ Mod, 1-Litre, National Mod ~~and~~ GNH, GP, SE, SA**, PS** and ~~SS~~ **KRR**.