



ANNEX A

HRL - GP Technical Rules

- A.** Class letter designation shall be “GP”
- B.** 1- New construction:
This class shall be for hydroplanes only. Minimum length shall be 24' 0" excluding projections not integral parts of hull structure.
Box rule: Maximum length shall be 26' 0" including projections not integral parts of hull structure. Maximum width shall be 12', 6". No maximum for tunnel.
- 2- Hulls:
To be eligible to race you must submit the Hull and Motor Specs to Regates de Valleyfield HRL-GP.
- 3- Color schemes and numbers:
For safety reasons it is important to submit your color scheme to HRL - GP for approval. Dark colors are not acceptable unless offset by more visible colors.
For example: Navy blue decks with bright yellow cowlings.
Numbers are to be a minimum 15" high and on both sponsons.
- C.** Propulsion will be by one underwater propeller. Outdrives are not allowed. Said propeller shall have no more than three blades.
1-No forged propellers shall be allowed. HRL-GP reserves the right to purchase your propeller for \$ 3,000 for inspection purposes.
- D.** While the most important safety rules are outlined here, **all APBA Inboard safety rules apply to this class unless otherwise specified.**
1- For safety you must have a check valve on your water inlet to prevent water from running out.
- E.** All current inspection procedures outlined here and in the APBA Inboard racing rules apply. Only HRL-GP inspectors are authorized to inspect HRL-GP boats.
- F.** Two-way radio communications are **mandatory.** Frequency checks shall be reviewed at the drivers' meeting to determine conflicting or overlapping channels between boat camps.
- G.** All entries must have cockpit construction which complies with inboard racing rules section B., type 4 restraint capsule.
1- For safety, canopy must be painted orange inside.



2- Air: An air system is mandatory. All air delivery systems whether permanent or part time shall carry air in a vessel approved and certified for the delivery of breathing air. Said vessel must meet D.O.T. (Department of Transportation) standards of T.C. (Transportation Canada) standards for such devices. The vessel must also be stamped showing it has been inspected and certified to meet the above D.O.T. and T.C. standards.

- H. Strobe lights are mandatory and a fine will be imposed if a competing boat does not have one.
- I. All boats must have an on-board 9 pound minimum manual or automated Fireboy (or approved equal) fire extinguisher securely mounted outside the cockpit area. A minimum of two spray nozzles will be installed in the engine compartment. The activation of the fire system will be either automatic and /or manual with a handle located on the outside Starboard side of the fixed cockpit cowling. The handle will be marked with a red triangle and the word Fire.
- J. **Please note that this rule is slightly different from the APBA rule.**

1-New constructions:

All rudders must be made of 17-4 with a minimum heat treatment of 38 Rockwell and a maximum of 48 Rc (Rockwell C scale) or equivalent strength. For 4130 and 4140 steels, quench and temper to a hardness of 325 HB (Brinell Hardness) The use of material of equivalent strength is also permitted. It is the responsibility of the builder to obtain certification from the supplier.

2-New constructions:

The pin must be made of 17-4 H900 or higher (the H number). The rudder brackets and quadrants must be made of either 6061 T6 aluminum or 7075 aluminum (7075 is stronger) Materials of equal strength may be used. It is the responsibility of the builder to obtain certification from the supplier.

3-Skid fins are required to be minimum $\frac{3}{4}$ " aluminium # 7075 or heat treated 4140 or 4130 steel. Steel skid fins should be quenched and tempered to a hardness of 325 HB (Brinell Hardness) Brackets as a minimum must be made from # 6061 aluminium, # 7075 is better. Stainless steel # 17-4 and steel # 4130 may also be used. The maximum square inches of a skid fin area below the water surface shall be 272Sq". The measure will be taken by a straight edge from the bottom of the sponson to the skid fin. The measurements will be taken below that. Only continuous leading edges on a skid fin are permitted. Jagged edges are not allowed.

- K. Gear boxes are allowed but multiple speed gear boxes are not permitted.
- L. Minimum hull weight boat only after a race is 2,850 lbs. without the driver and completely drained of water. During the weighing process no one is allowed to touch the boat.



M. Engine:

If it is not written here inform yourself.

1-Total cubic inches shall be 468.

2-Block: Any manufacturer cast iron Block only, short deck 9.800” or Tall deck 10.200”. Maximum bore of 4.310 inch. Tolerance + or – 0.005 Crankshaft stroke must be 4.00”. Tolerance + or – 0.005 cylinder and lifter bore may be sleeved to meet stock spec. if damaged.

3-Head:

a- Purchase **MUST** be done through the Hydroplane Racing League – HRL, Coordinator 450-371-6144 ext.: 224 – Anne-Marie Leboeuf.

No alterations permitted except for the addition of Jesel shaft mount rocker systems or similar systems. Only milling the intake rocker studs is permitted for fitting the Jesel system and will be done by Dart, please notify HRL-GP when ordering heads if you want to use this system. Heads must have the official HRL stamp on at all times. The letters <MRV 2007> will be the official stamp of the GP class.

b- DART 355 pro only. CNC production purchased from HRL. Heads will be bare and have the Regates de Valleyfield logo stamped on them. The stamp **MUST** be visible at all time. Repairs to the head are permitted but they have to be certified and have the new spec sheet from the manufacturer. **No angle milling.** The spec sheet must be presented to the HRL-GP representative in person at registration of the following race. **Combustion chamber = 119cc + or – 2cc.**

c- Valve Springs: Any type and any manufacturer may be used. No titanium or exotic material.

d- Valves-Any manufacturer may be used, no titanium or exotic material. **This specific spec. must be respected. Our reference is Manley, part number 11843-8 (exh.), 11854- 8 (int).**

Type	Head Diameter	Steam Diameter	Installed Height	O/A Length	Tip Length	Underhead Angel/Radius	Margin	Seat Width	Top of Head	Wgt/ Grams
exh	1.880	.3415	stock	5.422	.250	10°x 3/8”	.075	.100	6° dish	122
int	2.300	.3415	.250 longer	5.494	.250	12°x 3/8”	.050	.080	7° dish	148

4-Limit cam lift at the valve stem to .680” Method to be used to verify cam lift: **To verify first adjust the rocker so that there is 0 lash then rotate cam until you get max lift.**

5-Crankshaft: not to exceed 4 in stroke. Tolerance + or – 0.005



6-Connecting rods: steel rod, any type or manufacture. Length 6.135 for a 9.800 deck block and 6.535 for a 10.200 deck block. No Aluminum or titanium or exotic material and no handmade rods.

7-Lifter, any manufacture, no hydraulic lifter, no mushroom lifters. Alterations to the lifter are not allowed. Bronze lifter bushings are permitted, keyed lifters and/or bushings are prohibited.

Lifters not to exceed standard GM diameter of .842''

8-Rocker, roller rocker may be use, not to exceed 0.680 lift.

9-Piston: Any type or manufacturer. No more than 20cc piston dome. The block may be decked (.010'' maximum) (a minimum of 9.790'' for a short deck and 10.190'' for a tall deck) top of the piston (flat surface) at TDC must have a minimum distance of .060'' with gasket. Any piston ring may be used, thickness is 1/16 - 1/16 - 3/16. Thickness of the rings must be uniform in each case.

Method of inspection: Rotate motor to TDC (Top Dead Center) place plastic fluid retainer over piston and seal. With the use of a calibrated burette introduce a liquid into chamber and record the amount of liquid used. The measuring process is accomplished by actually filling the combustion chamber with fluid from a graduated burette. A flat Plexiglas plate is placed over a combustion chamber and fluid is released into the chamber through a hole in the Plexiglas plate. A thin layer of grease seals the plate against leaks to either the cylinder head or cylinder block. When the combustion chamber is completely filled with no air bubbles showing, read the burette and write down the number.

The easiest way to measure piston dome or dish volume is to cc the piston in the cylinder. Seal the rings with grease, accurately place the piston 0.100 inch down in the cylinder and then measure the cc volume by filling up the cylinder. Next, compute the volume of a standard cylinder (bore x bore x height x 0.7854). For example, a 4.00-inch bore and a 0.100-inch height would be: $4 \times 4 \times 0.100 \times 0.7854 = 1.256 \text{ ci} \times 16.387 = 20.59 \text{ cc}$. If you are measuring a piston with a dome, the measured volume will be less than the computed volume with the difference being the effective dome volume.

10-Oil pan: any oil pan may be used.

11-Dry sump: any dry sump may be used.

12-Push rod: any push rod may be used. No titanium, exotic material or handmade rods may be used.

13-Valve spring retainer may be titanium or steel, no exotic material.

14-Timing chain, gear drive may be used.



15-Intake manifold: Any manufacturer cast aluminum may be used. No handmade fabricated manifold. Two piece manifolds which consist of a cast base and an adaptor plate may be used as long as the adaptor plate is less than one inch thick. The adaptor plate may be constructed of cast or extruded aluminum. No magnesium or exotic material. No handmade fabricated manifolds.

16-No titanium engine components with the following exceptions: Valve spring retainers.

17. Maximum compression ratio 9, 5:1 static

18. Supercharger must be an 8-71 standard roots type design with 60 degree helix rotor only.

- a. Case and rotor must be a maximum 16.00'' in length inside diameter.
- b. Cast or billet rotors are allowed, 5.860'' maximum rotor diameter.
- c. Supercharger to be driven at no more than 20% (120%) of crankshaft speed
- d. No magnesium cases or rotors.
- e. **Nothing** is permitted between the base of the supercharger and the intake manifold.
EX.: Spacer Plate, Intercooler or After cooler, Chiller, etc.,
- f. Any supercharger inlet opening and /or outlet opening 'shape or dimension' is allowed without exposing the ends of the rotors.

19. No overhead camshafts.

20. Maximum of 2 valves per cylinder.

21. Fuel and air must be metered by a mechanical fuel injection system. No electronic fuel injection systems permitted. All fuel must be injected by hat nozzles using a cast aluminium injector available from a major manufacturer.

22. Fuel will be methanol only.

23. The use of a magneto is permitted and it must be placed in its original position behind the supercharger on the intake. No offsets are permitted. The use of two (2) MSD boxes is permitted.

The following ignition system will also be permitted.



Electromotive XDI system part number 016-50000 or
Electromotive XDI-2 system part number 016-60000.

*With either one of these systems you will need a reader part number 150-10000.

*The inspector must at all times be able to slip a magneto into the receptacle for the magneto. No offsets allowed.

For further information visit the electromotive website:

<http://www.electromotive-inc.com/products/directignition.php> or call and ask for Mr. Ewe Schuettler 703-331-0100 ext 217.

No other ignition systems are allowed.

N. On board computers: The use of on board computers is permitted as a data recovery system and not for making adjustments of any kind during the race.

If it is not written here you are not allowed to do it.



ANNEX B

HRL Engine Rules H-350

Any participant not being within the rules specifications will be penalized as per rule 11.1

ENGINE BLOCK

- A. Stock production style GM V8 engine V-8 only. No V-6 or 4 cylinders.
- B. Must be cast iron block with standard external measurements only.
- C. Maximum 358 cubic inches
- D. No removing of identification numbers. No grinding or lightening.
- E. A maximum of 3 sleeves in cylinders and 7 sleeves in lifter holes. (No index lifter holes)
- F. 153 teeth SFI type flywheel.
- G. Starter - Any starter that functions like the stock starter. No inertia starters.
- H. Only aftermarket engine block permitted: Dart SHP P/N: 31161111

CRANKS

- A. Minimum 50-lb. (including balancing) Steel magnetic cranks only.
- B. Stock stroke for block. 3.480". (+ or - 0.010")
- C. Unaltered except for normal cleanup and balancing.
- D. Cranks should not be contoured or sculptured.
- E. Stock main journal and rod journal sizes only. 2.4450"main/2.100"rod.
(Undercut maximum 0.030")
- F. No knife edge allowed

CONNECTING RODS

- A. Any large journal magnetic steel type connecting rods only.
- B. No titanium OR aluminum rods.
- C. 5.700" maximum length. (+ or - 0.010")
- D. Minimum weight of rods 600 grams (cap and bolt included)
- E. **MUST** use full floating pins

PISTONS

- A. Any piston may be used. Pistons must be in stock configuration. Piston skirt must be a full round. No FSR.
- B. No portion of the piston may protrude above the top of the block and that without any head gaskets.



- C. No gas porting of piston ring lands and no top of piston coating of any kind.
- D. The weight of each piston should not be less than 590 grams including the wrist pin and "C" clips and rings.
- E. Piston Rings - Must be of the type supplied by General Motors. The 1st and 2nd rings (compression) must be 1 piece design, 3rd ring (oil) must be 3 piece design, consisting of 2 rails and 1 expander. Moly file fit allowed. Minimum thickness of rings 1/16" for top and second, 3/16" for oil control ring.
- F. Ring lands must remain in standard location. Minimum distance between top of piston and top of first ring (compression) 0.180"
- G. No gapless rings allowed
- H. Maximum size over standard piston allowed (0.040")

CAMSHAFT & VALVETRAIN

The ONLY 2 camshaft accepted are:

Option 1: HRL Camshaft. It **MUST** be purchase through the Hydroplane Racing League – HRL, Coordinator 450-371-6144 ext. 224 – Anne-Marie Leboeuf

Option 2: Comp Cams # 12-675-4
You can buy it directly from any distributor

- A. Stock diameter magnetic steel solid flat tappets lifters. Maximum size 0.842" **No hydraulic lifters**
- B. Stock size push rods only. Size 5/16" all the way. (No titanium or exotic material)
- C. No mushroom or roller tappets. No rev kits.
- D. Double roller or standard timing chain only. No gear drive or belt drive.
- E. Roller rocker arms allowed. **NO** shaft rocker arm systems. 1.50 Ratio Only
- F. Stud girdles allowed.
- G. Valve Springs - Any valve spring may be used, Maximum size: 1.250" (+ or – 0.010") diameter
- H. Spring retainer: steel only, no exotic material
- I. No cam roller bearing allowed
- J. Standard diameter cam bearing only
- K. Any alteration of the original form is prohibited.



During the inspection process the maximum valve lifts are as follows:
(Lobe separation Comp Cam 110° HRL 112°)

Exhaust Lobe			Intake Lobe		
Camshaft:	Comp Cams	HRL	Camshaft:	Comp cam	HRL
Lift	Degrees		Lift	Degrees	
0,050	0	0	0,050	0	0
0,100	6	5,5	0,100	5	5
0,150	11	10,5	0,150	10	10
0,200	16	15,5	0,200	15	15
0,250	20,5	20	0,250	20	19,5
0,300	25,5	25	0,300	24,5	24,5
0,350	31	30,5	0,350	30	30,5
0,400	37	37	0,400	36,5	37,5
0,450	46,5	47	0,450	46,5	49,5
0,476*	60,5	n/a	0,476*	56,5	n/a
0,471**	n/a	59,5	0,471**	n/a	57,5
0,450	73,5	72	0,450	69	66
0,400	82	81	0,400	78	77,5
0,350	88,5	87,5	0,350	85	84
0,300	94	93	0,300	90	89,5
0,250	98,5	98	0,250	95	94,5
0,200	103,5	103	0,200	99,5	99
0,150	108,5	108	0,150	104,5	104
0,100	113,5	113	0,100	109,5	109
0,050	119,5	119	0,050	116	114,5

*Measured Max lift and degree of Comp Cam

** Measured Max lift and degree of HRL Cam

HEAD

Purchase and/or alteration **MUST** be done through the Hydroplane Racing League- HRL, Coordinator 450-371-6144 ext.: 224 – Anne-Marie Leboeuf

(Dart Part #:10021070 Dart Iron Eagle S/S 165)

- A. Heads must have the official HRL stamp on at all times.
- B. Heads must remain **UNALTERED** in any way. Except for flat milling of deck. (No angle milling). Outer edge of valve guide for smaller valve seal and bronze liner allowed.



- C. Valves-Any manufacturer may be used, no titanium or exotic material.
Those specific spec. must be followed:
Exhaust: Diameter: 1.500“, Minimum stem: 0.340”
Intake, Diameter: 1.940“, Minimum stem: 0.340”
No back-cut allowed
Must keep the original standard 45 degree seat angle., swirl polish allowed.
- D. Stem must remain same size all the way.
- E. **9:19: 1** Maximum compression ratio as measured on the ‘whistler’. (max. tolerance +0:10 or 9.29:1)
- F. The number of CC in the head runner should not exceed:intake:175cc exhaust:70cc (+ or - 2cc)
- G. Combustion chamber, intake and exhaust ports must be in the original ‘as cast’ configuration.
- H. Minimum cc in the combustion chamber of 64 cc.
- I. Screw in studs (maximum size 0.4375”) and guide plates allowed.
- J. Any evidence of sanding, polishing, relieving, grinding, porting, chemical treating, ceramic work, abrasive blasting, and alteration of the original form or the addition of material to the ports or combustion chambers is prohibited.
- K. No gasket matching.
- L. Valves must be in stock location and at stock angle.
- N. Dart Iron Eagle S/S 165 tech sheet will be use for thorough inspection.

INTAKE MANIFOLD

- A. Only aluminum intake allowed: Edelbrock 7101 dual plane only.
- B. Cooling bleed lines allowed.
- C. Any evidence of sanding, polishing, relieving, grinding, porting, chemical treating, abrasive blasting, ceramic work, addition of material or any alteration and modification of the original form is prohibited.

CARBURETOR/SPACER

- A. One Holley 4412 carburetor allowed or Holley HP #80583-1
Venturii size: 1.375“, Throttle bore: 1.687“.
- B. The carburetor must pass top and bottom dimension tool specs.
- C. Choke plate may be removed but no removal of choke housing. **Fine tuning of jets, power valves, float bowl, metering block, accelerator pump and nozzles is permitted.**
- D. Standard boosters only and must be tighrly mounted. No annular boosters.
Epoxying or safety wiring of boosters recommended.
- E. No vacuum leaks. No turtles or other induction performance enhancing devices. No other systems allowed.
- F. Two (2) return springs mandatory. An over-center throttle stop is recommended.
- G. Carburetor adapter Bicknell #376 (Max.1.00”) No modification allowed to adapter.
- H. Maximum size thickness straight bore spacer of 1.00”
- I. Maximum of 3 gaskets for 0.225” of total thickness.
- J. No billet metering block



IGNITION

- A. Any factory stock HEI type ignition only.
- B. No crank triggers.
- C. No external super coils.
- D. No aftermarket multiple spark discharge control boxes.
- E. Firing order must remain stock GM: 1.8.4.3.6.5.7.2

OIL SYSTEM

- A. Aftermarket oil pans and breather allowed.
- B. Wet sump Oil pump must remain in stock location.
- C. Dry sumps allowed. Maximum three stages only.
- D. Oil coolers allowed
- E. "Aeroquip" type oil lines only.

FUEL & OIL LINES

- A. Fuel is restricted to gasoline
- B. Any pump fuel allowed.
- C. Specific gravity must fall within the range: .715 to .765 at 60 degrees F
- D. Maximum oxygen content is 4% by weight
- E. Ethanol content must be less than 25% by volume
- F. No alcohol or additives allowed.
- G. Fuel lines must mount in a position to reduce damage, usually on front side of pump.
- H. No fuel lines shall pass through the driver's compartment.
- I. No plastic fuel filters.
- J. No plastic pressure lines - No pressurized fuel tanks.
- K. Any type of fuel pump allowed.(electric pump must be connected to oil pressure switch).

MISC.

The following items may be of any manufacture: gaskets, spark plugs, wires, bearings, filters, fuel lines, hoses, fittings, valve covers, breathers, nuts, bolts, washers, fittings and exhaust system unless specified in these rules.

The technical inspection procedure will be done randomly each weekend. A boat is subject to inspection upon arrival in the pits. There will be two phases of inspection.

The Chief Referee may at all times ask the inspector to proceed with phase 2 of the technical inspection.



Phase 1 (one or any of the following)

1. Hull weight and dimensions
2. Measure Carburetor's throttle plate and venturi
3. Measure carburetor 'spacer and adapter/ or blower
4. Verify intake, head, block, and camshaft
5. Measure compression ratio using Whistler.
6. Valve lift: Intake 0.467'' max and Exhaust: 0.480'' max
7. Fuel test

Phase 2

The engine may be completely taken apart and subjected to a number of analyses.

HRL reserves the right to take to the manufacturer, your camshaft and heads for thorough inspection.

****IF IT IS NOT WRITTEN HERE DO NOT DO
IT****



HRL Engine Rules H - 305 Mod.

This engine configuration will be allowed under the following conditions:

- Not permitted at the first race of the season.
- Cannot be used for more than two consecutive race weekends. In exceptional cases this period could be lengthened after request and approval by HRL.

Any Participants not being within the rules specifications will be penalized as per rules 11.1

The word “stock” as used in these rules is understood to mean the part in question will be used as it was supplied to the general public by the original motor manufacturer. The term “stock replacement” is understood to mean the part is sold to the public as a direct replacement for a stock part, without modification. Its marketed purpose must be for use in rebuilding an engine to stock specifications; not to increase power. The intent of stock replacement parts being included in these rules is to keep cost down and allow the use of readily available parts. No titanium parts are permitted.

ENGINE BLOCK

- A. The engine must be a General Motors V-8 305 Cubic Inch 4 barrel carburetor motor.
- B. Grinding, polishing or blasting any internal part that results in smoothing, recontouring or enlarging is prohibited.
- C. Parts must be used as furnished by General Motors. Alterations are not permitted except as specified herein.
- D. Bore 3.781" max. This allows the use of .040" oversized dished pistons. Stroke 3.480" plus or minus .010.
- E. Flywheel - Any type - 11.000" min. diameter.
- F. Starter - Any starter that functions like the stock starter. No inertia starters.
- G. Crankshaft main bearing journals and rod journals may be reground. Stock configuration of crankshaft counterweights must be maintained in the balancing process. Knife edging and chamfering of these weights are prohibited.
- H. Cylinder blocks may be bored, honed, align bored, deburred and resurfaced in order to achieve the desired deck height or protrusion of the pistons. Deburring is not to be confused with grinding/polishing. Grinding and polishing are prohibited. For the purpose of salvaging a damaged cylinder block, a maximum of four cylinders and/or a maximum of four lifter bores may be sleeved. Engines may be painted internally to enhance oil flow. External parts may be painted or chromed to enhance appearance. All



unnecessary parts outside of the engine may be removed to permit installation into the boat. Water and Oil passages may be blocked, water passages may be modified. Lifter valley baffles, stand pipe and/or screens are permitted.

PISTONS

A. Pistons must be stock General Motors dished piston or TRW part #3028F or casting #454NP on side of pin boss. It is important to note that the pistons manufactured after 5/95 are being shipped with the dish "as cast." This means the dish area of the piston must be machined before the piston will meet the requirements of the rule. See drawing for dish dimensions. Pistons may be balanced and the dish machined, no other modifications will be allowed. The pistons listed above may be reversed.

In addition to the above-mentioned pistons, the following parts may be used.

J/E Piston Part #174002 Pin # 9272850-1551S: piston must be embossed with the APBA logo.

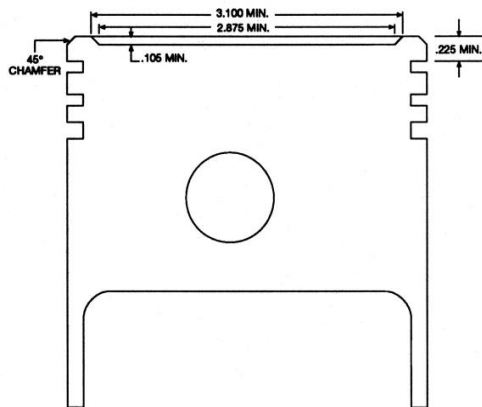
The following Big Journal I Beam press fit rods will be permitted:

Manley Part # 14112A8

Eagle Part # SIR5700BPLW

Lunati Part # LHAF

Scat part # 2ICR5700P



Scat Part # 2ICR5700P

Scat Part # 3ICR5700P

Crower Part # SP91200

No changes or alterations can be made to these parts. This includes balancing.

B. Piston Rings - Must be of the type supplied by General Motors.

The 1st and 2nd rings (compression) must be 1 piece design, .078" +.003" wide. 3rd ring (oil) must be 3 piece design, consisting of 2 rails and 1 expander.



HEAD

- A. Any cylinder head that was supplied by General Motors on a 305 2 barrel motor with the correct valve size may be used. The minimum combustion chamber volume is 59cc. Angle milling is not permitted.
- B. Intake valves: Ferrea # 5161-8 ONLY. No modification allowed.
- C. Rocker Arms - Stock or Roller Rocker allowed. 1.50 Ratio.
- D. Only camshaft allowed: Crane Cam part #: 113941 must remain unaltered in any way.
- E. Lifters - Stock or stock replacement. Solid lifters may be substituted for hydraulic lifters. No mushroom or roller lifters.
- F. Valve Springs - Any valve spring may be used that fits the stock 1.260" retainer. Spring retainer must be stock or stock replacement.
- G. Camshaft sprockets, crankshaft sprockets and chain may be any "chain type." No belt or gear drives.
- H. Push Rods - Stock or stock replacement.
- I. Exhaust valves: Any stock or stock replacement steel valve may be used as long as the stock stem diameter is maintained throughout (no reduced diameter, undercut stems). Face angle: 45 degrees only. Intake and exhaust head diameter tolerance +/- 0.005" unless otherwise noted. Stainless steel valves may be used. Back cutting the valve (relief angle) is not permissible. Titanium, hollow stem, or sodium filled valves are not permitted. Maximum size 1.500"
- J. Cylinder heads may be flat milled in order to achieve allowable combustion chamber volume. Machining of valve seats and valves must meet class specifications as well as all components used in the head and valve train. Push rod length is non inspectable but must be steel or chrome only and stock diameter.
- K. Maximum compression ratio 9:10 (tolerance of 0:10)

CARBURETOR

- A. Carburetor: Holley 4brl. 600 CFM # 0-4776C
Venturii size: primary 1.250", secondary 1.312"
Throttle bore: primary and secondary 1.562"
No polishing or other modifications allowed, including the following parts:
 - Accelerator pump.
 - Power valve (may not be removed).
 - Float assembly and float bowl (except adjustment of float lever).
 - Throttle plate, throttle shaft and screws.
 - Air horn.
- B. Only carburetor choke mechanism components may be remove. No machining to choke horn allowed
- C. 1 Canton spacer 1.000" # 85-160(no modification allowed) plus 2 gaskets for a total thickness of 1.250".



INTAKE MANIFOLD

- A. Intake Manifold: Edelbrock # 7101, the manifold may be milled on head mating surface and may be milled on carburetor mounting surface to compensate for engine angle.

IGNITION

- A. Distributor - Any single fire electronic or points distributor that fits the engine without modification is permitted. Magneto crank triggered or multiple spark discharge systems are not permitted.

FUEL AND OIL LINES

Oil pan, oil pump and oil pickup may be modified as necessary. Remote filter, oil cooler, and oil accumulator are permitted. One oil accumulator with two quart maximum volume is permitted, connected by a single oil line.

- A. Fuel Pump - Any mechanical diaphragm type. No pressurized fuel tanks.
- B. Oil Pump - Any General Motors oil pump that fits in the stock location without modification may be used. Oil pickup tube and bypass spring may be modified.
- C. Oil Pan - Any oil pan or baffles may be used.
- D. Wet sump oil pump must remain in stock location.
- E. Dry sumps allowed. Maximum 3 stages.
- F. Fuel is restricted to gasoline
- G. Any pump fuel allowed.
- H. Specific gravity must fall within the range: .715 to .765 at 60 degrees F
- I. Maximum oxygen content is 4% by weight
- J. Ethanol content must be less than 25% by volume
- K. No alcohol or additives allowed.
- L. Fuel lines must mount in a position to reduce damage, usually on front side of pump.
- M. No fuel lines shall pass through the driver's compartment.
- N. No plastic fuel filters.
- O. No plastic pressure lines - No pressurized fuel tanks.

MISC.

- A. The following items may be of any manufacture: gaskets, spark plugs, wires, bearings, filters, fuel lines, hoses, fittings, valve covers, timing, chain covers, breathers, nuts, bolts, washers, fittings and exhaust system.
- B. The following machining procedures and parts are permitted:
 - 1. Engines may be clearanced.



2. Rotating and reciprocating parts may be balanced.
3. The block may be decked. Top of piston must be below the top surface of the compressed head gasket a minimum of .030".
4. Intake and exhaust valve seats may be narrowed by cutting at 90 degrees or less, not to exceed 1" from combustion surface in bowl area on intake and exhaust side of seat.
5. Inner intake seat diameter not to exceed 1.625".
6. Intake and exhaust valve parts may not be altered in any way. Polylocks are permitted. Bronze wall valve guides are permitted.
7. Valve guide seals are permitted.
8. Push rod guide plates are permitted.
9. Rocker arm studs may be pinned or screw in studs used.
10. Stud girdled allowed.
11. Cylinder walls may be sleeved.
12. Water and oil passages may be blocked.
13. A velocity stack or tube may be affixed to the carburetor.
14. Valve spring seats may be machined.
15. Rotating and reciprocation components of the engine may be balanced. Total assembly may not be lightened in an effort to gain added performance.

The technical inspection procedure will be done randomly each weekend. A boat is subject to inspection upon arrival in the pits. There will be two phases of inspection.

The Chief Referee may at all times ask the inspector to proceed with phase 2 of the technical inspection.

Phase 1 (one or any of the following)

1. Hull weight and dimensions
2. Measure Carburetor's throttle plate and venturi
3. Measure carburetor 'spacer and adapter/ or blower
4. Verify intake, head, block, and camshaft
5. Measure compression ratio using Whistler.
6. Fuel test

Phase 2

The engine may be completely taken apart and subjected to a number of analyses.

****IF IS NOT WRITTEN HERE DO NOT DO IT****



HRL Engine Rules H – 350 Crate

This engine configuration will be allowed under the following conditions:

- Not permitted at the first race of the season.
- Cannot be used for more than two consecutive race weekends. In exceptional cases this period could be lengthened after request and approval by HRL.

This crate engine rules are only for the 7 original crates bought through Régates de Valleyfield. If an owner wants to sell his engine, he must inform HRL.

Any participant not being within the rules specifications will be penalized as per rule 11.1

ENGINE BLOCK

- A. Stock production style Chevy V8 engine. No Bowtie blocks allowed.
- B. Must be cast iron block with standard external measurements only.
- C. Maximum 358 cubic inches
- D. No removing of identification numbers. No grinding or lightening.
- E. A maximum of 3 sleeves in cylinders and 7 sleeves in lifter holes. (no index lifter holes)
- F. SFI type flywheel - 153 teeth
- G. Starter - Any starter that functions like the stock starter. No inertia starters.

CRANKS

- A. Minimum 50-lb.(including balancing) Steel magnetic cranks only.
- B. Stock stroke for block. 3.480“. (+ or - 0.010“)
- C. Unaltered except for normal cleanup and balancing.
- D. Cranks should not be contoured or sculptured.
- E. Stock main journal and rod journal sizes only. 2.4450”main/2.100”rod.
(undercut maximum 0.030“)
- F. No knife edge allowed

CONNECTING RODS

- A. Any large journal magnetic steel type connecting rods only.
- B. No titanium OR aluminum rods.
- C. 5.700” maximum length. (+ or - 0.010“)
- D. Minimum weight of rods 560 grams (cap and bolt included)
- E. Full floating pins recommended.



PISTONS

- A. Any piston may be used. Pistons must be in stock configuration. Piston skirt must be a full round. No FSR.
- B. No portion of the piston may protrude above the top of the block and that without any head gaskets.
- C. No gas porting of piston ring lands and no top of piston coating of any kind.
- D. The weight of each piston should not be less than 590 grams including the wrist pin and "C" clips and rings.
- E. Piston Rings - Must be of the type supplied by General Motors. The 1st and 2nd rings (compression) must be 1 piece design, 3rd ring (oil) must be 3 piece design, consisting of 2 rails and 1 expander. Moly file fit allowed. Pistons ring size: Minimum thickness of rings 1.500mm for top and second, 3.00mm for oil control ring.
- F. Ring lands must remain in standard location. Minimum distance between top of piston and top of first ring (compression) 0.180"
- G. No gapless rings allowed
- H. Maximum size over standard piston allowed (0.040")
- I. Minimum weight of total assembly of piston, connecting rod, "C" clip, pin, rings : 1150g

CAMSHAFT & VALVETRAIN& HEAD

Option 1:

Original GM cam shaft, number: 24502476 ONLY

- A. Stock diameter magnetic steel hydraulic or solid flat lifters. Maximum size 0.842"
- B. Stock size push rods only. Size 5/16" all the way.(no titanium or exotic material)
- C. No mushroom or roller tappets. No rev kits.
- D. Double roller or standard timing chain only. No gear drive or belt drive.
- E. Stamp steel rockers only 1.50 Ratio
- F. No stud girdles allowed.
- G. Valve Springs - Any valve spring may be used that fits the stock retainer. Spring retainer must be stock or stock replacement. 1.250" (+ or - 0.010")
- H. No cam roller bearing allowed
- I. Standard diameter cam bearing only
- J. Any alteration of the original form is prohibited.

HEAD

Stock Chevy 350 Vortec heads only.

Casting numbers #12558062 or #10239906

- A. Heads must remain **UNALTERED** in any way. Except for flat milling of deck. No angle milling.



- B- Valves-Any manufacturer may be used, no titanium or exotic material.
Those specific spec. must be followed:
Exhaust: Diameter: 1.500“, Minimum stem: 0.340”
Intake, Diameter: 1.940“, Minimum stem: 0.340”
No back-cut allowed
Must keep the original standard 45 degree seat angle
- C. Stem must remain same size all the way.
- D. **9:19** Maximum compression ratio as measured on the ‘whistler’. (max. tolerance +0:10)
- E. The number of CC in the head runner should not exceed:
intake:170cc exhaust: 57cc (+ or - 2cc)
- F. Combustion chamber, intake and exhaust ports must be in the original ‘as cast’ configuration.
- G. Minimum cc in the combustion chamber of 59 cc.
- H. Screw in studs (maximum size 0.4375”) and guide plates allowed.
- I. Any evidence of sanding, polishing, relieving, grinding, porting, chemical treating, ceramic work, abrasive blasting, and alteration of the original form or the addition of material to the ports or combustion chambers is prohibited.
- J. No gasket matching.
- K. Valves must be in stock location and at stock angle.

Option 2:

CAMSHAFT & VALVETRAIN & HEAD

Purchase MUST be done through the Hydroplane Racing League – HRL, Coordinator
450-371-6144 ext.: 224 – Anne-Marie Leboeuf

- A. Stock diameter magnetic steel hydraulic or solid flat tappets. Maximum size 0.842”
- B. Stock size push rods only. Size 5/16” all the way.(no titanium or exotic material)
- C. No mushroom or roller tappets. No rev kits.
- D. Double roller or standard timing chain only. No gear drive or belt drive.
- E. Roller rocker arms allowed. NO shaft rocker arm systems. 1.50 Ratio Only
- F. Stud girdles allowed.
- G. Valve Springs - Any valve spring may be used, maximum size 1.250 (+ or – 0.010”) diameter
- H. Spring retainer , steel only, no exotic material.
- I. No cam roller bearing allowed
- J. Standard diameter cam bearing only
- K. Any alteration of the original form is prohibited.



HEAD

Purchase MUST be done through the Hydroplane Racing League – HRL, Coordinator
450-371-6144 ext.: 224 – Anne-Marie Leboeuf

- A. Heads must have the official HRL stamp on at all times.
- B. Heads must remain **UNALTERED** in any way. Except for flat milling of deck. No angle milling. Outer edge of valve guide for smaller valve seal. Linner allowed
- C. Valves-Any manufacturer may be used, no titanium or exotic material. Those specific spec. must be followed:
Exhaust: Diameter: 1.500“, Minimum stem: 0.340”
Intake, Diameter: 1.940“, Minimum stem: 0.340”
No back-cut allowed
Must keep the original standard 45 degree seat angle, swirl polish allowed
- D. Stem must remain same size all the way.
- E. **9:19** Maximum compression ratio as measured on the ‘whistler’. (max. tolerance +0:10)
- F. The number of CC in the head runner should not exceed:
intake:165cc exhaust:65cc (+ or - 2cc)
- G. Combustion chamber, intake and exhaust ports must be in the original ‘as cast’ configuration.
- H. Minimum cc in the combustion chamber of 64 cc.
- I. Screw in studs (maximum size 0.4375”) and guide plates allowed.
- J. Any evidence of sanding, polishing, relieving, grinding, porting, chemical treating, ceramic work, abrasive blasting, and alteration of the original form or the addition of material to the ports or combustion chambers is prohibited.
- K. No gasket matching.
- L. Valves must be in stock location and at stock angle.
- M. Dart Iron Eagle S/S 165 tech sheet will be use for thorough inspection.

INTAKE MANIFOLD

With Option 1: Only aluminum intake allowed: GM # 12366573

With Option 2: Edelbrock 7001 dual plane only.

- A. Cooling bleed lines allowed.
- B. Any evidence of sanding, polishing, relieving, grinding, porting, chemical treating, abrasive blasting, ceramic work, addition of material or any alteration and modification of the original form is prohibited.

CARBURETOR / SPACER

- A. One Holley 4412 carburetor allowed or Holley HP #80583-1 Venturii size: 1.375“, Throttle bore: 1.687“.
- B. The carburetor must pass top and bottom dimension tool specs.



- C. Choke plate may be removed but no removal of choke housing. Fine tuning of jets, power valves, float bowl, metering block, accelerator pump and nozzles is permitted.
- D. Standard boosters only and must be tightly mounted. No annular boosters.
Epoxying or safety wiring of boosters recommended.
- E. No vacuum leaks. No turtles or other induction performance enhancing devices.
No other systems allowed.
- F. Two (2) return springs mandatory. An over-center throttle stop is recommended.
- G. Carburetor adapter Bicknell #376 (Max.1.00") No modification allowed to adapter.
- H. Maximum size thickness straight bore spacer of 1.00"
- I. A maximum of 3 gaskets for 0.225" of total thickness

IGNITION

- A. Any factory stock HEI type ignition only.
- B. No crank triggers.
- C. No external super coils.
- D. No aftermarket multiple spark discharge control boxes.
- E. Firing order must remain stock GM: 1.8.4.3.6.5.7.2

OIL SYSTEM

- A. Aftermarket oil pans and breather allowed.
- B. Wet sump Oil pump must remain in stock location.
- C. Dry sumps allowed. Maximum three stages only.
- D. Oil coolers allowed
- E. "Aeroquip" type oil lines only.

FUEL & OIL LINES

- A. Fuel is restricted to gasoline
- B. Any pump fuel allowed.
- C. Specific gravity must fall within the range: .715 to .765 at 60 degrees F
- D. Maximum oxygen content is 4% by weight
- E. Ethanol content must be less than 25% by volume
- F. No alcohol or additives allowed.
- G. Fuel lines must mount in a position to reduce damage, usually on front side of pump.
- H. No fuel lines shall pass through the driver's compartment.
- I. No plastic fuel filters.
- J. No plastic pressure lines - No pressurized fuel tanks.

- K. Any type of fuel pump allowed.(electric pump must be connected to oil pressure switch).



MISC.

The following items may be of any manufacture: gaskets, spark plugs, wires, bearings, filters, fuel lines, hoses, fittings, valve covers, breathers, nuts, bolts, washers, fittings and exhaust system unless specified in these rules.

The technical inspection procedure will be done randomly each weekend. A boat is subject to inspection upon arrival in the pits. There will be two phases of inspection.

The Chief Referee may at all times ask the inspector to proceed with phase 2 of the technical inspection.

Phase 1(one or any of the following)

1. Hull weight and dimensions
2. Measure Carburetor's throttle plate and venturi
3. Measure carburetor 'spacer and adapter/ or blower
4. Verify intake, head, block, and camshaft
5. Measure compression ratio using Whistler.
6. Fuel test

Phase 2

The engine may be completely taken apart and subjected to a number of analyses.

HRL reserves the right to take to the manufacturer, your camshaft and heads for thorough inspection.

****IF IS NOT WRITTEN HERE DO NOT DO IT****



ANNEX C

HRL Engine Rules 2.5L Class and Formula 2500

Any participant not being within the rules specifications will be penalized as per rule 11.1

- A- The word “stock” as used in these rules is understood to mean the part in question will be used as it was supplied to the general public by the original motor manufacturer.
- B- The term “stock replacement” is understood to mean the part is sold to the public as a direct replacement for a stock part, without modification. Its marketed purpose must be for use in rebuilding an engine to stock specifications; not to increase power. The intent of stock replacement parts being included in these rules is to keep cost down and allow the use of readily available parts. No titanium parts are permitted.
- C- Only approved engine is the Ford 2.3 Litre.
- D- Parts must be used as furnished by Ford. Alterations not permitted except as specified herein.
- E- If other parts from other manufacturers are to be allowed, they will only be those listed in these specifications.
- F- NOT PERMITTED: gear boxes or devices that alter the speed or direction of power from the motor to propeller.
- G- All parts outside of engine may be removed to permit installation into boat, with the exception of the carburetor and distributor.
- H- Engine may be clearanced. Rotating and reciprocating parts may be balanced.
 - Points, piston rings, spark plugs, bearings, timing belts, resistors, filters, plug wires, fuel lines, condensers may be any stock or replacement parts of any manufacturer sold over the counter to and for the general automobile trade. Gapless or other racing type non-stock configuration rings are not permitted.
- I- Fuel. (See HRL H350 class rule)
- J- Grinding, polishing or blasting any internal part that result in smoothing, recontouring or enlarging is prohibited. Configuration changes in any way on the Ford 2.3 Litre engine are prohibited.
- K- Oil pan, oil pump and oil pickup may be modified as necessary but must remain a wet sump system. Remote filter, oil cooler, and oil accumulator are permitted. One oil accumulator with two quart maximum volume is permitted, connected by a



single oil line. Baffle in oil pan is permitted. Any oil filters or valve cover breathers are permitted.

L- Gaskets, spark plugs, wires, bearings, filters, fuel lines, hoses, fittings, valve covers, timing chain covers, breathers, nuts, bolts, washers, fittings and exhaust system may be of any manufacturer. Studs may be used in place of bolts.

ENGINE BLOCK & CRANKSHAFT

- A. Cylinder blocks may be bored, honed, align bored, deburred and resurfaced in order to achieve the desired deck height or protrusion of the pistons. Deburring is not to be confused with grinding/polishing. Grinding and polishing to reduce weight and/or gain a performance advantage are prohibited. Engines may be painted internally to enhance oil flow. External parts may be painted or chromed to enhance appearance. All unnecessary parts outside of the engine may be removed to permit installation into the boat. Water and Oil passages may be blocked, water passages may be modified. Lifter valley baffles, stand pipe and/or screens are permitted in stock engines.
- B. Rotating and reciprocation components of the engine may be balanced. Total assembly may not be lightened in an effort to gain added performance.
- C. Sleeves may be installed to repair worn or damaged cylinder bores.
- D. Bore 3.825 maximum and stroke 3.126 maximum.
- E. Flywheels: aluminum flywheels are mandatory. The ring gear shall remain stock with 132 teeth or the 2000 Pinto ring gear with 135 teeth and a minimum wall thickness of 0.468 inches must be maintained throughout the aluminum plate except for pilot and mounting holes. No additional holes permitted. Spot removal of material for balancing purposes only is permitted.
- F. Water passages may be blocked.
- G. Windage tray and/or crankshaft wipers are permitted
- H. Starter: any starter that functions like the stock starter. Blocks may be clearanced to allow for starter installation only.
- I. Crankshaft main bearing journals and rod journals may be reground. Stock configuration of crankshaft counterweights must be maintained in the balancing process. Knife edging and chamfering of these weights are prohibited.



PISTON & CONNECTING RODS

- A. Connecting rods may be bushed for the use of floating pins.
- B. Federal Mogul #H435P or #495P, additionally SRP #148221 or #148222. Pistons may not be reversed. The minimum distance from the top of the piston to the top of the first ring shall be no less than: Federal Mogul: 0.245", SRP: 0.195". Straight walled piston pins as received from the piston manufacturer shall be used. Piston rings must be of the type supplied by Ford. The first and second rings (compression) must be one piece design. The third ring must be a three piece design consisting of two rails and one expander.

HEAD, CAMSHAFT and VALVETRAIN

The following items (A to F) are to be included in both option 1 and 2.

- A. Cylinder heads may be flat milled in order to achieve allowable combustion chamber volume. Machining of valve seats and valves must meet class specifications as well as all components used in the head and valve train.
- B. Parts must be used as furnished by Ford or OMC. No alterations permitted except as specified herein.
- C. Bronze wall valve guides are permitted. Valve guides may be machined to accept any stock or stock replacement valve stem oil seals. Replacement valve seats are permitted (must meet OEM specifications.)
- D. Camshaft: Any aftermarket cam can be used providing it meets profile under these class rules. Maximum lift at valves 0.402 inches (+ or- 1%). (See inspection procedure to check camshaft.). Cam may be advanced or retarded.
- E. Lifters: any stock or stock replacement hydraulic lifter may be used. Anti-pump up lifters are permitted.
- F. Rocker arms will be stock or stock replacement with a ratio of 1.64 to 1. Roller rocker arms are not permitted. Stock replacement followers with wear pads.

Cylinder Head Option 1:

- A. Any cast iron cylinder head supplied by Ford with correct valve size may be used that meets the minimum chamber volume (heart shaped chambers do not meet the minimum). Dual plug heads prohibited. Angle milling is not permitted. No changes are permitted in the valve area. The following Ford 2.3 conversion head plates may be used: Goodson Automotive part number FAP-2300-EFI or K-Line part number KL9661. This plate may be fitted to the cylinder head. Total thickness of adapter mounting flange and 2 gaskets (1 each side) not to exceed .500" total combined.



- B. Valve head diameter: Intake valve 1.735". Intake valve may have 20 degrees back cut, not to exceed .205 in width. Exhaust valve 1.500" with no back cut. Intake and Exhaust valve seats may be narrowed by cutting at 90 degrees or less, not to exceed .250 from combustion surface into bowl area. Minimum valve stem diameter: 0.340".
- C. Valves: Any stock or stock replacement steel valve may be used as long as the stock stem diameter is maintained throughout (no reduced diameter, undercut stems). Face angle: 45 degrees only. Intake and exhaust head diameter tolerance +/- 0.005" unless otherwise noted. Stainless steel valves may be used. Back cutting the valve (relief angle) unless defined within the specific class rules is not permissible. Swirl, Titanium, hollow stem, or sodium filled valves are not permitted.
- D. Valve Springs: Any spring that fits the head without machining. Maximum spring O.D. 1.460", no conical springs permitted. Any stock or stock steel replacement retainer that fits the stock keepers may be used. Retainer must not be modified.

Cylinder Head Option 2:

Casting flash may be remove from the lifter valley

Esslinger Ford Aluminium D-port , Ford part number M-6049-E23A
Purchase MUST be done through the Hydroplane Racing League – HRL,
Coordinator 450-371-6144 ext.: 224 – Anne-Marie Leboeuf

- A. Heads must have the official HRL stamps on at all times.
- B. Heads must remain UNALTERED in any way. Except for flat milling of deck. (No angle milling). No changes are permitted in the valve area. Bronze liner allowed.
- C. Valves: Exhaust: Manley # 11793 and 11795. Single 45 degree angle only
Intake: Manley # 11792 and 11794. Single 45 degree angle only
- D. Valve Springs: Maximum spring O.D. 1.460", no conical springs permitted. Any steel replacement retainer (1.460" max diameter) and keepers permitted, no titanium. Spring seat may be machined to accept hardened spring seats and 1.460" valve springs.
- E. Combustion chamber: minimum 61 cc.
- F. Intake and Exhaust valve seats may be reworked (valve job) but touching and/or altering the aluminum part of the bowl is prohibited.



INTAKE, CARBURETOR and FUEL SYSTEM

- A. Intake manifold OMC part number #912470 or Esslinger engineering part# 2724.5 (626-444-4919).
- B. Carburetors: Any Rochester 2 GC carburetor will be allowed as long as the throttle bore diameter is no larger than 1.690 and venturi diameter is no larger than 1.320. Additionally, Holley model 2300 part #0-4412 and HP 0-80583-1 venturi diameter 1.380 max., throttle bore diameter 1.690 max. Holley #2300, part #0.7448 and HP 0-80787-1 two jet venturi size 1.190 max., throttle plate size 1.502 max. 350 CFM carburetor. Removal of air cleaner base for installation into boat is permitted. Must be a booster type carburetor. No polishing allowed. Choke plate may be removed, but choke horn must remain untouched, only the original components of the carburetor manufacturer may be used (No billet metering blocks, or boosters), however, Holley jets may be used in the Rochester carburetor. Fine tuning of jets, power valves, float bowl, metering block, accelerator pump and nozzles is permitted.
- C. Throttle shaft may be altered or modified for connecting to the throttle cable. No thinning of throttle shaft is allowed; must maintain stock diameter.
- D. A carburetor wedge may be used. The total dimension of wedge and gaskets measured from the intake manifold to carb base shall not exceed 1.250 inches.
- E. Fuel pump: must be original stock or stock replacement mechanical or electric fuel pump sold on open market for general automobile trade. A fuel pressure regulator may be used.
- F. Carburetor choke mechanism components and air filter tie-down bars may be removed on Rochester Carburetor.
- G. Velocity tube or ram type air scoop on carburetor is permitted.
- H. Port matching of the intake and the spacer is allowed by grinding the inside of the intake plenum to a maximum of 0.750" deep.

FUEL & OIL LINES

- A. Fuel is restricted to gasoline
- B. Any pump fuel allowed.
- C. Specific gravity must fall within the range: .715 to .765 at 60 degrees F
- D. Maximum oxygen content is 4% by weight
- E. Ethanol content must be less than 25% by volume
- F. No alcohol or additives allowed.
- G. Fuel lines must mount in a position to reduce damage, usually on front side of pump.
- H. No fuel lines shall pass through the driver's compartment.



- I. No plastic fuel filters.
- J. No plastic pressure lines - No pressurized fuel tanks.
- K. Any type of fuel pump allowed.(electric pump must be connected to oil pressure switch).

IGNITION

A. Distributor: Any single fire electronic or point distributor that fits the engine without modification is permitted. Magneto crank triggered or multiple spark discharge systems are not permitted.

INSPECTION PROCEDURE

The technical inspection procedure will be done randomly each weekend. A boat is subject to inspection upon arrival in the pits. There will be two phases of inspection.

The Chief Referee may at all times ask the inspector to proceed with phase 2 of the technical inspection.

Phase 1 (one or any of the following)

1. Measure Carburetor. Throttle bore and venturii (procedure 1.1)
2. Measure carburetor wedge and gaskets
3. Verify intake, carburetor, head, block, and camshaft
4. Hull weight and dimensions
5. Fuel (specs. at HRL H350 engine rule)
6. Check cam/valve action (Procedure 8.1)

Phase 2

The engine may be completely taken apart and subjected to a number of analysis like:

- A. Check all parts for any grinding, polishing and any other alterations from the furnished stock configuration. However, the distributor intermediate shaft is not inspectable.
- B. Check combustion chamber: Minimum distance from top ring to the top of the piston: Federal Mogul: 0.245", SRP: 0.195". 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.
- C. Check valve train: Valve sizes and face angle.

PROCEDURE

- 1.1 Check carburetor Rochester: Venturi - 1.320 inches diameter maximum. Throttle bore 1.690 inches diameter maximum. Holley #0-4412 or HP 0-80583-1, venturi



1.380 max., throttle bore 1.690 max. Holley #0-7448 or HP 0-80787-1, venturi
1.190 max, throttle bore 1.502 max.

1.2 Check cam/valve action: Install adjustable lifters in place of hydraulic lifters on one intake and one exhaust valve. Set dial indicator on intake valve spring retainer. Install an 8 inch degree wheel on cam pulley bolt. Install a pointer on block. It is recommended that the degree wheel have one degree markings. To read angles to one degree, rotate the cam until the lobe is clear of the rocker arm. Adjust the valve to zero lash and set the dial indicator to zero. Set the degree wheel to zero degrees, rotate the cam in normal direction of rotation to 0.050 inches valve lift. Set the degree to 17 degrees. Repeat for each 0.050 of increasing and decreasing valve lift as shown in the table. At the point of maximum lift, note the angular width of the flat area. Repeat with the exhaust valve. Compare recorded data with the table data.

Valve Lift Thousandths	Intake Angle Degrees	Exhaust Angle Degrees
.050	17	17
.100	22	22
.150	27	27
Opening 200	32	32
Ramp 250	37	37
.300	43	43
.350	51	51
.400	67	67
.402*	70*	70*
Max lift at valve with zero lash		
.402*	73*	72*
.400	75	74
.350	91	90
.300	99	99
Closing .250	105	104
Ramp .200	110	110
.150	115	115
.100	120	120
.050	126	126

*Edge readings for “flat” area.

1.3 Check lobe spacing (Use setup of prior check): Set dial indicator on intake valve spring retainer. Rotate the cam until the heel is clear of the rocker arm. Adjust valve to zero lash and stop at .0005 inches valve lift. Set the degree wheel to zero degrees. Rotate the cam in normal direction of rotation to 0.050 inches valve lift. Record the degree wheel reading. Repeat the above procedure on the exhaust valve except that the degree wheel is not reset to zero. The two angle recordings are subtracted to obtain lobe spacing; 111 degrees.

1.4 Inspector may disassemble hydraulic lifter to insure it is approved. Inspector will inspect the Lifter Boss in the head for any alterations. The Inspector will verify that the lifter is hydraulic by compressing the lifter to a min. of .175.



****IF IT IS NOT WRITTEN HERE DO NOT DO IT****

ANNEX D

INBOARD RULE FOR AIR SYSTEMS

- 1- All competing boats must be equipped with air at all times.
- 2- No manually activated mechanisms shall be permitted.
- 3- The mask must cover the mouth and nose and be attached in such a way as to prevent its being dislodged or removed inadvertently and must be worn by the driver anytime the boat is under power.
- 4- All inboard boats with a permanent onboard system must carry a minimum 30 cubic feet of air and be held in place by two supports or moulded support straps.
- 5- All inboard boats with an ambient air system must have a minimum 6 cubic feet of air and held in place by adjustable leg holsters or moulded support straps.
- 6- All air systems permanent or part time shall carry air in a vessel approved and certified for the delivery of breathing air. Said vessel must meet D.O.T. (Department of transportation) standards or T.C. (Transportation Canada) for such devices.
- 7- All boats must have identification stamped or plates on the bottom of the boat to identify which system of air is being used. Air and the letter (F) for permanent air systems and Air and the letter (A) for all boats using ambient air systems. The identification must also show that the system has been certified and meets either D.O.T. or T.C. standards. All components of the air system must have been made to be used with compressed air and to withstand the pressures that they will be subjected to.
- 8- Air hoses must be between ten (10) and fifteen (15) feet long measured starting at the center of the steering wheel and doubly protected.
- 9- Two quick connect male couplers must be installed between the first stage regulator and the second stage regulator located between ten (10) and fifteen (15) feet from the driver's mask or helmet except when using leg holsters.
- 10- When using stainless couplers use the Parker 60 series part number SH1-62/SH1-63. When using brass couplers use part number BH1-60/Bh1-61 with ball stop mechanism.
- 11- All connections in the air system must be done with commercially accepted or SCUBA type high pressure crimped at both ends. Hose clamps are not allowed.



ANNEX E

HRL RESCUE TEAM CAPSULE TRAINING PROCEDURES

- **IMMERSION TEST WITH AIR SYSTEM**

All Drivers taking part in HRL events must first pass an immersion test using their air system. Drivers must first give a demonstration of their air system.

It is recommended that you have access to a professional training course on assembling and using proper equipment. PADI, BSAC and SAA are organisations that offer this type of training. By mentioning the criteria for the test you must take it will be possible for them to set up a training schedule to meet your needs.

THE IMMERSION TEST

It simulates being turned upside down in a safety capsule under water. Each driver will have two tries each lasting about 15 seconds. In the first test the water will be clear and in the second test the water will be darkened.

- **PROCEDURES**

The rescue team has verified the procedures that will be given to you.

The test will be done using a reinforced capsule. The capsule will be turned over in such a manner that the strapped in driver is completely submerged under water.

The following equipment is part of the capsule:

- 1- An opening not larger than those found on reinforced capsules. The sides of the capsule should not be lower than the shoulders of the driver.
- 2- A harness such as those used in hydroplanes.
- 3- A steering wheel such as those used in hydroplanes.

- **PERSONNEL EQUIPMENT (DRIVER'S)**

Drivers must wear the following personnel equipment:

- 1- Racing suit.
- 2- Shoes.
- 3- Gloves, if normally worn by the driver.
- 4- Helmut.
- 5- Air system – We will supply the necessary air bottle.

- **PRECAUTIONS**

The rescue team must insure that the divers are properly trained to get drivers out in panic situations. Furthermore the team must have someone qualified in CPR present for the entire test session. Every sequence will be explained to the driver before the test begins.



- **EXAMIN SEQUENCE**

- 1- A complete roll over using all the equipment, harness and closed canopy in clear water.
- 2- - A complete roll over using all the equipment, harness and closed canopy in dark water.
- 3- The driver must wait for the signal from the diver before beginning manoeuvres.

- **PERFORMANCE EVALUATION**

The test is considered successful when a driver remains calm and comes to the surface in less than 30 seconds.

- **HELPFUL HINTS**

The capsule will be overturned and the security diver will signal you or tap on you. Under the supervision of the diver the driver must get out of the capsule in the following manner.

- 1- The capsule will be overturned.
- 2- The diver will signal the driver to begin.
- 3- The driver will unhook the canopy straps and open the canopy.
- 4- The driver will take off the steering wheel.
- 5- The driver will undo the safety harness.
- 6- The driver will place his hands on the sides of the canopy and do a forward roll to get out of the cockpit and move to the surface.

Exam failure may be due to the following points:

- 1- You moved before the diver gave you the signal.
- 2- You were unable to remove the canopy straps, steering wheel, or safety harness.



ANNEX F

SAFETY INSPECTION of HRL HULLS

SAFETY INSPECTION

Hull safety inspectors must inspect all hulls registered with HRL once a year using the official document “Safety Inspection Control” supplied by HRL. The Inspectors shall at the first race of the season or the first time a competitor participates in a race verify that the hydroplane meets all the regulations pertaining to safety. If a hydroplane does not meet all the safety requirements it may not participate until the necessary corrections are made and approved. Once a hull has been approved by the inspectors an adhesive safety sticker will be affixed to the back of the boat.

The Inspectors reserve the right to proceed with a safety inspection the moment a hydroplane enters the pits.

If an irregularity is observed the inspectors will classify the problem as follows:

Level 1- Non conformity noted – hydroplane not authorized to race.

Level 2- Divergence found – authorized to race / repair before next race.

Level 3- Involved in an accident – repairs must be done before the next event.

The Inspectors must fill out a report concerning the irregularity and remove the safety sticker for level 1 & 3. For level 2 the safety sticker will be marked with a big number “2”. Copies of the report shall be submitted to the Referee, HRL and the Driver. The hydroplane must be re-inspected at the following event. The Driver must present his copy of the inspection report before he can be authorized to race. Only HRL Inspectors are authorized to approve any corrections.

When an Inspector approves the modifications he will place a new safety inspection sticker on the hydroplane. The Inspector will also take a copy of the report of non-conformance from the owner, fill out the section regarding the correction and send it to the HRL office to be filed.

On no occasion shall a hydroplane be given a second chance to participate with a Level 2 infraction. Falsification of inspection documents results in an automatic suspension and will be discussed by the HRL committee. A decision will be made after examining the facts.

It is the Drivers or owners responsibility to insure that the hydroplane passes a safety inspection. At the referees discretion a new inspection may be ordered or after an accident before returning to competition.

Where a boat is damaged in an accident an inspection must be made by one of the inspectors before the boat can return to competition. The driver must point out to the inspectors any non-conformity to the rules.

Following a major accident of a hydroplane the inspectors must do a thorough inspection of the hull and send a copy of the report to the HRL group. At the owners request a copy of the report will be given to him.



ANNEX G

Definition of when to put a boat on restriction

- 1- The hull suffers damage that punctures the inner and outer surface of the hull that sits below the water when a boat is stationary.

Ex.: inside of the tunnel, sponson, chine

- 2- Delaminating occurs on a surface that comes in contact with the water during racing condition (outside edge of sponson, outside rear chine, sponson bottom, bottom of the boat between the break point and the transom)
- 3- Damage occurs to any area of the hull that the skid fin and or rudder is attached to fin bracket, control arm area/bracket, rudder bracket
- 4- Other situation where the inspector, chief referee and a builder agree on.



ANNEX H

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