



# 2024 TAG™ 4 Cycle Clone Rules



## “Stock Clone Claimer Class”

**Stock Engine Rules:** *Important Note: All parts must be Box Stock factory production parts unless otherwise specified in this rules manual. No machining or alteration of parts is allowed unless specifically noted. **Tumbling of engine parts is strictly prohibited.***

**Anything Which Is Not Expressly Allowed Is Forbidden** (All new parts must be sent to TAG-USA for approval)**All parts presented in tech may be compared to a known stock part.**

**Fuel:** gasoline only (ethanol 10% only)

**Tires:** Front 450 x 5 Minimum / Rear 600 x 5 minimum Sprint will utilize CIK Homologated Hard compounds Road race will allow for Open compound.

**Approved Engines:** Lifan, Greyhound, Harbor Freight Blue & Yellow, Jaing Dong, Yamakoyo, Blue Max, Ducar, Dupor, BSP (196 cc ONLY.)

**Clutches:** Any stamped drum clutch allowed. No machined drums allowed. Must be shoe type clutch. No disc clutches will be allowed.

**Fuel tank:** must be floor mounted.

**Carburetor:** Huayi OR RUI\*ING model carb only. Carb to intake sealer is gasket only no other sealer allowed. Choke must be as supplied from factory, but may be fixed to stay in open position. (Choke area must remain as cast). Venturi .615" NO-GO. Venturi may be machined to spec, Minimum Venturi size is .608", no polishing permitted and all transitions must remain stock in and out of venturi. Rear carb bore .751" NO-GO.

Carb bore at rear of carb .750" maximum depth(This measurement is taken from the flat surface on the rear of the carb down to the circular ridge at venturi edge). Main fuel jet .042" NO-GO. No use of loctite or other materials on high speed jets or damaged threads permitted in an attempt to lock jet in a non stock location. Main jet must seat firmly on bottom of E-Tube. Low speed idle jet is a Non Tech (Carb body subject to tech). item. Stock emulsion tube must be used and unaltered, .066' max ID (NO-GO). Side holes in E-Tube 4 holes in bottom section max and must have 20 holes in middle section. Minimum E-Tube length 1.092 (and must be straight)". The minimum protrusion of the e-tube into the Venturi must be check by the newly approved NO GO gauge (.488, .478). Minimum outside diameter of the E-Tube at any point is .154". Side holes in e-tube diameter .036" no go. Throttle shaft - .115" minimum. Stop arm of throttle shaft maybe filed to adjust for butterfly position. Butterfly - .037" minimum thickness. Butterfly screw minimum length .305" , screw must remain stock as produced (must have factor taper. If screw has factored flare, it can be filed on the sides to remove burs from screws). allowed to achieve min length. Aftermarket air filter adapter allowed (max length of 1.375). Phenolic spacer must be flat across entire gasket mating surface, with a minimum thickness on gasket surface of .265" (not including gasket). Gasket surfaces must remain parallel ... no angle cutting allowed. Center inlet hole is NON-TECH (size, configuration, finish), but no rifling, grooving, dimpling, etc. allowed. Maximum mounting hole(s) size .300" NO-GO (checked with .300"+ pin gauge)". Phenolic spacer/gasket(s) subject to spray test to check for leakage or introduction of air into intake track.



**AIR FILTER:** Air filter can not be configured as a ram air induction. Inspect inside air filter for an obstruction of air to pass through filter. Any one piece round body filter, maximum overall length, excluding flange 8 1/4", maximum diameter 6 1/4. Air may only enter from exterior surface of sides of the filter body only. End of filter must be flat with no entrance air from end of filter. Pre filter from foam or nylon allowed. Any additional holes, vents, ports, ect. In the fuel system, carburetor or any other means of air introduced into air flow is strictly prohibited.

**Fuel Pump Requirements:** Fuel pump must be pulsed from either the crank case or the valve cover. (Maximum pulse hose length is 9") You may install a flat metal plate in the original tank location for the purpose of mounting the throttle linkage and fuel pump.

**Engine Block** must remain stock. No machining allowed Maximum bore is 2.685. Stroke is 2.123 --plus ( +.007 ) or minus .005". No piston pop out allowed. Matting surface finish of block and cylinder head is a non-tech item, surfacing of both to correct gasket failure and meet cc check allowed however, no piston pop out is allowed. May use 2 side cover gaskets of stock configuration. (Oil drain hole between lifters .250" max, .251" no go. Any type side cover fastener and lock washer permitted, must be original size, sealer permitted.) Solid dowel pin replacement for the side cover to block .317 maximum diameter allowed (Factory stock dowel pin is 8mm or .315). Dowel pin must remain in the factory position. Block must remain stock as produced. Stub for governor may be removed and hole plugged. No machining of block allowed. Welding to the block shall be for rod damage repair only and may not constitute a functional modification. (No welding above the block on the cylinder fins or on the flywheel side for bracing.)

**Cylinder Head:** OEM head Style only. Valve seats have two angles: single 45\* bottom and single 30\* top angle.

OEM valves with 45\* seat angle only no lighting or polishing Intake seat maximum ID (.899), Exhaust seat maximum ID (.863 1mm minimum on valve margin) Outside face of valve may not be below floor of combustion chamber (i.e. don't sink the valves). Allen head bolts permitted on Header to head. The use of Aftermarket FLANGED bolts of similar OEM design (head size, diameter, length and thread length/pitch) allowed as replacement for stock head bolts. No studs allowed ... No additional washers allowed." Breather hole on valve cover may be tapped with 1/4" pipe tap to accommodate breather fittings, no over size drilling allowed. Head gasket/s maybe after market, must be of stock configuration,. Depth check between the valves, front to back and side to side may not vary by more than .005" max. (Measured from gasket service to the center of valves). No copper or aluminum gaskets allowed. Any stock configuration exhaust gasket allowed, sealer permitted, Header may also be run without gasket, sealer only. Allen head bolts permitted on Header to head. Head gasket must be stock configuration (.009) Minimum Thickness (Measure from the gasket service of the head to the center of the valves. Minimum .275) May wipe carbon of the head before the test. Must use a head gasket minimum .009 thick measured in 4 places between head bolts. ( 0 deck no pop out )( Take tool R2217 and lay on block with piston at TDC tool cannot touch piston while swiping from top to bottom of block.) No peek decking allowed.



**Valve train:** Stock four bolt valve cover only with any stock configuration gasket, sealer allowed. Factory stock rocker arms 1:1 ratio and push rods only. Minimum over-all length of rocker arm 2.145". minimum thickness of the upper valve stem end of rocker arm .030". Surface finish of contact area of rocker arm to valve stem **ONLY**, non tech, to adjust for proper running lift. Square tipped rockers allowed. Stock steel/stainless nitrate coated valves only 45 degree angle only both valves with a minimum weight of 21 grams each, (1mm minimum on valves) Stock valves only 45 degree angle only both valves, Intake valve Max OD .982" +/- .005" and Exhaust valve Max OD .945" +/- .005", no (other) modifications allowed. Single valve springs (10.8) only. (Installed Height for valve springs .815", must be checked by using the .815" spring must go gauge with retainer seal and shims in place on intake an exhaust valve if used.) Shims may be used to achieve .815" Installed height, maximum thickness of shims used .075", any combination of valve seal and spring shims allowed. The ruling on the .075 shim thickness includes the oil seal if used. (Rubber seal may be removed and closed as shim only). The valve stem seal has no tech other than it's thickness combined into the max of .075 to obtain a min of .815 installed spring height. In other words, the valve stem seal can be used or not used and is no longer a tech item unless used as a shim. Also the rubber inside it is a non tech item. Prescribed check procedure as follows – Remove valve spring, reinstall spring retainer and shims, insert (tool fully under retainer) .815" must go gauge in spring location. Gauge must go in both locations Intake and Exhaust with any allowed retainers and shims in place, as raced, during check procedure. Max wire diameter on spring wire is .071" with a maximum tension of 10.8 lbs. at a height of .850", and a maximum tension of 18 lbs at .650". Prescribed procedure for using weight checker is as follows. Spring must slide over post on it's own to the bottom. When weight is placed gently on the spring, push weight down onto spacer so that it bottoms out. Release weight and shine a flashlight between weight and spacer. Light must be visible in it's entirety of 360 degrees to disqualify spring. Add (Additional check for valve springs – Each spring is to be checked using a .750"height by .800"width plate gauge and a .250" (square) no-go gauge to check the center spacing of the spring coils while inserted in the plate gauge.) Prescribed check procedure as follows – Insert the spring in the .750" X .800" plate gauge (spring must be centered (can slide to either side) in plate gauge and must fit inside of gauge with the ends of the spring wires perpendicular to the plate ). Once inserted in the plate gauge take the .250" no-go gage and check the center coil spacing on both sides. The .250" no-go gauge must be parallel to the spring wire and perpendicular to the center of the spring when checking. The .250" no-go must pass check on at least one side of the spring.

This check is to be performed after the 10.8/lb , 18/lb check, and .071 max wire diameter check have been performed. Ends of the valve springs may be sanded to help meet spring checks. Lash cap on exhaust valve only. Valve stem seal allowed on Intake and Exhaust valve. BS lifters only, no modifications allowed. Over-all length of push rod 5.285" max, 5.230" min. Push Rod must be of 3 piece design (Hollow or solid tube with 2 solid ball ends). Lifter Head diameter .915" min with no visible modifications. Weight check lifters 18 grams min and push rods 9 grams min.

**Spark Plug:**14mm X .75 reach only **Stock rod only:** no modifications.

OEM cast rods no modifications. No machining of any type allowed. Stock rod bolts only.

**Stock crankshaft only:** OEM no modifications.

Stock Stroke Length 54mm or 2.126 (+.007 Max stroke 2.133)

Machining, polishing, addition of material or other alteration of crankshaft is prohibited.

Crankshaft journal diameter is 1.180"max - 1.168" min



**Stock piston & rings only.** Piston must be unaltered Box Stock only. Overall piston length 1.935" max, 1.920" min and from top of wrist pin to top of piston .580" max. Arrow on top of piston must be pointed toward valves/lifters. Overall length wrist pin 2.100" min, inside diameter .550" max. Top ring and middle ring .115" max width, .060" max thickness.) Filing of ring end gaps permitted including oil expander, max end gap .040"(top 2 rings only). Lapping of rings permitted for proper seal. Piston ring must be in one piece (unbroken) when presented for tech. Piston rings must be self supporting in cylinder bore and concentric to cylinder bore. Oil ring assembly must be self supporting in cylinder bore when checked installed on piston with connecting rod attached (rod cap and bolts installed are not required for this check). Minimum weight of piston 145 grams (must conform to this spec by 4/15,2015). Honing of wrist pin journals permitted ... bore surface must remain flat and retain stock configuration edges. Skirt of piston must remain as produced ... no chamfering, radiusing or breaking of edges permitted. Up to .010" over pistons allowed (2.691 NO GO)

**Camshaft:** must be stock. Stock camshaft cores only, ez-spin assy must remain as stock. Cam lobe base circle diameter .865" -.005"/+.010" Duration check for Intake and Exhaust lobes (taken off pushrod). Intake duration of 219 degrees at .050 lift/86 degrees at .200 lift.\* Exhaust duration of 222 degrees at .050" lift/97 degrees at .200" lift.\* (\*+2/-5 degrees for wear and gauge variances) Max Intake lift on cam .225" – Min .215"lift taken at the pushrod. Max Intake lift at the valve .238" Taken on valve spring retainer with zero lash. Max Exhaust lift on cam .232" – Min .222" lift taken at the pushrod. Max Exhaust Lift at the valve .242" Taken on valve spring retainer (as run).

**Flywheel and Ignition system:** Stock Box Stock system only and must be unaltered. Spark Plug boot must be the stock black hard plastic boot ONLY! Kill switch and low oil sensor may be disabled and removed. Flywheel: BSFW-1 and DJ-168F-16200-A steel billet flywheels allowed, same weight check as stock flywheel.(5lbs 4oz minimum) including plastic fins.Also allowed the ARC 6619, ARC 6618, Raceseng Flywheels RSP-13-075 Rewheel NF- S1 & RSP-13-077 Rewheel F-S1, PVL 211-900 in the BS classes. Non-fin flywheels must utilize stock plastic fins. No alterations of any type allowed. As of 1/1/2013 stock cast flywheel are no longer allowed. Timing and flywheel key is non-tech.

**Header and Muffler Requirements:** Header Pipe Length: Minimum 18"- Maximum 22". Silencer must be a RLV 91\_L type with .1285 no-go hole. Header must be securely wrapped from flange to muffler prior to the race. Exhaust Pipe must be double nutted or safety wired and silencer must be supported by clamped on brace to secure it in place.

**Blower Housing and Pull starter** must be present and remain stock. You may rotate pull starter for a better angle to crank from.

**Engine oil** recovery system mandatory (oil catch can).

**Oil sensor** may be removed.

**Governor** and governor component is non-tech and may be removed.

**Bearings:** Crankshaft Bearings shall be metallic (Magnetic Steel) construction (Excluding retainers) and be of conventional ball design (9 Ball only)

**Coatings:** Internal performance coating of any type is not allowed.





This will be a **Claiming Class**.

The Claiming rules are as follows.

Only a competitor participating in the same class as the person whose engine they are claiming may place a claim on another competitor's engine.

The Claim must be made prior to the start of the race event by posting a \$225.00 deposit or \$300.00 deposit if the billet STEEL flywheel is included .

The engine being claimed must finish in the top 5 and pass post tech.

A \$25.00 processing fee will be kept by the host club whether or not the claim is executed.

The person placing the Claim must finish the event and pass post tech prior to their engine claim becoming valid.

\$200.00 will be paid to the person whose engine has been claimed only if that person passes post tech.

At that time the engine only will be made available to the person posting the deposit. The engine does not include motor mount, chain guard, muffler, header, air filter assembly, and aftermarket throttle linkage, top plate, fuel pump or Clutch.

Additional rules may be added as the 2019 season progresses rule changes and additions will be posted to the website [www.tagracing.net](http://www.tagracing.net)

Any rule changes approved and posted to the website will be effective from the date of posting

#### **Class structure:**

**4-Cycle Stock Clone Novice:** 225 lbs 7 to 11 years ARC/.550" Blue Restrictor With stock Muffler

**4-Cycle Stock Clone Junior:** 305 lbs 11 to 15 years

**4-Cycle Stock Clone Senior:** 360 lbs.15 years and up

**4-Cycle Stock Clone Masters:** 385 lbs 35 years and up

Important Note: Any attempt to increase the RPM's of the "Stock Clone" Classes, engine(example: stronger/non stock valve springs or decreasing exhaust restriction from stock levels) is strictly prohibited. Should this be allowed or preformed will mandate the use of an aftermarket Billet style flywheel for high RPM use (Super Box).ARC currently has these parts in their product line (part #'s 6618/6619) and they are approved by TAG Racing Int. / TAG USA for use, others may become available as demand increases. Note: Under no circumstances is this type of flywheel allowed in the Box Stock (Stock Classes), Stock Flywheel ONLY. No other alterations to or from stock components are allowed



## "Box Stock Clone"

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**All parts presented in tech may be compared to a known stock part. Fuel:** gasoline only (ethanol 10% only)

**Tires:** Front 450 x 5 Minimum / Rear 600 x 5 minimum Sprint will utilize CIK Homologated Hard compounds Road race will allow for Open compound.

**Approved Engines:** Lifan, Greyhound, Harbor Freight Blue & Yellow, Jaing Dong, Yamakoyo, Blue Max, Ducar, Dupor, BSP (196 cc ONLY.)

**Clutches:** Any stamped drum clutch allowed. No machined drums allowed. Must be shoe type clutch. No disc clutches will be allowed. (Allow new temp or new members to run disc clutches for a period of 3 races, but must switch to a shoe clutches to continue in the series.)

**Fuel tank:** must be floor mounted.

**Carburetor:** Huayi OR RUI\*ING model carb only. Carb to intake sealer is gasket only no other sealer allowed. Choke must be as supplied from factory, but may be fixed to stay in open position. (Choke area must remain as cast). Venturi .615" NO-GO. Venturi may be machined to spec, Minimum Venturi size is .608", no polishing permitted and all transitions must remain stock in and out of venturi. Rear carb bore .751" NO-GO.

Carb bore at rear of carb .750" maximum depth (This measurement is taken from the flat surface on the rear of the carb down to the circular ridge at venturi edge). Main fuel jet .042" NO-GO. No use of loctite or other materials on high speed jets or damaged threads permitted in an attempt to lock jet in a non stock location. Main jet must seat firmly on bottom of E-Tube. Low speed idle jet is a Non Tech (Carb body subject to tech). item. Stock emulsion tube must be used and unaltered, .066" max ID (NO-GO). Side holes in E-Tube 4 holes in bottom section max and must have 20 holes in middle section. Minimum E-Tube length 1.092" (and must be straight). The minimum protrusion of the e-tube into the Venturi must be checked by the newly approved NO GO gauge (.488, .478). Minimum outside diameter of the E-Tube at any point is .154". Side holes in e-tube diameter .036" no go. Throttle shaft - .115" minimum. Stop arm of throttle shaft maybe filed to adjust for butterfly position. Butterfly - .037" minimum thickness. ( must have factory taper on butterfly ) Butterfly screw minimum length .305" , screw must remain stock as produced (must have factory taper. If screw has factory flare, it can be filed on the sides for removal of burrs from screw to perform tech procedure. Aftermarket air filter adapter allowed (max length of 1.375).



## ADDITIONAL CARBURETOR GAUGES EXPLANATION 2024 carb tools

The following gauges are additional to the currently used gauges for inspecting the carburetor.

**Mounting Flange Gauge:** Measures the distance from the e-tube to the mounting flange of the carburetor. Gauge may not touch e-tube.

**Front Air Bleed Gauge:** Measures the size of the air bleeds on the air cleaner end of the carburetor. This is a MUST GO gauge. Measures both left and right bleeds.

**Low speed air bleed Gauge:** Measures the 4 small holes opposite the butterfly. This gauge is a NO GO gauge. Do not apply excessive pressure when using the gauge.

**Venturi Gauge:** ( 2 piece; E-tube gauge and .750 step gauge ) : Gauge is designed for use in the Hauyi; Ruxing; and Tillotson carburetors. Gauge is stepped for different bore sizes. Gauge measures the following:

.750 step distance from e-tube. Place the largest of the two gauges ( .750 step gauge ) in the mounting flange end of the carburetor and seat against the .750 step area.

NOTE: Be sure to use the tightest fitting end. Next place the appropriate end of the of the E-tube gauge in the opposite end of the carburetor and shove firmly against the E-tube.

NOTE: The E-tube gauge has a long slot and a short slot in each end. The long slot is used for this check. If the E-tube gauge pushes the Step Gauge away ( out of the bore ) the carburetor is out of spec. ( illegal )

**E-tube Gauge:** This gauge is used for checking the amount of visible highly machined venture in front of the gauge. The short slot is used for the check. NOTE: Be sure to choose the tightest fit section for the proper carburetor. Slide the gauge in the mounting flange end of the carburetor and shove against the E-tube. Visually inspect the opposite end of the gauge for **highly visible machined venture** in front of the gauge. NOTE: It may be necessary to move the gauge to 12 o'clock or 6 o'clock while holding firmly against the E-tube to allow a visible area to be noticed. If no HIGHLY VISIBLE MACHINED AREA OF THE VENTURE cannot be seen the carburetor is out of spec. ( illegal )

Phenolic spacer must be flat across entire gasket mating surface, with a minimum thickness on gasket surface of .265" (not including gasket). Gasket surfaces must remain parallel ... no angle cutting allowed. Center inlet hole is NON-TECH (size, configuration, finish), but no rifling, grooving, dimpling, etc. allowed. Maximum mounting hole(s) size .300" NO-GO (checked with .300"+ pin gauge)". Phenolic spacer/gasket(s) subject to spray test to check for leakage or introduction of air into intake track. ( restrictor plates must have a gasket on each side of plate, subject to spray test for interdiction of air. No modification allowed to the restrictor plates. Red .375, Green .425, Purple .500, blue .550 )

**AIR FILTER:** Air filter cannot be configured as a ram air induction. Inspect inside air filter for an obstruction of air to pass through filter. Any one piece round body filter, maximum overall length, excluding flange 8 1/4", maximum diameter 6 1/4. Air may only enter from exterior surface of sides of the filter body only. End of filter must be flat with no entrance air from end of filter. Foam or nylon pre-filter allowed. Any additional holes, vents , ports, etc. In the fuel system, carburetor or any other means of air introduced into air flow is strictly prohibited.

**Fuel Pump Requirements:** Fuel pump must be pulsed from either the crank case or the valve cover.(Maximum pulse hose length is 9") You may install a flat metal plate in the original tank location for the purpose of mounting the throttle linkage and fuel pump.



**Engine Block** must remain stock. (Excessive beveling at top of cylinder for the purpose of gasket matching strictly prohibited.) Maximum bore is 2.685. Stroke is 2.123 --plus .010" or minus .005". No piston pop out allowed. Matting surface finish of block and cylinder head is a non-tech item, surfacing of both to correct gasket failure and meet cc check allowed however, no piston pop out is allowed. May use 2 side cover gaskets of stock configuration. (Oil drain hole between lifters .250" max, .251" no go. Any type side cover fastener and lock washer permitted, must be original size, sealer permitted.) Solid dowel pin replacement for the side cover to block .317 maximum diameter allowed (Factory stock dowel pin is 8mm or .315). Dowel pin must remain in the factory position. Stub for governor may be removed and hole plugged. Welding to the block shall be for rod damage repair only and may not constitute a functional modification. No welding on fins of the block or flywheel side for bracing.

**Cylinder Head:** OEM head (JT, TG1 or the Tag USA SRE/GAGE head ) Valve seats may have three angles: ( 30\*, 45\* , 60\* )(Must not touch the guides or seats in the porting process, guides must be in original location)  
OEM valves with 45\* seat angle only no lighting or polishing Intake seat maximum ID .897", Exhaust seat maximum ID (.863.) (1mm minimum margin on valve.) Outside face of valve may not be below floor of combustion chamber (i.e. don't sink the valves). Allen head bolts permitted on Header to head. The use of Aftermarket FLANGED bolts of similar OEM design (head size, diameter, length and thread length/pitch) allowed as replacement for tech valve cover may be tapped with 1/4" pipe tap to accommodate breather fittings, no over size drilling allowed. Head gasket/s maybe after market, must be of stock configuration, gasket thickness is a tech item. Depth check between the valves, front to back and side to side may not vary by more than .005" max. (Measure from gasket service to the center of valves). No copper or aluminum gaskets allowed sealer permitted. sealer permitted. Header may also be used sealer without gasket, sealer only. Allen head bolts permitted on Header to head. (Must be wired or double nutted) Head gasket must be stock configuration.(.009) Minimum Thickness

**Combustion Chamber** (Measure from the gasket service of the head to the center of the valves. Minimum .275 depth. May wipe carbon of the head before the test. Must use a head gasket minimum .009 thick measured in 4 places between head bolts. (0 deck no pop out ) (Take tool R2217 and lay on block with piston at TDC tool cannot touch piston while swiping from top to bottom of block.) No peek decking allowed.

**Valve train:** Stock four bolt valve cover only with any stock configuration gasket, sealer allowed. Factory stock rocker arms 1:1 ratio and push rods only. Minimum over-all length of rocker arm 2.145". minimum thickness of the upper valve stem end of rocker arm .030". Surface finish of contact area of rocker arm to valve stem only, non tech, to adjust for proper running lift. Square tipped rockers allowed. Stock steel/stainless nitrate coated valves only 45 degree angle only both valves with a minimum weight of 21 grams each, (1mm margin minimum on valves, no knife edging of the intake or exhaust valves) Stock valves only 45 degree angle only both valves, Intake valve Max OD .982" +/- .005" and Exhaust valve Max OD .945" +/- .005", no (other) modifications allowed. Single valve springs (10.8 lb) only. (Installed Height for valve springs .815", must be checked by using the .815" spring must go gauge( between the )retainer seal and shims in place on intake an exhaust valve if used.) Shims may be used to achieve .815" Installed height, maximum thickness of shims used .075", any combination of valve seal and spring shims allowed. The ruling on the .075 shim thickness includes the oil seal if used. (Rubber seal may be removed and used as shim only). The valve stem seal has no tech other than it's thickness combined into the max of .075 to obtain a min of .815 installed spring height. In other words, the valve stem seal can be used or not used and is no longer a tech item unless used as a shim. Also the rubber inside it is a non tech item. Prescribed check procedure as follows – Remove valve spring, reinstall spring retainer and shims, insert (tool fully under retainer) .815" must go gauge in spring location. Gauge must go in both locations Intake and Exhaust with any





allowed retainers and shims in place, as raced, during check procedure. Max wire diameter on spring wire is .071" with a maximum tension of 10.8 lbs. at a height of .850", and a maximum tension of 18 lbs at .650". Prescribed procedure for using weight checker is as follows. Spring must slide over post on it's own to the bottom. When weight is placed gently on the spring, push weight down onto spacer so that it bottoms out. Release weight and shine a flashlight between weight and spacer. Light must be visible in it's entirety of 360 degrees to disqualify spring. (Additional check for valve springs ) Each spring is to be checked using a .750"height by .800"width plate gauge and a .250" (square) no-go gauge to check the center spacing of the spring coils while inserted in the plate gauge.) Prescribed check procedure as follows – Insert the spring in the .750" X .800" plate gauge (spring can slide to either side) in plate gauge and must fit inside of gauge with the ends of the spring wires perpendicular to the plate ). Once inserted in the plate gauge take the .250" no-go gage and check the center coil spacing on both sides. The .250" no-go gauge must be parallel to the spring wire and perpendicular to the center of the spring when checking. The .250 pin can only pass through one side of the spring. If it will not pass through either side it is deemed legal)

This check is to be performed after the 10.8/lb , 18/lb check, and .071 max wire diameter check have been performed. Ends of the valve springs may be sanded to help meet spring checks. Lash cap on exhaust valve only. Valve stem seal allowed on Intake and Exhaust valve. BS lifters only, no modifications allowed. Over-all length of push rod 5.285" max, 5.230" min. Push Rod must be of 3 piece design (Hollow or solid tube with 2 solid ball ends). Lifter Head diameter .915" min (may grind bottom of lifer but must meet min wt of 18 grams ). Weight check push rods 9 grams min.

**Spark Plug:** 14mm X .75 reach only After market plugs allowed

**Stock rod only:** OEM cast rods. Stock rod bolts only. (May hone rod journal and risk pins for proper clearance only new performance rod allowed no bullet rods )

**Stock crankshaft only:** OEM no modifications.

Stock Stroke Length 54mm or 2.126 (+.007 or minus .005) ( Max stroke 2.133)  
Machining, polishing, addition of material or other alteration of crankshaft is prohibited.  
Crankshaft journal diameter is 1.180"max - 1.168" min

**Stock piston & rings only.** Piston must be unaltered Box Stock only. Overall piston length 1.935" max, 1.920" min and from top of wrist pin to top of piston .580" max. Arrow on top of piston must be pointed toward valves/lifters. Overall length wrist pin 2.100" min, inside diameter .550" max. Top ring and middle ring .115" max width, .060" max thickness.(1 mm rings allowed ) Filing of ring end gaps permitted including oil expander, max end gap .040"(top 2 rings only). Lapping of rings permitted for proper seal. Piston ring must be in one piece (unbroken) when presented for tech. Piston rings must be self supporting in cylinder bore and concentric to cylinder bore. Oil ring assembly must be self supporting in cylinder bore when checked installed on piston with connecting rod attached (rod cap and bolts installed are not required for this check). Minimum weight of piston 145 grams.( must include oil scrap rings while performing this test ) Honing of wrist pin journals permitted ... bore surface must remain flat and retain stock configuration edges. Skirt of piston must remain as produced ... no chamfering, radiusing or breaking of edges permitted. Up to .010" over pistons allowed (2.691 NO GO)

**Camshaft:** must be stock. Stock camshaft cores only, ez-spin assy must remain as stock. Cam lobe base circle diameter .865" -.005"/+.010" Duration check for Intake and Exhaust lobes (taken off pushrod). Intake duration of 219 degrees at .050 lift/86 degrees at .200 lift.\* Exhaust duration of 222 degrees at .050" lift/97 degrees at .200" lift.\* (\*+2/-5 degrees for wear and gauge variances) Max Intake lift on cam .225" – Min .215"lift taken at the pushrod. Max Intake lift at the valve .238" Taken on valve spring retainer. Max Exhaust



lift on cam .232" – Min .222" lift taken at the pushrod. Max Exhaust Lift at the valve .242"  
Taken on valve spring retainer as run.

**Flywheel and Ignition system:** Stock Box Stock system only and must be unaltered. Spark Plug boot must be the stock black hard plastic boot ONLY! Kill switch and low oil sensor may be disabled and removed. Flywheel: BSFW-1 and DJ-168F-16200-A steel billet flywheels allowed, same weight check as stock flywheel.(5lbs 4oz minimum) including plastic fins.Also allowed the ARC 6619, ARC 6618, Raceseng Flywheels RSP-13-075 Rewheel NF- S1 & RSP-13-077 Rewheel F-S1, PVL 211-900 in the BS classes. Non-fin flywheels must utilize stock plastic fins. No alterations of any type allowed. As of 1/1/2013 stock cast flywheel are no longer allowed. Timing and flywheel key is non-tech.

**Spark Plug boot** Stock Box Stock system only and must be unaltered. (must be the stock black hard plastic boot ONLY resistor or non resistor)! Kill switch and low oil sensor may be disabled and removed. Flywheel: BSFW-1 and DJ-168F-16200-A steel billet flywheels allowed, same weight check as stock flywheel.(5lbs 4oz minimum) including plastic fins .Also allowed the ARC 6619, ARC 6618, Raceseng Flywheels RSP-13-075 Revwheel NF- S1 & RSP-13-077 Revwheel F-S1, PVL 211-900 in the BS classes ( minimum wt 3.3 lbs.) Non-fin flywheels must utilize stock plastic fins. No alterations of any type allowed. As of 1/1/2013 stock cast flywheel are no longer allowed. Timing and flywheel key is non-tech.

**Header and Muffler Requirements:** Header Pipe Length: Minimum 18"- Maximum 22". Silencer must be a RLV 91\_L type with .1285 no-go hole. Header must be securely wrapped from flange to muffler prior to the race. Exhaust Pipe must be double nutted or safety wired and silencer must be supported by clamped on brace to secure it in place.

**Blower Housing and Pull starter** must be present and remain stock. You may rotate pull starter for a better angle to crank from.

**Engine oil** recovery system mandatory (oil catch can).

**Oil sensor** may be removed.

**Governor** and governor component is non-tech and may be removed.

**Bearings:** Crankshaft Bearings shall be metallic (Magnetic Steel) construction (Excluding retainers) and be of conventional ball design (9 Ball only)( bearings may slip fit in block and side cover. )

**Coatings:** Internal performance coating of any type is not allowed.

**Class structure:**

**4-Cycle Box Stock Clone Novice:** 225 lbs 7 to 11 years ARC/.550" Blue Restrictor With stock Muffler

**4-Cycle Box Stock Clone Junior:** 305 lbs 11 to 15 years

**4-Cycle Box Stock Clone Senior:** 360 lbs.15 years and up

**4-Cycle Box Stock Clone Masters:** 385 lbs 35 years and up



## ENGINE SPEC SHEET FOR Builder's 6.5 OHV CLASS

**Builder's 6.5 OHV** – Fuel Methanol ONLY – Approved Engine: 6.5 OHV 196cc clone engine

modified only according to BP OHV Engine Spec.

**Description:** Single cylinder, 2-valve overhead 4-cycle engine. No aftermarket coatings of any type are permitted on any part of the engine (exception Blower Housing and Shrouds).

**Cylinder Head Requirements:** Stock cylinder (TAG-USA 1 Gage-1 SRE approved). Machining of gasket surface is allowed. No addition of material in ports or to cylinder head allowed. Porting and / or grinding are not permitted. Valve seats may have two angles, 45° valve face and 30° top relief. Inside diameter of valve seats must be stock (Into.899)" max ID and Ex .863)" max No GO Gage). Stock head bolts are required and all four are required. Head gasket/s maybe after market, must be of stock configuration, and gasket thickness Depth check between the valves, front to back and side to side may not vary by more than .005" max. Cylinder head guide plate f or pushrods must remain stock. No other alterations to the stock head are permitted. (Champion 1:1 Rockers allowed in May)

**Bore and Stroke:** Stock bore is 2.685" and may be over bored to 2.718" Stroke is 2.123" +.010"-.005".

Connecting Rod: Stock or Billet aluminum rods, with or without bearing inserts allowed. No titanium rods allowed. Rod length is a non tech item.

**Combustion Chamber Volume:** 25 cubic centimeter minimum, with piston at TDC, using prescribed procedure. The Liquid CC check is the official check (IF THE ENGINE FAILS THE CC LIQUID CHECK AT ANY TIME DURING THE TECH PROCEDURE IT MUST BE CALLED ILLEGAL).

**Carburetor/Intake Requirements:** Stock Huayi or RUI\*ING carb. Venturi .625" NO-GO. Rear carb bore .751" NO-GO. Carb bore finish, non tech. Throttle shaft - .115" minimum. Butterfly - .037" minimum. Air Filter adapter of 1.375" max length allowed. No air rams. Pulse-type fuel pump is mandatory. Fuel pump must be pulsed from either the crankcase or the valve cover. Black phenolic carb insulator must be used. Choke assembly may be removed. Jets, air bleeds jets, and emulsion tubes are non-tech. Throttle shaft, washer, and butterfly must be stock and must be present, butterfly screw non tech. Stock intake runner gasket configuration only. One extra gasket may be used with restrictor plates. No other alterations are permitted.

**Ignition system:** Ignition timing is non tech. Stock ignition module only. No modifications of any type allowed. Sparkplug connector must be stock as from factory.

**Piston Requirements:** Must be stock dished piston with no modifications. Oversize Clone or Honda ZOT dished piston is allowed up to .035" oversize. Rings must appear stock and all rings must be installed. Piston may not pop out above cylinder deck.

**Valve Train:** Stock valve-train only in stock configuration except any single valve springs and valve spring shims are allowed. No additional support for rocker studs permitted. Valves must be one angle only, 45°. No polishing, lightening or knife edging of valves (1mm min. margin). Valve length is non-tech. Outside face of valve head may not be below the combustion chamber floor. (i.e. don't sink the valves) Valve cover may be drilled for fuel pump pulse fitting, otherwise, it must remain unaltered. Valve cover gasket is non-tech.



**Camshaft Requirements:** Stock camshaft cores only, ez-spin assy must remain as stock. Duration check for Intake and Exhaust lobes (taken off pushrod) . Intake duration of 248 degrees at .050 lift/107 degrees at .200 lift. Exhaust duration of 247 degrees at .050 lift/116 degrees at .200 lift. Max lift at the valve retainers, Intake .238" and exhaust .242" taken on valve spring retainer with zero lash. (To achieve zero valve lash for checking running lift, preload dial indicator by .001".)

**Crankshaft Requirements:** Stock, factory crankshaft only with stock, factory timing gear in factory location. No modifications to crankshaft allowed. Aftermarket steel main bearings of non self-aligning type, with or without seal are allowed. No ceramic bearings. Crankshaft Journal diameter is 1.180", 1.168" minimum.

**Block Requirements:** Stock Block, as cast and produced with no alterations or modifications other than those specifically permitted. Block head mating surface may be machined, however, no piston pop out is allowed. Blocks may NOT be welded for repairs. No addition of material to block (i.e. welding, jb weld, etc). All bolt bosses in block may be drilled and tapped for repairs or other uses. Additional side cover gaskets as required for crankshaft thrust are permitted. All parts associated with the governor and the low oil sensor may be removed, plugging any associated holes.

**Flywheel:** Approved SFI certified billet aluminum flywheel only. No machining or alteration of any kind allowed. Minimum weight for flywheel is 3.3 lbs. Any timing key or no key at all may be used. A flat washer or spacer may be used, and is recommended, between the flywheel and the nut. Handheld electric starter may be used, but compression release mechanism must remain on camshaft.

Current Approved flywheels: ARC 6619, ARC 6618, Raceseng Flywheels RSP-13-075 Rewheel NF- S1 & RSP-13-077 Rewheel F-S1.

**Header and Muffler Requirements:** Header Pipe Length: Minimum 18"- Maximum 22". Silencer must be a RLV 91\_L type with .1285 no-go hole. Header must be securely wrapped from flange to muffler prior to the race. Exhaust Pipe must be double nutted or safety wired and silencer must be supported by clamped on brace to secure it in place.

## ENGINE SPECIFIC TECH SHEET FOR: STOCK APPEARING 6.5 OVH

**Description:** Single cylinder, 2-valve overhead 4-cycle engine. Fuel - Methanol Only - The engine, unless otherwise noted, must appear like a BSP, or Harbor Freight 6.5 HP engine. Parts may be interchanged between engines. Internally, you can change whatever you want as long as it meets the restrictions below. The restrictions are only for cost control by restricting some expensive machining options, expensive billet parts, and containing performance to levels with reasonable durability expectations.

**Cylinder Head Requirements:** Stock cylinder head only. Machining of gasket surface allowed. Porting allowed, and no addition of material in ports or to cylinder head allowed. Stock Head Bolts are required and all four are required. Must use stock configuration head gasket, thickness non tech. Cylinder head guide plate for pushrods must appear stock.

**Bore and Stroke:** Stock bore is 2.685" and may be over bored to 2.745" (approximately .060" overbore). Stroke is 2.133" max taken from top piston

**Combustion Chamber Volume:** Non Tech.





**Carburetor Requirements:** Stock Appearing Huayi or RUI\*ING carb. Air Filter adapter of 1.375" max length allowed, Air filter may be up to 8" long. Floor pan mounted fuel tank required (stock tank to be removed) and pulse-type fuel pump allowed. Fuel pump must be pulsed from either the crankcase or the valve cover. Black phenolic carb insulator must be used. No epoxy on carb exterior. Choke assembly may be removed, if removed, choke shaft hole must be plugged. Jets, tubes and orifices are non-tech. Any throttle mechanism allowed that works with the stock throttle shaft's bell crank. Remaining stock throttle mechanism parts may be removed. A plate may be bolted to the top of the engine to mount fuel pumps and/or throttle mechanisms.

**Valve Train:** Rockers, ball adjusters, rocker arm studs, lock nuts, pushrods, and lifters must appear stock. No additional support for rocker studs permitted. Any single valve springs allowed. Valves and retainers may be used in any combination on either side. (Example: Exhaust valve, retainer and lash cap may be used on intake side). Valve head diameters must be between .940" and .990".

**Camshaft Requirements:** Max lift of .285" taken with zero valve lash directly off valve retainer. **Ignition system:** Box Stock ignition module only. No modifications of any type allowed.

Sparkplug connector must be stock as from factory.

**Piston Requirements:** Oversized Piston must be flat top or dished. Honda OEM dished (ZOT) pistons or Box Stock Project pistons may be used. Piston CAN NOT ALLOW FOR ANY POP OUT!

**Connecting Rod:** Billet aluminum rods, with or without bearing inserts allowed. No Titanium rods allowed. Rod length is a non tech item.

**Crankshaft Requirements:** Stock, factory crankshaft only with stock, factory timing gear in factory location. Timing gear may be tack-welded to crankshaft in 2 places to avoid slippage. No modifications to crankshaft allowed. Aftermarket main bearings of non self-aligning type, with or without seal, allowed. (No ceramic bearings). Crankshaft Journal diameter is 1.180", 1.175" minimum.

**Block Requirements:** Stock Block, as cast and produced with no alterations or modifications other than those specifically permitted. Block head mating surface may be machined, however, no piston pop out is allowed. Blocks may be welded for repairs as long as the repair does not constitute a functional modification to the block. No welding to block from cooling fins upward to deck surface. Governor stub hole may be tapped and plugged. All bolt bosses in block may be drilled and tapped for repairs or other uses. Additional side cover gaskets as required for crankshaft thrust are permitted. No welding or addition of material (such as epoxy) of any kind to the head, side cover, or block.

**Flywheel:** SFI certified flywheel with cooling fins only (mandatory) with no machining or alteration of any kind allowed. Minimum weight for flywheel is 3.3 lbs. Any timing key or no key at all may be used. A flat washer may be used, and is recommended, between the flywheel and the nut. Pull starter may be replaced with a flywheel cover and any electric starter nut may be employed.

**Header and Muffler Requirements:** Any header is allowed. No muffler unless required by track. If required use RLV-4106. Header may be bent in any configuration to keep it away from the driver and so the muffler will not extend past the rear bumper. Header must be securely wrapped from flange to swedge prior to the race. Exhaust Pipe must be double nutted or safety wired and silencer must be supported by clamped on brace to secure it in place.



# "Predator Box Stock"

Predator hemi or non hemi 212 cc engines. Run as produced out of the box. NO Modifications unless otherwise specified in the rules. This is an out of the box class. No interchanging of parts.

**Fuel:** 87 octane

**Tank:** Must be run as produced from factory.

**Muffler:** Run as produced. Spark arrestors must be in place.

**Governors:** Must be intact and functional. Preset to 5000 rpm ADULTS / JR'S 3500 rpm checks will be performed by any digaton or Micron tacks mounted on the kart. The tack on the kart will be used to determine the max rpm of the engine. If the kart does not have a tack the tech official will provide one to test the RPM. The test will be performed with the kart on a stand, from the foot throttle being pushed full throttle to determine max rpm.)

**Breather box:** Run as produced, filter or foam allowed. No extra holes allowed. Vent hoses must be in tacked.

**Clutches:** Shoes clutches only. Tooth and gears to be determined by track officials.

**Carburetor:** SP carburetors Hemi only. Main jet .031max, no other modifications allowed. All gaskets must be factory and present. (non hemi has Ruxing, Huayi and SP carburetors. )

**Phenolic insulator:** Stock only

**Oil sensor:** May be disconnected, but must be present.

**Blower cover:** must be stock. No aftermarket stickers or taped up pull starters.

**Flywheel:** Stock cast as produced from factory. Plastic fan no alteration. Stock timing key.

**Coil:** Factory coil only. Minimum air gap .020 no alteration to the screws or coil body.

**Timing key:** Stock no alterations

**Cam:** Must be stock cast with compression relief. Lift to be checked with tool P2000 and tool C20012 with 1" indicator. Max lift .245 both intake and exhaust.

**Cam profile:**

Max lift .245

Intake

.050 open 10\* @ ATDC

.050 close 35\* @ ABDC

total 205\*

Exhaust .245

.200 open 77\* @ ATDC

.200 close 31\* @ BBDC

total 72\*



**Note:** These checks will only be preformed if the track tech suspect it is non compliant to spec parts, or a protest is submitted.

**Head:** Run as produce. No alterations. No swapping of parts.

**Block:** Stock no alterations. Flat top piston Hemi, Dished piston Non Hemi

**Bore:** Stock 70 mm or 2.756 "

**Stroke:** Stock 56mm or 2.204"

**Claimer rules:**

- 1: 150.00 engine buy out no clutch, chain guard or throttle assembly.
- 2: 50.00 and engine exchange no clutch, chain guard or throttle assembly.

Competitor must be on the lead lap and claim the engine while in the tech area.

**Option:** Buy a new engine bring to the track unopened. It will be numbered. The drivers will draw a number and that is the motor they will run that night. They can opt to leave the engine at the track to be raced next race.



## Formula-OHV Quick Reference Guide



Approved, commercially available, single cylinder air-cooled overhead valve engines. 210 cc's maximum displacement.

- Block, cylinder head, crankshaft and side cover to be approved OEM items.
- Carburetor: Any commercially available Tillotson HL series carb. Maximum venturi diameter = .790". Metering holes non-tech. Filter cups, adapters and air filters non-tech items. Pulse type fuel pumps permitted.
- Intake manifold: Aluminum only. Maximum inlet tract length of 2". (See note 2)
- Connecting Rods: Aluminum only. (Fasteners and inserts/bushings excluded) Stock length (plus or minus .005") to be maintained. See chart for specific details.
- Pistons: Any aluminum three ring, flat top piston. Rings and wrist pin non-tech except OEM wrist pin diameter to be maintained. See chart for maximum bore size and wrist diameter for a specific engine.

(STROKE #) Crankshaft: Standard OEM item with stock stroke length (plus or minus .010"). Thermal treating (+.008/-003) and shot peening permitted. No other alterations allowed. See list for specific stroke details.

- Flywheel and ignition coil: Aftermarket or OEM flywheels permitted. If OEM flywheel is used it must be unaltered and meet minimum listed weight and stock OEM coil (ignition system) must be used. Approved aftermarket flywheels only may be used. Spec diameter and weight as follows; 6.75" +/- .05" dia. X 5.00 lbs (After market weight) +/- .25 lbs. When using aftermarket flywheels, any approved OEM F200 coil may be used on any engine. (i.e. Briggs coil on a Honda, Tecumseh coil on a Kohler, etc) Coil mounts, flywheel key, spark plug boots and plug wires are non tech items.
- Cylinder head: Original factory casting only. Two valves maximum and must maintain original location, (listed spacing and angles). Porting and grinding permitted. No external addition of metal to enhance performance allowed. Stock spark plug size and location to be maintained. Minimum combustion chamber volume when mounted on engine using prescribed procedure (See note 1). This is to be done after the event and when the engine has cooled down to a reasonable temperature.

(CHAMPION ROCKERS) Valve Train: Steel valves only. No titanium components allowed. Intake 1.080" maximum, exhaust is .990" (Ambient Temperature) maximum. Stock OEM rocker arms and rocker plates only. Rocker arms may be welded or reinforced for strength. No other alterations to original configuration permitted. Flat tappets only, must be stock appearing. Push rods, retainers, springs, keepers, rocker adjusters, etc, (TECHABLE)

- Camshaft: Maximum (actual) lift .275" measured at valve. Cam and crank gear non-tech. This is to be done after the event and when the engine has cooled down to a reasonable temperature.





- **Cylinder head and block external surface may be machined to remove extra material from mounting bosses, cast in brackets, etc that are no longer in use. No external machining allowed to enhance performance.**
- **Fuel: Commercially available non-ethanol pump gas. Test method to be Digitron set at -75 in cyclohexane. Fuel must read zero or below on meter. For major events it is recommended to use a spec fuel. Use the supplied fuel as a standard to “zero” the meter. Tolerance to be +/- 5 points.**
- **Fasteners: Non-tech, but must remain in original location. Heli-coils, studs, etc allowed.**
- **Gaskets. Non-tech.**
- **Lubrication system. Must retain splash type oiling system.**
- **Exhaust system. Non-tech except must run an TAG approved silencer/muffler. (See note 3) (NOGO .1285 :985)**

**Notes**

1. **It is recommended to use ATF (automatic Transmission fluid) diluted 20%/30% with mineral spirits to help eliminate air entrapment during the procedure on OHV engines. Length determined by adding the longest and shortest tract distance (flange to flange) together and dividing by 2.**

Make	Briggs	Honda	Kohler	Tecumseh	Notes
Model	Intek 5.5 (*)	GX200	C6 XKE	OHH 5.5	(*) Note– Animal (Intek 6.5) block, head and side cover OK.
Bore	2.688	2.679	2.638	2.797	Standard Bore
Bore Max.	2.760 (+.072)	2.709 (+.030)	2.783 (+.145)	2.833 (+.036)	Maximum allowed
Stroke	2.040	2.125	2.008	1.938	Standard Stroke +/- .010
Rod length	3.375	3.303	3.425	3.484	Cntr to Cntr. Tolerance is +/- .005
Rod length	2.514	2.358	2.540	2.703	Inside length (including insert if applicable)
Wrist pin dia.	0.625	0.708	0.551	0.563	Tolerance is +/- .0025
Rod journal	1.098	1.180	1.218	0.999	Tolerance is +/- .0025
Flywheel	5.50 lbs	5.50 lbs	7.75 lbs	6.75 lbs	Minimum Weight for OEM Unit
Valve spacing	1.382	1.219	1.380	1.250	Valve angles are 90 deg from deck

