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## **Section 1.0 Introduction to Engine Rules 2010**

- .1 The following section lists the general type of engine to be used for all Microd, Open Wheel and Classic classes. For specific information on the allowed modifications and detailed engine requirements for each class refer to the appropriate section.
- .2 **Please Note, If a modification from stock is not specifically allowed in the Engine Rules it will be considered not allowable. If you have any questions, contact your Tech. Inspector before performing any modification not specifically mentioned.**

## **Section 2.0 Engine Types**

- .1 All engines must conform to the following guidelines listed by class.

<b>Jr. Novice &amp; Novice Microd &amp; Open Wheel</b>	Briggs 5 HP 12.97 CI Max Briggs Animal 14.64 CI Max	<b>Briggs 5 HP, Briggs Animal 6.5 HP</b>
<b>Limited Microd &amp; Open Wheel</b>	<b>12.97 Cubic inches Maximun</b>	<b>Briggs 5 HP</b>
<b>Stock Super Stock Microd &amp; Open Wheel</b>	<b>12.97 Cubic inches Maximun</b>	<b>Briggs 5 HP</b>
<b>Mod Open Wheel</b>	<b>14.55 Cubic Inches Maximun</b>	<b>Briggs 5 HP</b>
<b>Novice Classic MR1 Classic MR2 Classic</b>	<b>N/A</b>	<b>Tecumseh H30 Only – Club motors – Newer Small Valve motors</b>

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## **Section 3.0 Fuel/Oil Requirements 2010**

- .1 The only fuel allowed is commercial automotive and racing gasoline. It must be commercially available to anyone for purchase. Gasohol is not allowed except in the Mod. Open Wheel class.
- .2 No performance enhancement additives may be used (No Nitro type additives in either gas or methanol).
- .3 Fuel will be checked by Specific Gravity reading of 790 or less and a Fuel Meter reading of less than "0", **with the meter zeroed at -55 with C6H12**  
**Note: Most unleaded commercial automotive pump gas will Not pass these tests! Have your fuel checked. Stock classes do not require hi-test fuel and there is no performance gain from hi-test fuel in these classes.**
- .4 Optional Fuel Test to be used along with the Fuel Meter test (at the discretion of the inspection team)
  - 1) Pour 5 ml water, 10 ml Methanol, 10 ml sample fuel into a graduated cylinder;
  - 2) turn cylinder over, then upright. Let mixture settle;
  - 3) When mixture has separated, there must be exactly 10 ml of the fuel sample.
- .5 Engine lubricating oil is subject to test for oxygen-bearing and/or vapor-producing substances which are strictly prohibited. **NYSMA reserves the right to conduct oil sampling tests at any time and by any method.** Among approved methods may be utilization of various oil sniffers, including; Robinair Model 14970, set on low range (unit is no longer manufactured or repaired); TIF Instruments Model 5500 of Snap-On Tools Model ACT 5600.

## **Section 4.0 Engine Modification and Specification Guidelines 2010**

### **Section 4.1**

#### **5 HP Flathead Motor**

#### **Jr Novice, Novice, Limited, Stock & Super Stock, Microd, Jr. Novice, Novice, Stock, Super Stock Open Wheel**

- .1 **Briggs Flathead 5 HP Motor**
  - .1 **Motor:** Briggs 5 hp motor must be used, this motor comes in many variations, it is recommended that the model with a cast iron sleeve and ball bearing side cover be used Briggs Motor Sport motor 133230A is recommended, Briggs Raptor 2 or 3 may be used. New Briggs "Godzilla" block motors are not allowed. **Note: Newer Briggs motors will be evaluated when introduced check with your tech. inspector prior to use.**
  - .2 **Modification**
    - .1 **Any modifications not mentioned in these rules are not allowed.**
    - .2 All forms of engine governing can be removed, this includes all external linkages and springs connected to the carburetor. The plastic governor gear inside the motor should be removed.
  - .3 **Engine Block;**
    - .1 **Cylinder Bore:** Boring is allowed and engine may use up to the +.035 oversized piston. Engines may be re-sleeved. New motors need not be rebored there is insignificant performance gain in reboring motors. Bore specification 5 h.p. 2.562 in. to 2.596 in. +.010 for cylinder wall clearance
    - .2 **Deck:** Piston protrusion is a Non-Tech Item. The deck of the block can be milled to achieve the desired piston protrusion or to remove warpage, no multiple angles. A piston protrusion of .012 to .025 may yield improved performance in this class.

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## **Section 4.1 5 HP Briggs Classes etc. 2010 (continued)**

- .3 Ports:** Intake and Exhaust Ports, Ports are a tech item. Intake port is subject to .880 in. No-Go gauge check. Exhaust Port is subject to 1.005 in. No-Go gauge check. **NO ADDITION OF MATERIAL ALLOWED.** Block may not be machined on intake or exhaust port surfaces. NO GRINDING is allowed on the underside of valve seat. No pin-punching of port allowed. Allen bolts may be utilized to attach carburetor and/or exhaust pipe assembly. Studs allowed for exhaust attachment. In this class removal of flashing and rough edges within the port is highly recommended. Additional grinding will be helpful and offer a performance gain care should be taken not to enlarge ports beyond spec. Removal of the bump at the base of the valve stem along with excess material on the sides of the port and at any low pressure point will be helpful.  
**Excessive grinding in the ports of a restrictor plate motor may reduce power.**
- .4 Valve Seats:** Angle on valve seats optional. It is recommended that the valve seat be cut with two angles minimum. The valve should then be lapped to create the proper seal. The ID of the valve seat can not be modified or enlarged, Intake seat will be checked with a 1.004 in. no go gauge, Exhaust seat will be checked with a .880 in. no go gauge.
- .5 Valve Guides:** Can be replaced with either stock replacement or custom machined parts. Machined parts must be stock shape and size. Replacement valve guides must be installed so that the valve remains in its stock location. The valve guides in a new motor will not need replacement until they have worn to an unacceptable level in this class wear will most likely be seen on the exhaust side first. Machining a flat surface (spot face) in the block on the bottom side of the valve guide is allowable. Block can be repaired by welding in broken area of lifter or valve guide, the position and angle of both the lifters and valve must remain stock, **chamfering the bottom of the lifter bore for clearance is acceptable @ 45 degrees and .500 maximum dia.** (No additional material or repair is allowed in port area)
- .4 Wrist Pins**
- .1** Stock only, no modifications. Max. inside dia. .295 ID
- .5 Cylinder Head**
- .1 Cylinder Head:** Stock head can not be modified, must be OEM stock 5hp heads no 4hp heads allowed, except for the following; ( head will be removed and examined) Planing and /or sanding to remove warpage is allowed, but relieving for valves or piston or any other modifications will not be allowed. Valve pocket spec. is .280 in. Minimum from the head gasket surface to the valve pocket area of the head. Cast flat area is the valve pocket area.
- .6 Crankshaft/Crankshaft Gear**
- .1 Crankshaft:** Stock OEM crankshaft must be used no after market forged cranks allowed, crankshaft will be removed and examined. The only modifications allowed are; the machining of the end of the crank to accept a ball bearing side cover or different size clutch or turning down the crankshaft journal for an insert in the Rod. Maximum Stroke is 2.437 +/- .010 in. for wear, if stroke is over the maximum, the crank will be removed for evaluation by the inspection team.
- .2 Crankshaft gear:** Position is a non-tech item. Note in this class there are aftermarket crankshaft gears that can advance or retard valve timing. Each motor and track is different the optimum position must be determined through actual track testing. It is recommended that any changes be made in very small increments and that the valve timing be checked after any change to assure that the valve timing is still in spec.
- .7 Connecting Rod**
- .1 Connecting rod:** The stock rod may be replaced with a heavy duty racing rod. Rod inserts are legal, roller or needle bearings are not allowed. The oil dipper may be modified. Rod length must be 3.8733 +/- .015 center to center. In this class racing rods are purchased from after market manufacturers. There will not be a performance gain in this class with the use of a racing rod it is recommended though to improve durability.

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## **Section 4.1 5 HP Briggs Classes, etc. 2010 (continued)**

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### **.8 Piston**

- .1 **Piston:** Stock OEM no modifications or Wiseco 1992 or 1993 series or Burris chromed or unchromed. The top of piston must remain flat, can be cut or sanded to achieve the desired piston protrusion.

### **.9 Piston Rings**

- .1 **Piston rings:** Are to be stock or stock replacement. Oil relief grooves, Filing non-stock rings, or any modifications will not be allowed. All 3 rings must be used and No-gap rings are not allowed. It is recommended that a new motor be broken in, then the cylinder honed and new rings installed. .010 Oversized rings can be used to achieve the desired ring end gap. For this class a ring end gap of .006 in. on the top ring and .010 in. on the second ring is recommended.

### **.10 Valves and Valve Springs/Keepers**

- .1 **Intake valve** diameter 1.135 max. 1.115 min. ( must be stock OEM for this motor )  
**Exhaust valve** diameter 1.010 max. .990 min., ( must be stock OEM for this motor )  
Intake valves to have only one angle of 30 or 45 degrees, Exhaust valve to have only one angle of 45 degrees (with no back angles). Margin on valves is a non-tech item. Tappet clearance (valve lash) and length of valves optional due to the grinding of ends for clearance. No other modifications allowed.
- .2 **Valve springs:** Must be stock for the 5 hp Briggs engine, minimum wire size .086 (Ref. .090/.086), inside dia. .615/.635 . Keepers can be stock or after market. The use of double springs or keepers is not allowed. Valve springs may not be shimmed. Upper valve keepers are allowed, but must be OEM. Using intake springs on the exhaust side and/or exhaust springs on the intake side is legal.

### **.11 Carburetor**

- .1 **(Super Stock Microd & Open Wheel), Carburetion is open.** ( only butterfly carbs no slide )
- .2 **Carburetion ( Jr Novice Microd & Open Wheel, Novice Microd & Open Wheel and Stock Microd & Open Wheel),** the carburetor will be stock with attached tank. The only modifications allowed are:
  - .1 To straight ream the bore to .700 maximum ID. ( Note this may not be advisable for restrictor plate classes ), The cast internal diameter on the block side of the carb must remain stock as cast.. If the expansion plug, in the end of the carb, is removed it must be remounted and sealed as stock.
  - .2 To drill the metering holes behind the main jet, Recommended size, .062 maximum diameter for the intake side hole and .033 maximum dia. for the block side hole, drilling the metering holes may improve tuning and enhance performance under certain conditions, care should be taken since drilling may also have a negative impact on performance, metering holes are a non-tech item, any size jet can be used.
  - .3 **Throttle shaft minimum thickness .086 at rear and .040 at front. Recess on the back side of throttle shaft must be a minimum of .030.**
  - .4 **Butterfly, no modification allowed, flat area where butterfly meets throttle shaft to be .059 minimum.**
  - .4 No choke required, if the choke is removed in a restrictor plate class the holes must be plugged with epoxy or similar material. If retained must remain stock and complete.
  - .5 Legal carb numbers are: 397135 Butterfly Choke, 555129 Motorsports no choke, 299437 Slide Choke (not legal for restricted classes)
  - .6 Throttle and Choke plate screws are non-tech, however modifying these parts to accept a different type screw is not allowed. Throttle and Choke stops are non-tech items.
  - .7 Air horn to remain as cast 1.011 max diameter at top .726 max. diameter bottom, no chamfer on 90 degree edge into carb. bore.

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## **Section 4.1 5 HP Briggs Classes, etc. 2010 (continued)**

### **.12 Restrictor Plate**

- .1 Illegal to bypass Restrictor plate by any means.
- .2 **Jr. Novice Microd and Open Wheel** must run the NYSMA Jr. Novice Restrictor Spacer .365 Dia., no modifications allowed. Plating must not be removed. Gaskets must be in place and intact on both sides of the plate. *The Jr. Novice re assembled with the round side of the tube facing the carb pulse hole and the flat side perpendicular within the bore. Also the hole in the side of the tube is centered with the pulse hole of the carb. (2008)*
- .3 **Novice Microd and Open Wheel** must run the WKA purple flat plate .425 Dia. NO-GO, no modifications allowed plating must not be removed. Gaskets must be in place and intact on both sides of the plate.
- .4 **Limited Microd** must run a WKA .500 ID. turquoise restrictor plate with no modifications, gasket intact both sides of plate.
- .5 **These restrictor plate sizes are subject to review during the race season and beyond. Additional measures may be taken to control car speed, such as exhaust restrictor plates, ignition limitation and or gearing limits.**

### **.13 Camshaft**

- .1 **Camshaft**, a stock or after market camshaft can be used. The camshaft will be examined by lift as described below, at the discretion of the inspection team the camshaft will be removed and examined by measurement, visual inspection and or lift. Cam shaft specification to follow WKA guidelines for future changes. **Lift specifications must be check after the installation of a new cam.**

Intake Lift	Degrees	Exhaust Lift	Degrees
.050	07 BTDC TO 0 TDC	.050	38 BBDC TO 33 BBDC
.100	10 ATDC TO 17 ATDC	.100	21 BBDC TO 16 BBDC
.150	29 ATDC TO 36 ATDC	.150	02 BBDC TO 03 ABDC
.200	55 ATDC TO 64 ATDC	.200	21 ABDC TO 31 ABDC
.233	maximum	.233	maximum
.200	43 BBDC TO 33 BBDC	.200	76 BTDC TO 65 BTDC
.150	13 BBDC TO 6 BBDC	.150	48 BTDC TO 40 BTDC
.100	06 ABDC TO 13 ABDC	.100	28 BTDC TO 21 BTDC
.050	23 ABDC TO 31 ABDC	.050	10 BTDC TO 4 BTDC

- .2 Slight variations in valve timing can be tried either by using different cams or adjusting valve lash or crank gear position any changes must still conform to the lift specifications listed. Changing the Valve Timing may change the optimum RPM. It is recommended that restrictor plate classes run cams intended for that use, Motors that require a restrictor plate should consider Dyno Cam part number 95/6 or 95/3.

- .14 **Lifters** Stock lifters or after market must be same size and shape as stock, **no undercutting of lifter boss allowed. – Only 45 degree cut up to .500.**

- .15 **Air Filter** Optional all 5hp classes

- .16 **Head Gasket** This is a non tech item. (2005-11/04/03)

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## **Section 4.1 5 HP Briggs Classes, etc. 2010 (continued)**

### **.17 Ignition**

- .1 Magneto must be stock OEM for the 5 hp engine, the magneto will be removed and examined, **plug wire resistance to be 2000 ohms minimum to 5000 ohms maximum**. Filing of magneto plate or any other modifications to the magneto to advance the spark will not be allowed. This also includes any modification to relocate or move stock mount. Points to trigger an electronic ignition, "Atom" ignition module and/or battery or total loss ignition are not allowed. No extra parts can be used to increase spark. The standard thread pitch and size of the magneto plate bolts may not be changed or modified, however, different head shapes are allowed. Coils may not be modified. Extra insulation is allowed on the plug wire and boot, boot can be aftermarket. The ignition can be advanced by the use of offset keys in the flywheel. Flywheel keys are a non-tech item. It is recommended that the ignition be advanced 3 to 5 degrees in this class. An offset key can be purchased for this class.

### **.18 Flywheel**

- .1 **Flywheel:** Will be removed and examined. Flywheel must be stock OEM for this 5 hp motor, NO modifications allowed to lighten balance or change flywheel in any way. Flywheel minimum weight 5 Lbs. 11 Oz.. Flywheel keys are a non-tech item.

### **.19 Exhaust**

- .1 **Exhaust Pipes:** Open exhaust non-tech item. The exhaust length in this class should be tuned to the RPM that is run. Track testing with different length pipes is recommended.

## **Section 4.0 Engine Modification and Specification**

### **Guidelines 2010**

#### **Section 4.2**

##### **Animal 6.5 HP Briggs**

##### **2010 Jr. Novice and Novice, 2011 Limited and 2012 all other classes in both Microds and Open Wheels**

#### **4.2.2 Briggs & Stratton WKA Stock Animal 6.5 HP:**

##### **.1 Restrictor plates:**

**Jr Novice:** A two hole WKA plate with a top hole of 0.235" and a bottom hole of 0.275" to be checked with a 0.236" NO-GO and 0.276" NO-GO.

**Novice :** A three WKA hole plate with 0.225" holes to be checked with a 0.226" NO-GO.

- .2 **SHROUDS & COVERS:** Engine shroud and covers and control bracket must be intact and not modified, except control cover which can be modified to attach fuel pump. Taping of flywheel screen allowed. Tape on block disallowed. Fixed screen must be affixed to shroud cool air intake area. Any bolt utilized to secure sheet metal, shrouding, etc., with the exception of sheet metal secured by the head bolts, may be replaced with a larger diameter bolt(s).

- .3 **HEADER/SILENCER:** Exhaust pipe/header must not extend past rear bumper and have no exposed sharp edges. Header shall have a min. length of 12" and a max length of 14" to be measured in the ID using a

## **Section 4.2 Animal Classes, etc. 2010 (continued)**

1/4" wide tape measure. Measurement to be made from the exhaust flange to the inside radius to the end of the pipe. Header/exhaust pipe may not protrude inside of exhaust port so as to alter port configuration for performance gain. Studs allowed for header pipe attachment to block. Gasket and/or Silicone allowed to seal the header. Header must be fixed design, NO SIPPY PIPES allowed. No extra tubes or extra holes allowed except hole for heat sensor probe if sensor is used. All header pipes must be of continuous length from flange to end of pipe. No Stages or butt welds permitted (no chamber, infusers, or covers of any type allowed). It is recommended that the safety wire wrap around pipe to insure that bolts remain with pipe in case they are stripped out of block.

- .3 AIR FILTER:** Any air cleaner permitted. Filter may not be used as an air ram and must filter from all areas as raced. Any open areas in filter must be covered with a filter sock. (No open areas allowed.)
- .4 CARBURETOR:** PZ Model 22 Carburetor. Only legal carb allowed. Any 1/4" bolts may be used to attach carb to intake. No studs allowed. Carb to intake seal is by O-Ring only. No sealer allowed. Air must enter carb at air horn ONLY. Choke must be as stock as from the factory. Spring can be used to hold choke in position. Must be stock as from the factory. Adapter will be allowed on end of fuel inlet of carburetor for attachment of 1/4" Fuel line. Any parts that are inside the float bowl or can be removed through the float bowl are non tech items with the exception of the fuel discharge nozzle height in the venture. This is a tech item for height only. The end of the nozzle maybe modified. The end of the nozzle may not protrude into the venture more than .060". The float and needle must be present in their stock location and Maximum throttle bore inside dimension is .874" NO-GO. Must be as cast. Air metering hole must retain its stock configuration. It must be round and may not be relocated. It must function as intended. No additional parts may be added. Air pick hole Maximum .061" No-GO. Needle Jet - Taper on needle must remain stock and will be checked at .500" from the tip of the needle and must not be smaller than 0.070 NO-GO"
- .5 Choke bore:** 1.149" No-Go. Must be as cast.
- .6 VENTURI:** Vertical .792" No-Go Horizontal .615" No-Go. No machining allowed.
- .7 Slide:** Minimum length top edge of slide to deepest part of cut away 1.148". Must be stock as from the factory.
- .8 INTAKE:** Stock animal intake as supplied from the factory. No modifications allowed. Intake mounting hole to be checked with a 0.328" NO-GO. Length: 1.740" NO-GO, 1.760" MUST-GO. Inside I.D. .905" MUST-GO Max. .885" NO-GO Min.
- .9 INTAKE TO BLOCK GASKET:** Thickness .070" max.
- .10 FUEL PUMP:** Auxiliary pulse-type fule pump allowed. Fuel pump must be pulsed only from the crankcase upper oil fill cap only. No hoses or tubes to or from intake.

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## **Section 4.2 Animal Classes, etc. 2010 (continued)**

- .11 VALVE COVER:** Stock valve cover as from the factory. (No threading of breather hole allowed). Valve cover gasket must meet stock configuration. No sealer allowed.
- .12 ROCKER ARMS:** Must be stock as from the factory.  
Overall length 2.880" + or - .005".
- .13 CAMSHAFT:** All cam profile readings must be taken with zero valve lash and degree wheel at top dead center (TDC) of compression stroke.  
Readings shall be measured from push rods. Set dial indicator at zero and do not reset during the profile process. Only stock factory camshaft cores from Briggs & Stratton are permitted, part numbers 555532 and 555584. Lobes may be ground but not to exceed .870 base circle.  
Mechanical compression relief is non-tech. Camshaft lobes must remain flat and of original width. Maximum valve lift of .255" taken directly off the valve assembly at zero valve lash. Place dial indicator on valve keeper then tighten ball rocker till you see indicator move 0.001" to 0.002" this will assure that all the lash is taken out of the valve. zero indicator at TDC. When checking the lift off the valve keeper the only dial indicator holder that will be used is a three leg holder. Only Sox holder #AT320A or similar indicator holder.

### **Camshaft Profile Limits Zero indicators at TDC**

	EXHAUST	INTAKE
.020"	61 BBDC TO 56 BBDC	18 BTDC TO 13 BTDC
.050"	44 BBDC TO 40 BBDC	0 TDC TO 4 TDC
.100"	27 BBDC TO 23 BBDC	16 ATDC TO 20 ATDC
.150"	11 BBDC TO 7 BBDC	33 ATDC TO 37 ATDC
.175"	1 BBDC TO 3 ABDC	42 ATDC TO 46 ATDC
.200"	10 ABDC TO 14 ABDC	53 ATDC TO 57 ATDC
.225"	24 ABDC TO 28 ABDC	67 ATDC TO 71 ATDC
MAX	Max Lift is .257" at cam	Max Lift is .257" at cam
.225"	78 BTDC TO 74 BTDC	39 BBDC TO 35 BBDC
.200"	64 BTDC TO 60 BTDC	25 BBDC TO 21 BBDC
.175"	53 BTDC TO 49 BTDC	15 BBDC TO 11 BBDC
.150"	43 BTDC TO 39 BTDC	5 BBDC TO 1 BBDC
.100"	27 BTDC TO 23 BTDC	12 ABDC TO 16 ABDC
.050"	10 BTDC TO 6 BTDC	28 ABDC TO 32 ABDC
.020"	5 ATDC TO 10 ATDC	44 ABDC TO 49 ABDC

- .13 BALL ROCKER:** As stock from the factory. .600" + or - .010" diameter.
- .14 PUSHROD:** As stock from the factory. .185" - .190" diameter. Length 5.638" - 5.656".
- .15 HEAD BOLTS:** Stock head bolt must be utilized and four are mandatory.
- .16 HEAD GASKET:** Must be of stock configuration. Aftermarket head gaskets are allowed of stock design. Gasket sealer **CANNOT** be utilized on head gasket.  
.049" min. thickness measured in four places between head bolts. Measurement to be made from inside of gasket. Measurement to be made with micrometers.
- .17 CYLINDER HEAD PLATE:** Must be stock as from the factory.

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## **Section 4.2 Animal Classes, etc. 2010 (continued)**

Cylinder head plate gasket must be stock configuration. .055" Max thickness.

- .18 ROCKER ARM STUDS:** Must be in stock as from the factory. Rocker stud must be installed as factory intended. 90 degrees to the plate surface.
- .19 VALVES:** Stock valves ONLY. Must be one angle. Valves may not be polished or lightened. If working area (that portion of the valve stem translating with the valve guide area) of valve stem is cleaned, no material may be removed, such as linear grooves, crosshatching, etc. Minimum intake and exhaust valve length 3.250".
- .20 INTAKE VALVE:** 45 degrees. Intake valve minimum diameter is 1.055" - 1.065". Depth of dish is valve .99" - .119". Minimum height from angle of valve face to top of valve 0.057" using gauge (A26) (check using depth micrometer from top of to the gauge).
- .21 EXHAUST VALVE:** 45 degrees. Exhaust valve minimum diameter .935"- .945". Depth of dish in valve .084" - .104". Minimum height from angle of valve face to top of valve 0.060" using gauge (A27) (check using depth micrometer from top of to the gauge).
- .22 VALVE SPRINGS:** Stock Briggs & Stratton valve springs and keepers are mandatory. Springs must remain unaltered as supplied from the factory.
- .23 INTAKE & EXHAUST SPRING:** Maximum valve spring length is .930".  
.103" - .107" wire diameter, measured in three places on spring. Inside diameter of spring .615" minimum, .635" maximum. Must be identical in appearance to the factory part and to have 4 to 4 3/4 coils in stack.
- .24 VALVE SPRING RETAINERS AND KEEPERS:** Stock as from factory. .060" - .075" thickness.
- .25 CYLINDER HEAD:** Stock Briggs & Stratton cylinder head part #555635 Machining of head gasket surface only allowed. Bosses on head may be tapped to allow for the attaching of a header brace. No machining of ports allowed. No beed basting of the ports or any part of the head. Depth of head at shallow part of head .011" minimum. Depth at floor of head .319" minimum. Depth to top of valve seat: .360" max., .335" min.  
Head thickness measured from the head gasket surface is 2.420" (A29) Head thickness to be checked in four places through the valve guides and the push rod holes with the gauge. Not calipers.
- .25 VALVE SEATS:** Must be one angle only on valve seats. Stock Briggs & Stratton valve seats are mandatory.  
Intake seat inside diameter, .966" - .972".  
Exhaust seat inside diameter, .844" - .850".  
Exhaust and intake seat 45 degree angle.
- .26 PORTS:** Must have stock configuration. Stock as supplied from factory. No modifications. No sanding buffing or alterations of the surface finish or any port dimension. No deburring anywhere inside the intake or exhaust ports. Ports are to remain AS CAST.  
There must be a single angle with a defined edge at the transition between end of intake port and the bowl behind the valve. NO media blasting.
- .27 INTAKE INLET:** .918" No-Go when checking 90 degrees to stud pattern no-go will be straight, when checking in line with stud pattern no-go will set on floor of port at bottom and stop at upper

## **Section 4.2 Animal Classes, etc. 2010 (continued)**

edge of port on top. 0.864" NO-GO cannot touch the valve guide of the intake port. 0.860" plug gage will be used as a visual check of the eyebrow area. This is not a NO-GO but a visual assist tool.

- .28 VALVE GUIDES:** Stock valve guides as supplied from the factory. Maximum depth from intake cylinder gasket to surface to top of valve guide is 1.255".
- .29 Exhaust Outlet:** 0.980" NO-GO If there is one entry point to the port where the NO-GO gauge cannot enter the port, and the port is as supplied from the factory with no grinding or alteration, the port is legal.
- .30 DESK/PISTON CLEARANCE:** Machining of deck surface is permitted. Piston pop-up CANNOT exceed .005" above block surface in the center of the piston. When measuring piston pop-up, it should be accomplished with bar stock on a parallel with the piston wrist pin in center of the piston, and using a dial indicator check the piston pop-up in this area.
- .31 CYLINDER BORE:** No circular or machined grooving of cylinder is allowed in any position of cylinder. Stock cylinder bore is 2.690" and overbore is permitted providing it does not exceed 2.725" (approximately .035" overbore).
- .32 STROKE:** Stroke is 2.204" max. Stroke is checked by pushing piston down to take up play of rod clearance. Stroke is checked from bottom dead center (BDC) to top dead center (TDC).
- .33 IGNITION:** Briggs & Stratton factory stock coils are MANDATORY and must be utilized in unaltered form. NO slotting of mounting holes or machining of attaching bolts is permitted. There must be resistance from ground to the plug wire. SPARK PLUG CONNECTOR must be stock factory type. Rubber plug boot is allowed. NOTE: Coils may be rechecked for correct ohms after a minimum of 10 minutes.
- .34 STARTER:** Recoil starter may be retained as produced and intact, if recoil is removed, starter cup must also be removed. Any style nut and use of electric starter allowed.
- .35 FLYWHEEL: Must use Stock flywheel key ONLY.**  
ONLY stock briggs part # 555625 with plastic fins (Minimum weight 4 lbs. 8 oz) along with coil must be stock part # 557040 in unaltered form. If stock part number 555683 with plastic fins (Minimum weight 4 lbs. 4 oz) is used the stock PVL magneto Briggs part # 555683 must be utilized in unaltered form. No machining, glass beading or sandblasting of flywheel is allowed. Chipped fins because of poor casting is allowable, however, completely broken fins are NOT allowed. Any screen or guard that fully covers the flywheel fins is allowed EXCEPT NO revolving screens. All screens must be bolted to blower housing. Flywheel washer must be stock. There must be resistance from the ground to the end of the spark plug wire. Must be 3,000 ohms minimum and 6,000 maximum.
- .36 CRANKCASE SIDE COVER:** Side cover must remain stock.
- .37 CRANKCASE SIDE COVER GASKET:** After market gaskets approved, however, must be the same size and material as stock gasket(s). One or two crankcase gaskets are allowed.
- .38 VALVE LIFTERS:** Stock lifter as supplied from factory.

## **Section 4.2 Animal Classes, etc. 2010 (continued)**

Head of lifter have a min .820" diameter, .860" diameter max..  
Maximum length of lifter 1.525", 1.515" minimum.

- .39 CONNECTING ROD:** Stock connecting rod ONLY. Connecting rod may not be lighter in weight than know stock component. No under-sizing of connecting rod is permitted, however, rod may be clearanced providing that it is in stock configuration and finish with no "dimpling" or media lasting. Rod ends must be concentric with crankshaft journal and/or wrist pin with no chamfer or breaking of edges. minimum weight 130 grams  
Stock rod length is 2.419" minimum, 2.429" maximum. Measured from bottom of wrist pin to top of crankshaft journal. Oil hold opening, new or old style rod, is .185" NO-GO.  
BILLET ROD — World Formula or any WKA approved commercially available billet aluminum rod with or without Inserts allowed. Rod must be identified by manufacturer with the following: Registered Trade Mark or Manufacturers Name for identification purposes. No titanium rods or rod bolts allowed. Rod must meet the following specifications: Minimum weight 130 grams, Max oil hole diameter 0.185", Length measured (with inserts if used) 2.414" Minimum, 2.429" Maximum.
- .40 WRIST PIN:** Wrist pin must not be altered. Maximum inside dimension of wrist pin is .414". Outside dimension is .624" - .626". Minimum length is 1.901".
- .41 RINGS:** Three rings are MANDATORY. Compression, or top ring, chamfer or O must face up, and must remain as manufactured. Scraper ring must be installed with inside chamfer down and O up. Stock oil ring must be installed as from factory. Ends of ring must remain flat. Excessive end gapping of rings not allowed. Rings must conform to all listed factory specifications and be of stock configuration. Known, standards for piston/ring configurations are Briggs & Stratton factory approved parts. No machining of rings allowed. Exception: lapping and end gapping allowed. Rings must be in one piece when removed from block.  
Minimum width top two rings .095".  
Thickness top two rings .059" - .064".  
Oil ring minimum width .065", ring groove must be present. Expanded ring must be installed. Oil ring thickness .098" - .102".
- .42 PISTON:** Stock, unaltered Briggs & Stratton piston MANDATORY. Wrist pin hole must not be altered or relocated. Deck above top ring must not be altered. NO machining is allowed on piston. Arrow must point toward flywheel. From top to piston to wrist pin bore .658" minimum measurement. Check on circlip side of piston. Minimum piston length is 1.768".
- .43 CRANKSHAFT:** Stock factory crankshaft mandatory. Stock factory timing gear mandatory, and must be installed properly. Lightening, polishing of counter weights, addition of metal or other material is not permitted. Offset crankshafts are not permitted. After-market bearing of non self-aligning type, with or without shield, is permitted. Shims, if used, must be installed as from factory. Crankshaft journal diameter is 1.094" - 1.100".
- .44 BLOCK:** Must be produced, with no alterations or reworking. Blocks repaired from broken rod damage, are permitted providing that repair does not constitute a functional modification of original block. No bushings of any kind allowed except for bushings approved by the tech manual.  
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repair of one coil post is allowed, as long as the remaining post is factory and unaltered. No KNURLING of guides allowed.

**Section 4.2 Animal Classes, etc. 2010 (continued)**

**.45 WELDING:** No welding can be done to an engine from the cooling fins upwards. The only welding permitted is to repair damage from a broken rod.

**.46 Fuel Lines:** Fuel lines must be safety wrapped at all connecting points.

**Section 4.3 Modified Open Wheel 2010**

**.1 Motor**

.1	14.55 Max. Cubic Inch Displacement	Any 4 cycle, single cylinder flat head
	(150 cc), 9.15 Cubic In. Max.	Any 4 cycle O.H.V.
	(88 cc), 5.37 Cubic In. Max.	Any 2 cycle

**.2 Modifications**

- .1 All Modifications allowed, must meet maximum displacement allowed for type of motor.
- .2 Forced induction, turbo chargers, super chargers or other similar boosters are not allowed.**
- .3 Diaphragm Type Carbs with pumps are acceptable.

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## **Section 5.0 Engine Teardown Procedures 2010**

### **Section 5.1 Standard Post-Race Engine Teardown**

Note: Teardown does not have to be done in this exact order. For specifications and rules, refer to previous sections.

- .1 Check air cleaner for classes requiring air cleaner.
- .2 Have engine removed for teardown.
- .3 Have clutch, oil, and exhaust removed.
- .4 On engines with restrictor plates, inspect restrictors as soon as possible before removing carb. To make sure of proper sealing, watch as carb is being removed on engines with restrictors. Check gaskets, bolts, etc.
- .5 Remove carb, inspect.
- .6 Remove head and engine shrouds. Tech head. Carbon may be removed.
- .7 Tech head gasket if possible.
- .8 Tech bore.
- .9 Remove valve spring cover plate.
- .10 Inspect retainers.
- .11 Remove valve springs, tech for being OEM.
- .12 Set up degree wheel, pointer and dial indicator in preparation for profiling camshaft, checking valve lift, and stroke.
- .13 Piston stop method is to be used for location T.D.C.
- .14 All cam profile readings must be taken with zero valve lash. When checking cam profile, rotate engine in normal direction of rotation only. Valves should have no clearance and no spring tension when checked (springs removed). A rubber band can be used to put light amount of down pressure on dial indicators.
- .15 At any one check point on either or both the intake or exhaust cam profile, being out by 1/2 degree is allowed.
- .16 If cam profile is found to be illegal, T.D.C. should be rechecked (relocated) and cam profile checked again.
- .17 If illegal, prove to owner/handler at this point while engine is assembled and tools are set up.
- .18 Check stroke.
- .19 Remove valves and check for legal angles and minimum & maximum sizes.
- .20 Examine ports and seats.
- .21 Examine guides for stock location.
- .22 Remove flywheel and examine.
- .23 Remove side cover.
- .24 Remove cam, inspect.
- .25 Examine lifters
- .26 Remove piston wrist pin and examine.
- .27 Examine rings.
- .28 Examine rod and check length.
- .29 Remove crank and examine.
- .30 Notify competitor of any illegal item or items.

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**Section 5.2 Modified Post-Race Engine Teardown 2010**

- .1 Numbers 1 through 5 are placed in a hat for drawing.
- .2 A number is drawn for each class being raced at that event.
- .3 Neither the numbers drawn nor the items to be teched will be made known prior to the actual inspection.
- .4 The portion of the engine teardown for a class is performed based on the number drawn for that class and the matching items listed below.
- .5 Any questionable items not listed below, but noticed at the time of inspection, may be inspected at the discretion of the inspection team.
- .6 If, after the completion of the modified teardown, a member of the class feels the need for additional inspection, they can exercise the right to a Standard Post-Race Engine Teardown by using the NYSMA Official Protest form. The form must be submitted along with a \$25.00 inspection fee per engine to the Race Director, NYSMA President, or a member of the Race Committee within 15 minutes of the completion of that classes' teardowns. The protester must also teardown their engine for inspection.

Choice	Inspection
#1	Remove & inspect carb. Inspect restrictor plate Remove exhaust Inspect ports visually and with no-go gauge
#2	Remove head and valve cover Inspect head and head gasket Remove and inspect valves, springs, and retainers Inspect ports visually and with no-go gauge Check bore and stroke Check valve timing and lift
#3	Remove flywheel guard Remove and weigh flywheel Inspect for stock ignition
#4	Remove side cover Visually inspect crank, rod, cam, and lifters
#5	No teardown