

N.Y.S.M.A.

NEW YORK STATE MICROD ASSOCIATION

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Chapter 3 - Engine Specifications

Section 1.0 Introduction to Engine Rules(revised 2/00)

- .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.

*New York State Microd Association, Inc.
Engine Rules and Specifications for All Classes*

CLASS	Max Displacement	Engine Type
Novice	12.97 cubic inches Maximum	Briggs 5 HP
MR-1 Limited	9.35 Cubic Inches Maximum	Tecumseh H-30 Only. Older big valve engines may be used.
Jr. Novice Novice MR-1 Stock MR-2 Super Stock Jr Novice Open Wheel Novice Open Wheel Stock Open Wheel Heavy Open Wheel	12.97 Cubic Inches Maximum	Briggs 5 HP
MR-2 Stock	13.95 Cubic Inches Maximum	Tecumseh H-60 Tecumseh Motorsport 5 HP
Mod. Open Wheel	14.20 Cubic Inches Maximum 150 cc, 9.15 Cubic In. Max. 88 cc, 5.37 Cubic In. Max.	Any 4 cycle single cylinder Flat Head Any 4 cycle O.H.V. Any 2 cycle
Novice Classic MR1 Classic MR2 Classic	n/a	Tecumseh H-30 Only. Club motors - newer small valve engines.

Section 3.0 Fuel/Oil Requirements

- .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 Hi-test 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

Section 4.1 MR-1 Limited Class

- .1 **Motor**
 - .1 **MR-1 Limited Class:** Tecumseh H-30 large valve or small valve motor may be used for the 00 race season. This motor comes in many variations, it is recommended that the model with a cast iron sleeve and ball bearing side cover be used. Tecumseh Model H-30-35437Y. Other models of this motor may be used as long as they comply with all specifications. **(For the 01 race season and beyond this class will either be eliminated, modified to use 5HP Briggs or combined with the current stock 5HP class)**
- .2 **Modifications**
 - .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.

Section 4.1 MR-1 Limited Class (continued)

.3 Engine Block

- .1 Cylinder Bore:** Boring is allowed and engine may use the standard .010 or .020 oversized piston. Engines may be re-sleeved. New motors need not be rebored - there is insignificant performance gain in reboring motors. Bore specification 3 h.p. 2.500 in. To 2.520 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 warp, no multiple angles. A piston protrusion of .012 may yield improved performance in this class.
- .3 Ports:** Intake and Exhaust Ports, Ports are a tech item. Intake port is subject to .820 in. No-Go gauge check. Exhaust Port is subject to .740 in. (side port .820 in.) No-Go gauge check. (Side Port Motors with threaded exhaust ports must be checked with Tech. Inspector prior to use.)
- .4 NO ADDITION OF MATERIAL ALLOWED.** Block may not be machined on intake or exhaust port surfaces. 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 recommended. Additional grinding will be helpful and offer a small performance gain, care should be taken not to enlarge ports beyond spec. The bump on the lower portion of the port near the valve stem can be ground flat and low pressure portions of the port ground to improve flow. Care should be taken not to remove an excess amount of material since this may be detrimental to performance.
- .5 Valve Seats:** Angle on valve seats optional. It is recommended that the valve seat be cut with two angles minimum one of 45 deg. and one for clearance of 32 deg. 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 .875 in. no go gauge, Exhaust seat will be checked with a .875 in. no go gauge.
- .6 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.

.4 Cylinder Head

- .1** Stock head can not be modified except for the following; (head will be removed and examined) Planing and/or sanding to remove warp 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.

.5 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. Stroke is 1.860 in. Maximum, 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 the crankshaft gear is pressed on to the crank. This gear can move and change the valve timing. The gear can be repositioned on the crank to advance or retard valve timing some performance gain may be seen. 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 (approx. .007 in. movement is equivalent to 1 deg.) and that the valve timing be checked after any change or after the installation of a new cam, to assure that the valve timing is still in spec.**

Section 4.1 MR-1 Limited Class (continued)

.6 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 3.545 in. max. to 3.515 in. min. center to center. In this class racing rods can be purchased from the club. There will not be a performance gain in this class with the use of a racing rod it will only improve the durability and wear of the motor. A racing rod is recommended in the Limited Class.

.7 Wrist Pins

- .1** Stock only, no modifications.

.8 Piston

- .1 Piston:** Must be stock OEM - no modifications. 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 Lifters

- .1** Stock lifters only

.11 Valves and Valve Springs/Keepers (Vales must be OEM stock for this motor.)

- .1 Intake valve** diameter .985 max. .965 min.
Exhaust valve: diameter .985 max. .965 min.,
Both valves to have only one angle of 45 degrees (with no back angle). 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. Using the intake valve on the exhaust side and /or the exhaust valve on the intake side is allowed.
- .2 Valve springs and keepers** must be stock for the 3 hp engine. 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. Upper keepers are available for this engine part number 31671. Using intake springs on the exhaust side and/or exhaust springs on the intake side is legal.

.12 Camshaft

- .1 Camshaft:** A stock or after market cam allowed. Cams for this class can be purchased from Dyno Cam (910-655-9035), or other manufactures. The camshaft will be examined by lift as described below. **Lift specifications must be checked after installing a new cam.**

Intake		Exhaust	
Lift	Degrees	Lift	Degrees
.025	09 BTDC / 01 ATDC	.025	43 BBDC / 33 BBDC
.050	02 ATDC / 12 ATDC	.050	31 BBDC / 21 BBDC
.100	19 ATDC / 29 ATDC	.100	14 BBDC / 04 BBDC
.150	41 ATDC / 51 ATDC	.150	08 ABDC / 18 ABDC
.204	maximum	.204	maximum
.150	16 BBDC / 06 BBDC	.150	53 BTDC / 43 BTDC
.100	06 ABDC / 16 ABDC	.100	31 BTDC / 21 BTDC
.050	23 ABDC / 33 ABDC	.050	13 BTDC / 03 BTDC
.025	34 ABDC / 44 ABDC	.025	02 BTDC / 08 ATDC

Section 4.1 MR-1 Limited Class (continued)

- .2 It is recommended that the valve timing for this cam be set as follows, set the valve lash so that the intake valve closes at 65/70 Deg. ABDC the exhaust valve should close at 25/ 30 Deg. ATDC. Or use the information provided with the after market cam. Slight variations in valve timing can be tried either by 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 to run.

.13 Carburetor

- .1 **Carburetion**, the carburetor will be stock, carburetor that comes with the 3 hp motor, with the gooseneck attached.
The only modifications allowed are:
 - .1 To straight ream the venturi to the .515 maximum diameter if it is below this dimension. The venturi will be checked with a .515 no go gauge.
 - .2 To drill the metering holes behind the soft plug, .043 maximum for the block side hole, .050 maximum for the middle hole and .029 maximum for the intake 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.
 - .3 The main jet can be reamed or drilled to .078/.081 dia. if it is undersized. The metering holes and main jet are a non-tech item.
 - .4 There can be no modifications to the gooseneck, **the mold marks and flashing must be present**, if there is excessive flashing in the gooseneck consult your tech inspector. The stock choke plate and shaft must remain in the carburetor. The throttle shaft and choke shaft has one flat, minimum thickness is .113 in. The throttle stop and choke stop are non-tech items. They may be bent, adjusted or modified to obtain the full range of movement from idle to wide open. (The choke stop on Tecumseh carburetor is a small vertical rib inside the air horn at the top. Material may be removed from this rib only to allow the choke plate to fully open.) Throttle and choke plate screws are non-tech, however modifying parts to accept a different type of screw is not allowed.

.14 Head Gasket

- .1 **Head Gasket**: Stock or stock replacement only no modifications. For this class there are two Tecumseh gaskets available, part number 29953C for the .063 in. gasket and 36437 for the .045 in. Gasket. Either can be used depending on the piston protrusion of your motor.

.15 Restrictor Plate

- .2 **Limited**, No restrictor plate.

.16 Air Filter

- .1 Air filter must be stock, air filter will be removed and examined. Air filter housing can be modified, but must be used to hold air filter in position. Air filter adapter plate can not have any holes in it. Air filter is to be mounted so that all air passes through the filter. Adding holes or increasing the size of the openings in the material is not allowed. Air filter must be intact on the carburetor at the end of the race. The use of oil on the filter and/or grease between filter and adapter plate is allowed. Only OEM style of pleated paper is legal (not foam filters) for Tecumseh engines.

New York State Microd Association, Inc.
Engine Rules and Specifications for All Classes

.17 Ignition

- .1 Magneto must be stock OEM for the 3 hp engine, the magneto will be removed and examined. 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 made by filing an oversized key to offset approx. .020.

.18 Flywheel

- .1 **Flywheel:** Will be removed and examined. Flywheel must be stock OEM for this 3 hp motor, NO modifications allowed to lighten balance or change flywheel in any way. Flywheel minimum weight 7 LBS. Flywheel keys are a non-tech item.

.19 Exhaust

- .1 **Exhaust Pipes:** Open exhaust non-tech item. The exhaust recommended in this class is approx. 12 to 14 inches long some what shorter than Jr. Novice due to higher RPM.

Section 4.2 Jr. Novice, Novice, Stock, Super Stock, Jr. Novice & Novice Open Wheel, Stock Open Wheel, Super Stock Open Wheel.

.1 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 +.034 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.

Section 4.2 5 HP Briggs Classes etc. (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. (No additional material or repair is allowed in port area)
- .4 Wrist Pins**

 - .1** Stock only, no modifications.
- .5 Cylinder Head**

 - .1 Cylinder Head:** Stock head can not be modified except for the following; (head will be removed and examined) Planing and /or sanding to remove warpage is allowed, but reliving 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 their 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.

Section 4.2 5 HP Briggs Classes, etc. (continued)

.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 32 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. .625/.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 (MR-2 Super Stock and Heavy Open Wheel), Carburetion is open.**
- .2 Carburetion (Novice Open Wheel, MR-1 Super Stock and Stock 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)
 - .2** To drill the metering holes behind the main jet, .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, any size jet can be used.
 - .3** Throttle shaft minimum thickness .086 at the front .050 at the rear.
 - .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.

Section 4.2 5 HP Briggs Classes, etc. (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.
- .3 **Novice Microd and Open Wheel** must run the NYSMA Novice Restrictor Spacer .427 Dia., no modifications allowed plating must not be removed. Gaskets must be in place and intact on both sides of the plate.
- .4 **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		Exhaust	
Lift	Degrees	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

- .1 Stock lifters or after market must be same size and shape as stock.

.15 Air Filter

- .1 **Optional all 5hp classes**

.16 Head Gasket

- .1 Stock or any OEM replacement, minimum thickness .045

Section 4.2 5 HP Briggs Classes, etc. (continued)

.17 Ignition

- .1 Magneto must be stock OEM for the 5 hp engine, the magneto will be removed and examined. 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. 12 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 4.3 MR-2 Stock

.1 Motor

- .1 **Motor: Tecumseh** H-60, part number 90205, motor may 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, the Tecumseh Motor Sports 5 hp motor, part number 756994K, can also be used, any older Tecumseh 6-HP motor may be used as long as it complies with all specifications contained in this section.

.2 Modifications

- .1 **Any modifications not mentioned in these rules are not allowed.**
- .2 All forms of engine governing and compression release can be removed, this includes all external linkages and springs connected to the carburetor. The plastic governor gear inside the motor should be removed. Bushings and or roller bearings may be installed in worn guides for either end of camshaft (NOTE 6HP ONLY!).

.3 Engine Block:

- .1 **Cylinder Bore:** Boring is allowed and engine may use the standard .010 or .020 oversized piston. Engines may be re-sleeved. New motors need not be rebored there is insignificant performance gain in reboring motors. Bore specification 6 h.p. 2.625 in. To 2.645 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 may yield improved performance in this class.
- .3 **Ports:** Intake and Exhaust Ports, Ports are a tech item. Intake port is subject to 1.020 in. No-Go gauge check. Exhaust Port is subject to .960 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.

Section 4.3 MR-2 Stock (continued)

- .4 **Valve Seats:** Angle on valve seats optional. It is recommended that the valve seat be cut with two angles minimum one of 45 deg. and one for clearance of 32 deg. 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 1.086 no go gauge, Exhaust seat will be checked with a 1.023 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.

.4 Cylinder Head

New York State Microd Association, Inc.
Engine Rules and Specifications for All Classes

- .1 **Cylinder Head:** Stock head can not be modified except for the following: (head will be removed and examined) Planing and /or sanding to remove warpage is allowed, but reliving for valves or piston or any other modifications will not be allowed. Dimension from the spark plug spot surface to the cylinder head gasket surface to be .720 in. min.
- 5 **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. Stroke is 2.520 in. Maximum, 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 the crankshaft gear is pressed on to the crank. This gear can move and change the valve timing. The gear can be repositioned on the crank to advance or retard valve timing some performance gain may be seen. 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 (approx. .007 in. movement is equivalent to 1 deg.) and the valve timing be checked after any change to assure that the valve timing is still in spec.
- 6 **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 3.967 in. +/- .010 center to center. In this class racing rods can be purchased from the club or after market. There will not be a performance gain in this class with the use of a racing rod it is recommended to improve durability.
- 7 **Lifters**
 - .1 Stock lifters or after market, must be same size and shape of stock.
- 8 **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.

New York State Microd Association, Inc.
Engine Rules and Specifications for All Classes

Section 4.3 MR-2 Stock (continued)

.9 Camshaft

- .1 Camshaft:** The Cam shaft will be stock or after market. Must conform to lift profiles listed. The camshaft will be examined by lift as described below. Cams intended for the WKA 5hp Tecumseh Gas class can be used and purchased from Dyno Cam (910-655-9035). **Lift specifications must be checked after the installation of a new cam.**

Intake		Exhaust	
Lift	Degrees	Lift	Degrees
.050	05 BTDC / 05 ATDC	.050	37 BBDC / 27 BBDC
.100	08 ATDC / 18 ATDC	.100	23 BBDC / 13 BBDC
.150	22 ATDC / 32 ATDC	.150	11 BBDC / 01 BBDC
.200	39 ATDC / 49 ATDC	.200	07 ABDC / 17 ABDC
.270	maximum	.270	maximum
.200	21 BBDC / 11 BBDC	.200	56 BTDC / 46 BTDC
.150	05 BBDC / 05 ABDC	.150	40 BTDC / 30 BTDC
.100	08 ABDC / 18 ABDC	.100	25 BTDC / 15 BTDC
.050	22 ABDC / 32 ABDC	.050	12 BTDC / 02 BTDC

- .2** It is recommended that the valve timing for this cam be to the manufacturers recommendations. Slight variations and valve timing can be tried either by 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 to run.

.10 Wrist Pins

- .1** Stock only, no modifications.

.11 Piston

- .1 Piston:** Must be stock OEM no modifications. The top of piston must remain flat, can be cut or sanded to achieve the desired piston protrusion.

.12 Valves and Valve Springs/Keepers

- .1 Intake valve** diameter 1.238 max. 1.195 min. (must be OEM stock for this motor)
Exhaust valve diameter 1.181 max. 1.131 min., (must be OEM stock for this motor)
Both valves to have only one angle of 45 degrees (with no back angle). 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. Using the intake valve on the exhaust side and /or the exhaust valve on the intake side is allowed.
- .2 Valve springs and keepers** must be stock for the 6 hp engine. 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. The after market valve retainers that may be shipped with the motor sports motor are not allowed.

.13 Head Gasket

- .1 Head Gasket:** Stock or stock replacement only no modifications. For this class there are two Tecumseh gaskets available part number 28938 for the .063 thick gasket and 36445 for the .045 thick gasket.

Section 4.3 MR-2 Stock (continued)

.14 Air Filter

- .1 Air filter must be stock, air filter will be removed and examined. Air filter housing can be modified, but must be used to hold air filter in position. Air filter adapter plate can not have any holes in it. Air filter is to be mounted so that all air passes through the filter. Adding holes or increasing the size of the openings in the material is not allowed. Air filter must be intact on the carburetor at the end of the race. The use of oil on the filter and/or grease between filter and adapter plate is allowed. Only OEM style of pleated paper is legal (not foam filters) for Tecumseh engines.

.15 Carburetor

- .1 **Carburetion**, will be stock, carburetor that comes with the standard 6 hp H-60 motor, part number 632230. Note the carbs that come with the 5hp motorsports motor can not be used, older carbs. with .625 venturi may be used. Stock spacer behind carb must be intact and in place.
- .2 The only modifications allowed are:
 - .1 To straight ream the venturi to the .625 maximum diameter if it is below this dimension. The venturi will be checked with a .625 no go gauge.
 - .2 To drill the metering holes behind the soft plug to a maximum .043 for the first hole, .030 for the second and .029 for the last 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.
 - .3 The metering holes and main jet are a non-tech item.
 - .4 The stock choke plate and shaft must remain in the carburetor. The throttle shaft and choke shaft has one flat, minimum thickness is .113 in. The throttle stop and choke stop are non-tech items. They may be bent, adjusted or modified to obtain the full range of movement from idle to wide open. (The choke stop on Tecumseh carburetor is a small vertical rib inside the air horn at the top. Material may be removed from this rib only to allow the choke plate to fully open.) Throttle and choke plate screws are non-tech, however modifying parts to accept a different type of screw is not allowed.

.16 Ignition

- .1 Magneto must be stock OEM for the 6 hp engine, the magneto will be removed and examined. 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 advance 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 made by filing an oversized key to offset approx.. .020.

.17 Flywheel

- .1 **Flywheel**: will be removed and examined. Flywheel must be stock OEM for a 6 hp Tecumseh motor, NO modifications allowed to lighten balance or change flywheel in any way. Flywheel minimum weight 6.5 LBS. Flywheels on older motors are lighter than the one currently produced. Flywheel keys are a non-tech item.

.18 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 4.4 Modified Open Wheel

.1 Motor

- | | | |
|----|------------------------------------|--|
| .1 | 14.20 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.

Section 5.0 Engine Teardown Procedures

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 3 hp 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 - OEM only.
- .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.

Section 5.2 Modified Post-Race Engine Teardown

- .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