

KSUSA Briggs World Formula Rules 2010

This version supersedes all previous versions!

Effective October 7, 2009

717 Briggs & Stratton World Formula Engine Rules

All parts must be B&S factory production parts unless otherwise noted in these rules. No machining, **polishing** or alteration of **any** parts is permitted unless specifically noted in these rules. All parts are subject to comparison with a known stock part.

717.1: Shrouds and covers: All shrouds and covers must be run as supplied. Cylinder shield may be bent slightly or drilled around spark plug hole to allow fitting cylinder head temperature lead and clearance for Coil Ground lead. Flywheel Cover, Top Cover and Plate are non tech items. They are replaced by Part # 555699.

717.2 : Header and silencer

717.2.1: Factory header or RLV part number 5442S. Any exhaust gasket or no exhaust gasket allowed. Sealer allowed on header. Header nuts are not required to be safety wired. Bottom bracing must be bolted to head. Factory header may be cut and turned to fit car as long as the overall length and tube size remains the same as the stock factory header: OAL 20.5" OD .9375" x .065 wall (ID .807 +/- .005) **Coating the pipe is allowed.**

717.2.2: Exhaust gas temp sensor is optional.

717.2.4: RLV Silencer #4100 required. **If inside baffles on muffler are loose and rattle or have been altered or removed, the muffler will be deemed illegal. Coating is allowed**

717.2.5: Springs attaching Silencer to header must be safety wired.

717.3 : Electric starter: Starter motor must be operational and capable of starting engine. Battery must be minimum of 8 AH rating and capable of starting warm engine. Recoil starter and flywheel starter cone optional. Starter support bracket P\N 557119 is optional.

717.4: Air filter must be Green Brand 40 X 75 filter.

717.5 : Spark plug: Any commercially available, 10 mm thread, spark plug allowed. Spark plug must be stock. Indexing washers allowed. Removal of factory sealing washer is not allowed unless using head temp sensor ring.

717.6: Fuel pump must be B&S part 557033. Must be pulsed from intake manifold only.

717.7: Clutch: May be engine and/or Jackshaft mounted. May use #219 or #35 sprocket.

717.8: Rev Limiter: Rev limit is 7100 rpm +/- 50 rpm. Rev limiter may be checked at any point in the race program. Rev limit will be checked with a suitable memory capable tachometer attached to the plug lead and the motor accelerated until the rev limiter begins to function. All rev limiters must function within 100 rpm when checked with the same instrument. Each competitor is allowed one courtesy check of the rev limiter with the instrument to be used at the event.

717.9: Fuel: Fuel to be KSUSA approved gasoline with no additional additives. Fuel may be checked by any means. Each competitor is allowed one courtesy check of fuel in his tank with the method to be used at the event. Compliance with the common source will be determined by zeroing a Digitron gas meter in a sample of source gasoline and allowing each competitor deviation of + / -5 points from zero and/or by any Digitron recommended method.

717.9.1: OIL: Any crankcase oil is allowed BUT MUST PASS THE BURN TEST AND/OR THE SNIFFER TEST. (Recommend TIFF Industries Sniffer)

717.10: Carburetor: Stock Walbro PZ carburetor only. No alterations allowed; choke excluded. Carb mount boot Briggs #557130 is required.

717.10.2 : Slide must remain unaltered. **Unaltered** Stock needle marked CDB is required.

717.10.3: Choke assembly is optional and may be removed and shaft holes plugged with silicon. If choke is retained choke lever may be fastened open with spring, rubber band or tie wrap.

717.10.4 : Pilot Jets: 36, 38, 40 are allowed. **No drilling of jets allowed.**

717.10.5: Main Jets: 90, 93, 96, 98, 100, 102 are allowed. **No drilling of jets allowed.**

717.10.6: Venturi measurement

717.10.6.1: Vertical .9902" max

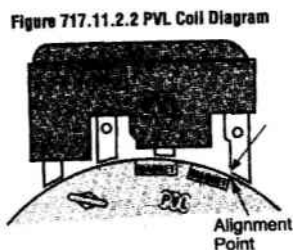
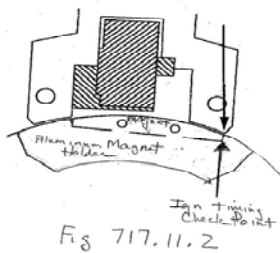
717.10.6.2: Horizontal .7382" max

717.11:Camshaft: **No alteration of the camshaft by machining, polishing, or altering is allowed. Must compare to stock Briggs part.** First camshaft check will be taken at the valve spring retainers. With the lash set at zero, the movement of the valve spring retainer may not exceed .3085".

Any camshaft with a measurement at the push rod of less than .306 should be removed and measured on the grind and checked for alteration. Camshaft must be as supplied with **Stock Profile and** compression relief.

717.11.1: Install degree wheel, using positive stop method.

717.11.2: Check ignition timing. With the right edge of the magnet (not the magnet holder) aligned with the right edge of the notch on the bottom of the right leg of the coil as in Fig. 717.11.2. Check the PVL ignition as illustrated in 117.11.2.2. The degree wheel should indicate between 23 and 29 degrees BTDC for either ignition.



717.11.3: Tech camshaft at pushrods. Push gently down on dial indicator stem to ensure that there is no lash when pushrods are going down.

Exhaust Lobe	Lift	Intake Lobe
75-71 BBDC	.020	34-30 BTDC
57-53 BBDC	.050	18-14 BTDC
39-35 BBDC	.100	2BTDC-2ATDC
25-21 BBDC	.150	13-17 ATDC
9-5 BBDC	.200	29-33 ATDC
12-16 ABDC	.250	49-53 ATDC
25-29 ABDC	.275	63-67 ATDC
.3085 MAX	.3085	
70-66 BTDC	.275	31-28 BBDC
57-53 BTDC	.250	18-14 BBDC
37-33 BTDC	.200	2-6 ABDC
21-17 BTDC	.150	18-22 ABDC
6-2 BTDC	.100	33-37 ABDC
11-15 ATDC	.050	49-53 ABDC
29-33 ATDC	.020	66-70 ABDC

717.12: Deck/Piston Clearance: Machining of deck surface is permitted. There will be no knife edge finishes allowed, Smooth finish only. Piston pop up cannot exceed .035" above block surface in the center of the piston. When measuring piston pop up, use the backside of the Sox pushrod gauge or set flat bar stock across piston parallel to wrist pin. Use dial indicator to check pop up on center of this bar. Carbon may be removed from the top of the piston prior to measuring. Top of piston may be filed to relieve protrusions left by number stamp on top of piston.

717.13: Bore: Maximum bore 2.725". Factory oversize pistons allowed.

717.14: Stroke: Maximum stroke is 2.204". Push piston down to take up rod play.

717.15: Head gasket: Stock B&S head gasket only. .041" minimum thickness between head bolt holes. Measurements are to be made with micrometer from inside of gasket. Fire-ring Gasket P/N 555698 is production item and legal.

717.16: Head: Head may not be altered in any way from factory specifications. Heat sink P/N 555690 is allowed.

717.16.1: Rocker Arms: Must be as produced. Length must be 2.761" minimum to 2.291" maximum.

717.16.2: Rocker Ball: Must be stock. Diameter to be .590" - .610".

717.16.3: Cylinder head gasket surface may be machined. Depth from gasket surface to head surface between valves must be a minimum of .319". Measure by using a depth micrometer. There will be no knife edge finishes allowed, Smooth finish only. No angle milling of the head.

717.16.5: Ports:

717.16.5.1: Intake port: No media blasting of any type allowed on intake port in/on the head or manifold. Must be as cast.

Maximum diagonal measurement is 1.101".

Maximum vertical measurement is 1.044".

717.16.5.2: Exhaust port: No media blasting of any type allowed on exhaust port. Must be as cast.

Maximum I.D. of shoulder in bottom of exhaust port is .854"

717.16.6: Valve seats - one 45° angle only

717.16.6.1: Intake valve seat diameter is .966" - .972".

717.16.6.2: Exhaust valve seat diameter is .844" - .850".

717.16.7: Valves

717.16.7.1: Intake valve head diameter is 1.055" - 1.065".

717.16.7.2: Exhaust valve head diameter is .935" - .945".

717.16.7.3: Valve stem diameter is .232" - .238".

717.16.7.4: Valve face must have one 45° sealing surface only.

717.17.8 Valve springs

717.17.8.1: Dual valve springs as supplied by factory are required.

717.17.8.2: Inner spring wire diameter is .066" - .068".

717.17.8.3: Outer spring wire diameter is .112" - .114".

717.17.8.4: Valve Guides: Replacement of valve guides with B&S factory part 555645, is allowed.

717.18: Ignition: Unaltered B&S stock coil #557040 w/External Limiter or #557125 with Internal RPM Limiter is mandatory. Attachment bolts or bolt holes may not be altered.

717.18.1: Spark plug connector must be stock factory type.

717.18.2: Rubber plug boot is allowed.

717.18.3: There must be resistance from plug wire to ground on coil #557040. Resistance must be between 3000 ohms, minimum, to 6000 ohms, maximum. Coil resistance may be rechecked after a minimum of 10 minutes if correct reading is not attained upon first check. No spec available on PN #557125.

717.18.4: Coil air gap is non tech.

717.19: Flywheel: Only stock Cast Iron or Cast Aluminum Briggs #557126 flywheel is permitted. Starter ring gear and all cooling fins must be in place. No machining, glass beading, sandblasting, painting or coating of flywheel is allowed. **Minimum Flywheel Weight with starter ring, cooling fins, and attachment bolts 4 pounds 3 ozs.**

717.19.1: Chipped fins due to poor casting are legal. Completely broken off fins are not allowed.

717.19.2: Stock flywheel key with B & S logo is required and will determine Aluminum flywheel ignition timing. The flywheel key may be aluminum or steel. NO offset keys permitted.

717.20: One or two stock crankcase gaskets are required.

717.21: Valve Lifters: Must be stock. No Polishing allowed.

717.21.1: Lifter head diameter must be .969" - .972".

717.22: Connecting Rod: Stock B&S part #557005 or 557117 rod only. Rod may not be altered **or polished**. Rod may be clearanced providing that it is in stock configuration and finish, with no dimpling or media blasting. Rod ends must be concentric with crank journal and wrist pin with no chamfer or breaking of edges.

717.22.1: Rod length, measured from bottom of wrist pin hole to top of crank journal hole, is 2.419" minimum to 2.429" maximum.

717.22.2: Oil hole opening is .185" no-go. Crank end of oil hole is chamfered.

717.23: Wrist pin:

717.23.1: Maximum I.D. is .414".

717.23.2: O.D. is .624"-626".

717.23.3: Minimum length is 1.901".

717.24: Piston rings: Three rings mandatory. Top compression ring must have chamfer or O toward top of piston. Second scraper ring must be installed with inside chamfer down and O toward top of piston. Oil ring must be installed as from factory. No alteration of rings allowed except end gapping and lapping. **Maximum RING GAP of Rings .050. Rings must be self supported in the cylinder bore of the engine being inspected. Rings must remain flat.** Rings must be in one piece when removed from block. Aftermarket rings are allowed if they meet the Specifications listed below.

717.24.1: Minimum width of top two rings is .095”.

717.24.2: Thickness of top two rings is .059” - .064”.

717.24.3: Minimum width of oil ring is .065”. Ring groove must be present. Expander must be installed.

717.24.4: Thickness of oil ring is .098” - .102”.

717.25: Piston: Stock “kidney bean” piston required. No alteration, polishing or machining allowed. Only piston skirts are coated and coating can not be removed and skirts or any part of piston be polished. Factory finish only.

717.25.1: Minimum from top of piston to top of wrist pin on circlip side is .658”.

717.25.2: Minimum piston length is 1.768”.

717.25.3: Factory oversize World Formula pistons are allowed.

717.26: Crankshaft: Stock B&S crankshaft casting #772 and #052 only allowed, all finishes to be as factory supplied, with stock timing gear installed in stock location only. No alteration **or polishing** in any manner allowed. Offset crankshafts not permitted. Stock bearings required.

717.26.1: Shim(s) if used, must be installed as from factory.

717.26.2: Crankshaft journal diameter is 1.094” - 1.100”.

717.27: Block: Must be stock with no alterations, except blocks may be repaired from broken rod damage, providing that repair does not constitute a functional modification of original block. No welding is permitted from the cooling fins upward.

717.28 CYB rule: Unless the rules say you can; you can't!!!

717.29 All Tolerances +/- .001 measured with dial indicators, micrometers or calipers due to calibration variance.

Cam Profile

Cam ID	Description	Max valve lift (inches) Int / Exh	Exhaust Profile ID	Exhaust Centerline (Crank Deg)	Exhaust Opens (BBDC)	Exhaust Closes (*BTDC)	Exhaust Duration (Crk Deg)	Intake Profile ID	Intake Centerline (Crank Deg)	Intake Opens (BTDC)	Intake Closes (ABDC)	Intake Duration (Crk Deg)	Centerline Spread (Crank Deg)	Valve Overlap	Comments
Formula 215754 cam Spec	308 with ramps	.308 / .308		249	59	-17	256		467	21	55	256	218	38	Valve data at 1.0 mm (.0394 inches)
Formula 215754 cam Spec	308 with ramps	.308 / .308		249	55	-13	248		467	17	51	248	218	30	Valve data at 0.050 inch (1.27 mm)
The above specifications are with zero lash.															

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