



# 2018 Junior Sprint Rules

## **2018 KidSprint Engine Rules Briggs World Formula 2018B**

All parts must be Briggs & Stratton 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. All tolerances are +/- .001 inch.**

**CYA Rule: If the rules do not say you can - You can't!!!!!!**

**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. Baffle rattle is allowed however if baffles have been altered or removed, the muffler will be deemed illegal. Baffle holes are .128 inch (#30 drill bit) no go gauge. 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:** Air filter must be Green Brand 40 X 75 filter attached directly to Carb. No Extensions or Adapters.

**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:** 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. Belt or chain drive from engine to jackshaft. May use #219 or #35 sprocket.

**717.8: Rev Limiter:** 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: KSUSA FUEL WILL BE METHANOL IN 2018. No additives allowed, i.e. top end lube, Power Mist, propylene oxide, nitro methane, etc. No M5.**

**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. New Carburetor may have different color and exterior appearance.

**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: Needle Jets (nozzle):** Drilling or reaming of gas pilot is allowed to .110.

**717.10.5: Main Jets:** .073 (#48) drill bit Drilling or reaming of jets allowed. .025 Pilot (slow) jet 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. The degree wheel must indicate between 23 and 29 degrees BTDC. Flywheel key must have BS logo. Minimum key width is .182 inch.

**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 MAX

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:** Any commercial available head gasket may be used but must maintain same configuration of shape of standard Briggs World Formula gasket. Minimum thickness is .040 measured with a micrometer from inside of cylinder hole of gasket at 4 points between the head bolts. Fire Ring B&S gasket is legal. **All engines used in 2018 will require the .040 gasket.**

**717.16: Head:** Head may not be altered in any way from factory specifications. NO PORTING OF ANY SHAPE OR WAY! Heat sink P\N 555690 is allowed.

**717.16.05: Cylinder Head Gasket:** Cylinder head gasket surface may be machined. Remove Carbon first. Depth from gasket surface to head surface between valves must be a minimum of .319". Measure by using a depth micrometer. No knife edges or angle milling of head.

**717.16.1: Rocker Arms / Push Rods:** rocker arms must be as produced. Length must be 2.820 inches minimum. Push rod length 5.638" no go to 5.656 must go. Push rod diameter is .185 to .190".

**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 P\N #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 oz.

**717.19.1:** Chipped fins due to poor casting are legal. Completely broken off fins are not allowed. Minimum 1.995 inch Flywheel cover opening 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. .182 minimum width. 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 Heads:** Lifter head diameter must be .964" - .984".

**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:** 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 but may be trimmed in overall length.

**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 cannot 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 being 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. Side cover may be peened to retain side cover bearing.

**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.

**CYA rule:** Unless the rules say you can; you can't!!!

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

**General Rules:** Please read the General Rules & Regulations. All drivers and crew are responsible for knowing and following these rules.