

## POWRi Jr Sprint - Engine Rules

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

**DO NOT ASSUME ANY ITEM IS LEGAL BECAUSE SPECIFIC REFERENCE IS NOT MADE!**

1. **Shroud and covers:** All shrouds and covers must be run as supplied. Flywheel cover, top plate are non tech items. Cylinder shield may be trimmed for CHT sensor installation and header flange clearance. Bolts used to secure metal or plastic covers may be replaced with bigger diameter bolts. Breather by-pass (555688) is allowed.
2. **Header and silencer:** RLV 5442S only (coated or non-coated allowed). Header may be cut and turned to fit car as long as the overall length and tube size remains the same as stock factor header: 20.5" .9375" x .065" wall (.807 +/- .005 Any exhaust gasket or you may use sealer. Exhaust gas temp sensor is allowed. RLV Silencer #4100 Required and may be coated. If baffles have been altered or removed, the muffler will be deemed illegal. Baffle rattle is allowed. Baffle holes are .128" no-go gauge. Silencer to header must be safety wired. If Silencer becomes dis-attached from header in race the racer will be DQ'd.
3. **Electric starter:** Starter motor must operational and capable of starting engine.
4. **Air cleaner:** B&S #698973 Green air filter brand 40 x 75. Pre-filter may be used.
5. **Spark plug:** Any commercially available, 10mm thread spark plug allowed. Spark plug must be stock. Indexing washers allowed. If using temp sensor, you may remove sealing washer.
6. **Fuel pump:** B&S #557033 only. Must be pulsed from intake manifold only.
7. **Clutch:** May be on engine or jack shaft mounted. Belt or chain drive from engine to jack shaft. May use #35 or #219 chain.
8. **Rev Limiter:** Rev limit is 7100 rpm +/- 100 rpm. May be checked at any point in race program. Rev limit will be checked with a suitable memory capable tachometer attached to the plug lead and motor accelerated until the rev limiter begins to function. All rev limiters must function within 100 rpm when checked with the same instrument.
9. **Fuel:** Methanol only NO ADDITIVES Use a temperature correction chart to determine specific gravity. VP M3 and M5 and other brands of like fuel are illegal. Any approved test means available may be used.
10. **Oil:** Any crankcase oil is allowed. Must pass oil burn test.
11. **Carburetor, Spacer, Manifold:** Stock Walbro PZ carburetor only, no alteration allowed. Verturi .9902" max and Horizontal .7382" max. Unaltered carburetor spacer only B&S #557130. Unaltered intake manifold and pulse line only B&S #557009
  - a.) Slide must remain unaltered and unaltered needle marked CDB is required.
  - b.) Choke assembly is optional and may be removed and shaft holes plugged with silicon.
  - c.) Jets and Nozzle: pilot jet .026" no-go. Main jet .072" no-go. Nozzle .111" no-go.
12. **Camshaft:** Frist camshaft check will be taken at valve spring retainer. With the lash set at zero, the measurement on 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.
  - a.) Install degree wheel, using positive stop method.
13. **Check ignition timing:** With the left edge of the right coil leg aligned with the right edge of the right magnet, the motor must be from 23 degrees to 29 degrees BTDC. Flywheel key must have B&S logo. Minimum key width is .182".

14. **Tech camshaft at push rod:** Push gently down on dial indicator stem to ensure that there is no lash when push rod are going down.

<u>Exhaust Lobe</u>	<u>Lift</u>	<u>Intake Lobe</u>
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	19-22 ABDC
6-2 BTDC	.100	33-37 ABDC
11-15 ATDC	.050	49-53 ABDC
29-33 ATDC	.020	66-70 ABDC

16. **Push Rods:** Must be stock. Diameter is .185" - .190". Length is 5.638" - 5.656"
17. **Deck/Piston:** Machining of deck surface is permitted. Piston pop-up cannot exceed .035" above block surface in center of the piston. When measuring piston pop-up, it should be accomplished with bar stock on a parallel with the piston wrist pin and using a dial indicator, check the piston pop-up in this area.
18. **Bore:** Max bore 2.725". Factory oversize pistons allowed.
19. **Stroke:** Max stroke is 2.204". Push piston down to take up rod play.
20. **Head gasket:** Any commercially available head gasket may be used but must maintain same configuration of shape of standard B&S "Fire Ring" head gasket. Minimum thickness .040", measured with micrometer from inside cylinder hole of gasket.
21. **Head:** Gasket surface may be machined. Depth from gasket surface to head surface between valves must be a minimum of .319". If gasket surface is machined, the section of the head directly over the piston must be machined to same plane. Hard carbon may be scraped off before measurement is made.
- Rocker Arms: Minimum length to be 2.820"
  - Rocket Arms Studs / Cylinder Head Plate: All must be as produced.
  - Valve Cap: Unaltered valve cap required.
  - Intake port: Maximum diagonal measurement is 1.101" Maximum vertical measurement 1.044"
  - Intake port has a machined chamber where the bottom of the intake port intersects with the bowl cut for the valve seat. Chamber does not reach iron seat.
  - Exhaust port: Maximum I.D. Of shoulder in bottom of exhaust port is .854"
  - Valve seat: one 45 degree angle only.
  - intake valve seat is .972" No-go. Exhaust valve seat .850" No-go.
  - Valves: Intake valve head diameter is 1.055" – 1.065". Exhaust valve head is .935" - .945". Valve stem diameter is .247" +/- .002". Valve face must have one 45 degree sealing surface only. Intake and exhaust valve length is 3.372" +/- .010".  
\*\*\* May use Stainless steel W/F exhaust valve in place of stock B&S exhaust valve\*\*\*
  - Valve spring: Dual valve springs as supplied by B&S are required. Inner spring wire diameter is .066" - .068". Outer spring wire diameter is .112" - .114".
  - Valve guides: Replacement of valve guides with B&S factory parts is allowed.

22. **Ignition:** Unaltered stock B&S PVL #557125 coil is required. PVL flywheel must be used. Attachment bolts must not be altered. Spark plug connector must be stock factory type. Coil airgap is non tech.
23. **PVL Flywheel:** Unaltered from B&S required. a.) Plastic fan and starter ring gear required. b.) Minimum weight is 4 pounds 1 ounce.
24. **Valve lifters:** Must be stock.
  - a.) head diameter must be .964" No – go
  - b.) length of lifter must be 1.515" to 1.525"
25. **Connecting rod:** Stock connecting rod or unmodified series produced aluminum alloy rod that is available to the karting industry is allowed. Must meet stock specs.
  - a.) Rod length, measured from bottom of wrist pin hole to top of crank journal hole is 2.419" minimum to 2.429" maximum. Oil hole opening is .185" no-go.
26. **Wrist pin:** Maximum I.D. Is .414". O.D. Is .624" - .626". Minimum length is 1.901"
27. **Piston rings:** Three rings mandatory. Top compression ring must 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. Rings must be self-supporting in the cylinder bore of engine being inspected. Ends of ring must remain flat. Excessive end gapping of rings is not allowed. Maximum end gap of .050". Rings must be in one piece when removed from block. Aftermarket rings are allowed if they meet the specifications listed below.
  - a.) Minimum width of top two rings is .095"
  - b.) Thickness of top two rings .059" - .064"
  - c.) Minimum width of oil ring is .065" . Thickness of oil ring is .098" - .102". Ring groove must be present. Expander must be installed. End of expander may be clipped.
28. **Piston:** Stock "kidney bean" piston required. Arrow on piston must point to flywheel side.
  - a.) Minimum from top of piston to top of wrist pin .658"
  - b.) Minimum piston length is 1.768"
  - c.) Factory oversize World Formula B&S piston are allowed.
29. **Crankshaft:** Stock B&S crankshaft with stock timing gear installed in stock location only. No alteration in any manner allowed. Offset crankshafts not permitted. Stock bearings required.
  - a.) Shim(s): if used, must be installed as from factory.
  - b.) Crankshaft journal diameter is 1.094" - 1.100"
30. **Block:** Must be stock with no alterations, except block may be repaired from broken rod damage, providing that repair does not constitute a functional modification of original block. No welding is permitted from cooling fins upward.