

### **SECTION 13 - BRIGGS ANIMAL SPECIFICATIONS**

General: All components to be OEM Briggs & Stratton unless otherwise specified. Gaskets and fasteners non-tech unless otherwise specified. Gasket sealer acceptable on all machined surfaces unless otherwise specified. All parts to be stock appearing and are subject to be compared to a known stock Briggs and Stratton part.

- 13.1 Blocks to be OEM and can be repaired for broken rod or other damage providing the repair cannot be considered a performance enhancement. Ball and roller bearings shall be of metallic (magnetic steel) construction (excluding retainers) and be of conventional design. This includes inner and outer races as well as the balls and rollers. No other materials allowed. The repair of both coil post is allowed. (since timing is non tech this method is acceptable.)
- 13.2 Piston pop up .005" max. (Machining of block deck surface allowed to adjust pop up.) When measuring piston pop-up, it should be accomplished with bar stock on parallel with the piston wrist pin and, using a dial indicator check the piston pop-up in this area. Then without moving the dial indicator rotate the bar 90 degrees on the center line of the piston and check the popup it should not exceed 0.005"
- 13.3 Maximum cylinder bore is 2.725" which provides for approx .035" over bore.
- 13.4 OEM crankshafts only with stock factory timing gear. No modifications allowed. Stroke is 2.204" max and crankpin journal diameter min/max is 1.094" - 1.100".
- 13.5 Connecting Rod: Any aluminum connecting rod is permitted. (insert bearing optional) Length from bottom of wrist pin bore to top of crankshaft journal bore 2.419" " minimum, 2.429" maximum. Connecting rod bolts are non-tech. Rod grinding/ clearancing is acceptable providing that it is in an area that needs clearance. Oil hole diameter non-tech.
- 13.6 Pistons: Briggs or Burriss pistons only. Length from top of piston to top of wrist pin bore .655" minimum. Minimum overall piston length is 1.762".
- 13.7 Rings: Three rings are mandatory. Compression (top) ring to have chamfer or dot facing up. Scraper (2<sup>nd</sup>) ring to have the inside chamfer down and dot up. 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. Expander ring must be installed. Oil ring thickness .098" - .102".
- 13.8 Wrist Pin: Must be magnetic steel. .624" to .626" OD, .438" max ID and 1.901" min length.
- 13.9 Crankcase Side Cover: Side-Cover must remain stock OEM item.
- 13.10 Cylinder Head: Stock B&S cylinder head part #555635. Machining of gasket surface only allowed. Depth of head at shallow part of head .011" min. The measurement on the shallow side of the combustion chamber will be taken with a depth gauge on the push rod side of an imaginary line drawn from dowel pin to dowel pin on valve side of the dowel. It will also be taken over the spark plug area. The rest of the recess area in the head has no depth dimension, but the recess must remain visible. Depth at floor of head .319" min. Depth to top of valve seat is .360" max. Head thickness measured from head gasket surface to head plate gasket surface is 2.420". Head thickness to be checked in four places through the valve guides and the push rod holes with gauge. Width of combustion chamber at the

widest part across the valve seats area checked with a 2.640" NO GO at a depth of 0.200" in the combustion chamber.

- 13.10.1 Valve Seats: To be one angle only. Seats are non-tech and be stock appearing. Intake seat inside diameter, .966" GO - .972" No Go. Exhaust seat inside diameter, .844" GO - .850" No Go. Exhaust and intake seat 45 degree angle.
- 13.10.2 Ports: To have stock configuration. No porting or modifications of any kind allowed. 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 port at bottom and stop at upper edge of port on top. 0.864" No Go cannot touch the valve guide of the intake port. .860". Plug gauge will be used as a visual check of the eyebrow area this is not a No Go but a visual assist tool. Exhaust Outlet: .980 No Go.
- 13.10.3 Valve Guides: Valve guides non-tech and to be stock appearing. Maximum depth from cylinder gasket surface to top of valve guide is 1.255.
- 13.11 Head Gasket: OEM or after market head gaskets are allowed. No aluminum or copper head gaskets allowed. .042" Min. thickness measured in four places between head bolts. Measurements to be made with micrometers from inside of gasket.
- 13.12 Cylinder Head Plate: Must be OEM item. Cylinder head plate gasket must be stock configuration. .055" max. thickness.
- 13.13 Rocker Arm studs: To be stock factory item.
- 13.14 Rocker Arm Pivot Ball: Stock factory item. Min/max diameter to be .590" - .610".
- 13.15 Push Rod: Stock factory item. Min/max diameter is .185" - .190". Min/max length is 5.638" - 5.656".
- 13.16 Rocker Arms: Must be stock as from the factory. Minimum overall length is 2.865".
- 13.17 Valve Spring Retainers: Stock OEM item. Min/max thickness is .055" - .075".
- 13.18 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 non-tech. Camshaft lobes must remain flat and of original width. Maximum valve lift of 0.255" taken directly off the valve retainer at zero valve lash. Place dial indicator on valve retainer 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. Set dial indicator to zero and then check lift. When checking the lift off the valve retainer the only dial indicator holder that will be used is three leg holder.

Camshaft Profile Limits		
Intake Degrees	Lift	Exhaust Degrees
18 to 13 BTDC	0.020	61 to 56 BBDC
0 TDC to 4 ATDC	0.050	44 to 40 BBDC
16 to 20 ATDC	0.100	27 to 23 BBDC
33 to 37 ATDC	0.150	11 to 7 BBDC
42 to 46 ATDC	0.175	1 BBDC to 3 ABDC
53 to 57 ATDC	0.200	10 to 14 ABDC
67 to 71 ATDC	0.225	24 to 28 ABDC
Min. Lift	0.252	Min. Lift
Max. Lift	0.257	Max. Lift
39 to 35 BBDC	0.225	78 to 74 BTDC
25 to 21 BBDC	0.200	64 to 60 BTDC
15 to 11 BBDC	0.175	53 to 49 BTDC
5 to 1 BBDC	0.150	43 to 39 BTDC
12 to 16 ABDC	0.100	27 to 23 BTDC
28 to 32 ABDC	0.050	10 to 6 BTDC
44 to 49 ABDC	0.020	5 to 10 ATDC

- 13.19 Valves: Stock valves only and to 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, cross-hatching, etc. Minimum intake and exhaust valve length 3.250".
- 13.19.1 Intake Valve: 45 degree seat face. Valve head min/max diameter is 1.055" - 1.065". Depth of dish in valve .099" - .119".
- 13.19.2 Exhaust Valve: 45 degree seat face. Valve head min/max diameter is .935" - .945". Depth of dish valve .084" - .104".
- 13.20 Intake and Exhaust Spring: Maximum spring length is .930". Min/max wire diameter .103" - .107", measured in three places on spring. Inside diameter of spring .615" minimum, .635" maximum. Must be stock appearing and have 4/4.5 coils.
- 13.21 Valve Lifter: Stock OEM lifter. Head of lifter to have a min/max diameter of .820" - .860". Min/max length of lifter 1.515" - 1.525".
- 13.22 Valve Cover: Stock OEM valve cover, that includes the breather hole for the tube that runs to the catch can (no threading of hole allowed).
- 13.23 Intake Manifold: Stock OEM Animal intake manifold only. No modifications allowed except machining of gasket surface is permitted to meet rule specs. The gasket surface must remain flat for proper gasket seal the intake to head. The intake carburetor mounting holes may be drilled out to 0.328" max, and the width of the intake to carb slotted hole will be checked with the same max dia. Min/max length 1.740" - 1.760. Inside diameter min/max .885" - .905". Intake to block max gasket thickness .070".
- 13.24 Carburetor: PZ Model 22 only. OEM factory carburetor only. Parts inside the float bowl or that can be removed through the float bowl are non-tech. Any 1/4" bolts may be used to attach carburetor to intake. No studs allowed. Carb to intake sealer is by O-Ring only. No

- sealer allowed. Air must enter carb at air horn only. Choke must be stock appearing as from factory except choke maybe secured in open position. Adapter will be allowed on end of fuel inlet of carburetor for attachment of 1/4" fuel line.
- 13.24.1 Throttle Bore: Max diameter is .874" must be as cast.
- 13.24.2 Choke Bore: Max diameter is 1.149" and must be as cast.
- 13.24.3 Venturi: Vertical max width is .792", this measurement shall be made with the No Go held parallel to the bore of the carburetor. Horizontal max width is .615" for top and bottom of venturi (widest part), and .602" max will be the horizontal check for the narrowest part of venturi, and this No Go may not enter slide area. Air pick off hole maximum diameter .061".
- 13.24.4 Throttle Slide: OEM item only. Minimum length top edge of slide to deepest part of cut away 1.142". Alternate method is to check the depth of the cut away on the slide by placing it on a flat surface and attempting to run a .075" No Go pin into the .074" max cut away.
- 13.24.5 Main Jet Metering Rod: Min/max length is 1.677" to 1.692". Taper on needle must not be less than .070" at .500" from the tip.
- 13.25 Air Filter: Air filter is optional and any air cleaner permitted. If air filter is used it must be installed directly to carb and no filter adapter is allowed. 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.
- 13.26 Fuel Pump: Pulse-type fuel pumps allowed. Fuel pump to be externally mounted and has to be pulsed only from the crankcase upper oil fill cap.
- 13.27 Ignition: If JR flywheel is used, the coil must be stock Briggs coil part # 557040 to 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 allowed. Min weight 4 lb 8 oz.
- 13.28 Ignition: If PVL flywheel is used the PVL coil 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. Min weight 4 lb 4 oz.
- 13.29 Flywheel key, coil air gap, spark plug boot and flywheel nut and washer non-tech. Any 14mm commercially available spark plug allowed.
- 13.30 Recoil Starter: Non tech and optional. Any style starter nut is allowed.
- 13.31 Header and Silencer: Exhaust pipe/header must not extend past rear bumper (including silencer, where applicable) and have no exposed sharp edges. Header shall have a maximum length of 24" to be measured in the ID using a .250" wide tape measure. Measurement to be made with silencer off of pipe and tape tight. If any part of the pipe is less than maximum the pipe is legal. Loop header pipes not allowed. Header/exhaust pipe may not protrude inside of exhaust port more than .625". Header to be of fixed design and no slippery 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 the flange to end of pipe with stages or butt welds permitted (no chamber, infusers, or covers of any type allowed on muffler, etc.) A Header support brace and safety wiring of header bolts or

studs is mandatory to assure header bolts remain tight. It is required that the safety wire wrap around pipe to insure that bolts remain with pipe in case they are stripped out of block. Silencer rules per Rule 8.3.

- 13.32 Shrouds and Covers: Engine shroud and covers and control bracket to be intact and stock appearing. The exception is the control cover which can be modified to attach fuel pump (fuel pump must be visible) and throttle bracket also cylinder cover maybe cut for thermal coupler, intake manifold, and exhaust flange clearance. New Briggs & Stratton air shield/guard Part #555680 may replace plastic control cover and control bracket.
- 13.33 Engine Seals: The engine will be sealed with two wires one wire will run between a valve cover bolt and a intake to engine bolt to a the nut side of a carb to intake bolt the other wire seal will seal the front side of the cover bolt.
- 13.34 Clutch: Dry clutches only.