

707 BRIGGS & STRATTON

WORLD FORMULA ENGINE

All parts must be Briggs & Stratton Series 12 Engine Model Number 124335 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 be compared to a known stock Briggs & Stratton part. No reading between the lines. If it is not in the rules, it must remain stock and unaltered. UNLESS OTHERWISE STATED ENGINE WILL BE TECHED AS RACED.

NOTE: Tech tools to be used to inspect part / parts or used in a tech procedure are noted with the part number of tool shown in parenthesis. (Example: (A12)).

707.1 SHROUDS AND COVERS:

All shrouds and covers must be run as supplied. Cylinder shield may be bent slightly around spark plug hole to allow fitting cylinder head temperature lead. Cylinder shield may be trimmed for CHT sensor installation and header flange clearance. Starter recoil must be retained, as produced and intact with NO alterations. Recoil may be rotated. Specifically, the recoil, shroud, etc may not be taped. No means to alter airflow for engine cooling will be allowed. Cylinder shield may be notched to clear gusset on new block (#555687) which is now legal.

707.2 HEADER AND SILENCER

707.2.1

Factory header is required to be run as supplied with factory paint or no paint, may not be repainted, coated, plated, etc. Header must be wrapped with suitable fabric from header flange to the welded-on braces. Tech personnel may require wrapping to be removed at any point in an event. Any exhaust gasket or no exhaust gasket allowed. Sealer allowed on header. Header nuts are not required to be safety wired, however if bolts are used to mount header, they must be safety wired around the header. Bottom braces must be bolted to head. All exhaust must exit from screen end of muffler.

707.2.2

Exhaust gas sensor is not allowed. Exhaust gas sensor fitting is not allowed, even if plugged.

707.2.3

RLV pipe #5447S required. See figure 707.2.4

707.2.4

RLV Silencer #4108 required, 0.1285" NO-GO (Tool number TBA).

707.2.5

Springs attaching silencer to header must be safety wired.

707.2.6

Silencer must be supported by kart frame or bumper. Support must not extend beyond rear bumper.

707.3 ELECTRIC STARTER/BATTERY:

Starter motor may remain on engine. Starter motor must remain complete and intact as delivered. Briggs & Stratton bracket #557119 must be installed on side cover and starter if starter is present. Exception - Starter motor and bracket may be removed only if starter is replaced with an approved cover (Flywheel ring gear must remain). Approved cover is Mike's Kart Stands part #KS06FC. Use of battery for starting is not required. Battery need not be carried on kart. If battery is on kart, it must be of gel or dry cell design. Battery must be securely mounted to frame (no mounting to bumpers or nerf bars). Battery mounting system from Russell Karting, part #IA-X30125905 or equivalent. Battery part # IA-A120900A or equivalent.

707.4 AIR FILTER:

AIR FILTER NOT REQUIRED. Air filter, if used must be Green Brand 40 x 75 filter. Air filter must be installed directly to carburetor. Pre filter may be used, but must not constitute a scoop.

707.5 SPARK PLUG:

Any commercially available, 10 mm thread, spark plug allowed. Spark plug must be of stock configuration. Indexing washers are allowed.

707.6 FUEL PUMP:

Fuel pump must be Briggs & Stratton part 557033. Pump must be pulsed from intake manifold only. Pump must not be altered from stock. Pulse line must be 1/4" only and must not exceed 15" in overall length. Fuel line must be 1/4" only. NO oversized lines or fittings, fuel system parts must be connected by the most direct route possible.

707.7 CLUTCH:

Clutch must be as supplied by Premier. Any Premier springs allowed. May use #219 or #35 sprocket. No additional grooving, dimpling or texturing of shoes or drum allowed.

707.8 REV LIMITER:

RPM 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.

707.9 FUEL:

Fuel to be 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. Each event is encouraged to designate a common source of gasoline for the class. Compliance with the common source will be determined by zeroing a Digatron gas meter in a sample of source gasoline and allowing each competitor deviation of + / -5 points from zero. See Section 502.4 and 751.11 for additional fuel checking procedures.

707.10 CARBURETOR:

Stock Walbro PZ Model 26 carburetor only. No alterations allowed.

707.10.1

Carb bowl overflow must be attached to catch can.

707.10.2

Slide must remain unaltered. Minimum Length: 1.310" measured with dial caliper or 1.309" NO-GO (Tool number TBA). Stock needle marked CDB is required.

707.10.3

Choke lever may be fastened open with spring or rubber band.

707.10.4

Stock, unaltered intake manifold and pulse line fitting only, Briggs & Stratton part #557009.

707.10.5

Stock, unaltered carburetor spacer only, Briggs & Stratton part #557130

707.10.6

VENTURI MEASUREMENTS:

707.10.6.1

Vertical 0.992" max, 0.993" NO-GO (Tool number TBA).

707.11 CAMSHAFT AND IGNITION TIMING:

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 0.303". Camshaft must be as supplied with compression relief.

707.11.1 TIMING:

Flywheel key is required.

707.11.2

Install degree wheel, using positive stop method.

707.11.2.1

Stock 2 legged coil and cast iron flywheel: 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 motor must be from 23° BTDC to 27° BTDC. See Figure 707.11.2.

707.11.2.2

PVL coil and flywheel: With the left edge of the right coil leg aligned with the right edge of the right magnet, the motor must be from 23° BTDC to 27° BTDC. See Fig 707.11.3.

707.11.3 CAM PROFILE:

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

INTAKE LIFT	DEGREES
0.020"	34° BTDC 30° BTDC
0.050"	18° BTDC TO 14° ATDC
0.100"	2° BTDC TO 2° ATDC
0.150"	13° ATDC TO 37° ATDC
0.200"	29° ATDC TO 33° ATDC
0.250"	49° ATDC TO 53° ATDC
0.275"	63° ATDC TO 67° ATDC
MINIMUM LIFT	0.303"
MAXIMUM LIFT	0.3085"
0.275"	31° BBDC TO 28° BBDC
0.250"	18° BBDC TO 14° BBDC
0.200"	2° ABDC TO 6° ABDC
0.150"	18° BBDC TO 22° BBDC
0.100"	33° ABDC TO 37° ABDC
0.050"	49° ABDC TO 53° ABDC

0.020"	66° ABDC TO 70° ABDC
EXHUAUST LIFT	DEGREES
0.020"	75° BBDC TO 71° BBDC
0.050"	57° BBDC TO 53° BBDC
0.100"	39° BBDC TO 35° BBDC
0.150"	25° BBDC TO 21° BBDC
0.200"	9° BBDC TO 5° ABDC
0.250"	12° ABDC TO 16° ABDC
0.275"	25° BC TO 29° ABDC
MINIMUM LIFT	0.303"
MAXIMUM LIFT	0.3085"
0.275"	70° BTDC TO 66° BTDC
0.250"	57° BTDC TO 53° BTDC
0.200"	37° BTDC TO 53° BTDC
0.150"	21° BTDC TO 17° BTDC
0.100"	6° BTDC TO 2° BTDC
0.050"	11° BTDC TO 15° BTDC
0.020"	29° ATDC TO 33° ATDC

707.12 DECK / PISTON CLEARANCE:

Machining of deck surface is permitted. Hard carbon may be scraped from piston crown before measuring pop up. Piston pop-up cannot exceed 0.025" above block surface in the center of the piston. When measuring piston pop up, it should be accomplished with bar stock (A25) on a parallel with the piston wrist pin and, using a dial indicator, check the piston pop-up in this area.

707.13 BORE:

Maximum bore 2.725". Factory oversize pistons allowed.

707.14 STROKE:

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

707.15 HEAD GASKET:

Stock Briggs & Stratton head gasket only. Minimum thickness of 0.049" between head bolt holes. Measurements are to be made with micrometer from inside of gasket.

707.15.1

Briggs & Stratton fire ring head gasket part #555698 allowed. Minimum thickness of 0.042" on the metal fire ring portion of the gasket.

707.16 HEAD:

Head with steel insert at exhaust side front heat bolt area is legal. Cylinder head gasket surface may be machined. Depth from gasket surface to head surface between valves must be a minimum of .319". Hard carbon may be removed for inspection.

707.16.1

Shoulders of Sox tool #AT341 or A30 may not touch head gasket surface when tool is placed into combustion chamber. (Figure 704.20.3)

707.16.2

Replacement of valve guides with Briggs & Stratton factory part 555645 is allowed.

707.17 ROCKER ARMS:

Must be stock as produced. Minimum length is 2.850".

707.17.1 BALL ROCKER:

Must be stock. Diameter to be 0.590" - 0.610" (A16).

707.18 INTAKE PORT:

Maximum diagonal measurement is 1.101". Maximum vertical measurement is 1.044" (Tool number TBA). Intake port has a machined chamfer where the bottom of the intake port intersects with the bowl cut for the valve seat. Chamfer does not reach iron seat. May be checked against a known stock part.

707.19 EXHAUST PORT:

Maximum I.D. of shoulder in bottom of exhaust port is 0.854" NO-GO (Tool number TBA).

707.20 VALVE SEATS:

One 45° angle only

707.20.1

Intake valve seat diameter is 0.966" MUST-GO - 0.972" NO-GO (Tool number TBA). Removal of hard carbon is allowed from seat I.D. for inspection purposes.

707.20.2

Exhaust valve seat diameter is 0.840" MUST-GO - 0.850" NO-GO (Tool number TBA). Removal of hard carbon is allowed from seat I.D. for inspection purposes.

707.21 VALVES:

Valve face must have one 45° sealing surface only. Intake and exhaust valve length is 3.372" + or - 0.010". Valve tip must have right angle to valve stem. (Figure 704.17)

707.21.1

Intake valve head diameter is 1.055" - 1.065". Depth of dish in valve 0.099" – 0.119". Minimum height from angle of valve face to top of valve is 0.057" using gauge (A26) (Check using a depth micrometer from top of valve to the gauge). See Figure 704.17

707.21.2

Exhaust valve head diameter is .935" - .945". Depth of dish in valve 0.084" – 0.104". Minimum height from angle of valve face to top of valve is 0.057" using gauge (A27) (Check using a depth micrometer from top of valve to the gauge). See Figure 704.17

707.21.3

Valve stem diameter is 0.247" +/- 0.0002".

707.22 VALVE SPRINGS:

Dual valve springs as supplied by factory are required.

707.22.1

Inner spring wire diameter is 0.066" - 0.068".

707.22.2

Outer spring wire diameter is 0.112" - 0.114".

707.23 COIL:

Unaltered stock B&S coil and wire or B&S PVL 4 legged coil is legal. PVL coil must be used with PVL flywheel. Attachment bolts must not be altered. Spark plug connector must be stock factory type. Rubber plug boot is allowed. Coil air gap is non tech.

707.23.1 TWO LEG COIL:

For 2 legged coil, there must be resistance from plug wire to ground. 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.

707.23.2 SPARK PLUG WIRE:

Spark plug wire on cast iron flywheel ignition only, may be wrapped to protect from rubbing.

707.24 FLYWHEEL:

Stock cast iron flywheel or Briggs & Stratton PVL flywheel is legal. PVL flywheel must be used with PVL coil. No machining, glass beading, sandblasting, painting or coating of flywheel is allowed. Minimum factory overspray is allowed.

707.24.1 CAST IRON FLYWHEEL:

Chipped fins due to poor casting are legal. Completely broken fins are not allowed. Must be run with starter ring gear attached.

707.24.2 PVL FLYWHEEL:

Stock plastic fan is required. Fan must be attached with 2 shoulder bolts. Must be run with starter ring gear attached. Minimum weight of flywheel with fan and ring gear and attaching bolts is 4 pounds, 3 ounces.

707.24.3 PUSH RODS:

Stock as from factory. 0.185" – 0.190" diameter. Length 5.638" NO-GO – 5.656" MUST-GO (A5).

707.25 CRANKCASE GASKET:

One or two stock crankcase gaskets are required.

707.26 VALVE LIFTERS:

Stock tappets as supplied from factory.

707.26.1 LIFTER HEAD:

Head of lifter 0.953" NO-GO - 0.995" MUST-GO (Tool number TBA)

707.26.2 LIFTER LENGTH:

Length of lifter 1.514" NO-GO – 1.526" MUST-GO (Tool number TBA). If checked with dial caliper 1.515" Min – 1.525 Max.

707.27 CONNECTING ROD:

Stock Briggs & Stratton part #557005 rod only. Rod may not be altered. Rod journals 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. Use of Briggs & Stratton factory supplied Torx head or hex head rod bolts are allowed. Minor clearancing of bottom of cylinder to clear hex head bolts is allowed.

707.27.1 ROD LENGTH:

Rod length, as measured from bottom of wrist pin hole to top of crank journal hole, is 2.419" minimum to 2.429" maximum measured with dial caliper at narrowest point on jaws.

707.27.2 OIL HOLE OPENING:

Oil hole opening is 0.185" NO-GO. Crank end of oil hole is chamfered.

707.28 WRIST PIN:**707.28.1**

Maximum I.D. is 0.414".

707.28.2

O.D. is 0.624"-0.626".

707.28.3

Minimum length is 1.901".

707.29 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. Rings must be self supporting in the cylinder bore of the engine being inspected. Ends of ring must remain flat. Excessive end gapping of rings is not allowed. Maximum end gap of 0.050". Rings must conform to all listed factory specifications and be of stock configuration. Known, standards for piston/ring configurations are Briggs & Stratton factory approved parts. No alteration of rings allowed. Except lapping and end gapping. Rings must be in one piece when removed from block.

707.29.1

Minimum width of top two rings is 0.095".

707.29.2

Thickness of top two rings is 0.059" - 0.064".

707.29.3

Minimum width of oil ring is 0.065". Ring groove must be present. Expander must be installed. Ends of expander may be clipped.

707.29.4

Thickness of oil ring is 0.098" - 0.102".

707.30 PISTON:

Stock "kidney bean" piston required, No additional machining or lightening allowed. Arrow on piston must point toward flywheel.

707.30.1

Minimum from top of piston to top of wrist pin is 0.658".

707.30.2

Minimum piston length is 1.768".

707.30.3

Briggs & Stratton oversize World Formula pistons are allowed.

707.31 CRANKSHAFT:

Stock Briggs & Stratton crankshaft with stock timing gear installed in stock location only. No alteration in any manner allowed. Offset crankshafts are not permitted. Stock bearings required. No ceramic bearings allowed.

707.31.1

Shim(s) if used (Briggs & Stratton #555652), must be installed as from factory.

707.31.2

Crankshaft journal diameter is 1.094" - 1.100".

707.32 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.

707.33 FUEL LINES:

Only conventional karting fuel hose allowed. Fuel hose must be run by the most direct route with no excessive length. Hose must properly fit nipple on fuel pump and nipple on carb (slip fit by minimal effort). Nipple on carb - .315" diameter (.316" diameter gauge must go on). Nipple on fuel pump - .324" diameter (.325" diameter gauge must go on). Nipple on carb is .125" NO-GO internal diameter. Fuel hose must be secured at all connection points by approved fasteners such as safety wire, hose clamp or tie wrap. Fuel filters are allowed between the fuel pump nipple and the carb nipple.