

# 701 BRIGGS & STRATTON STOCK RAPTOR 5 HP ENGINE

**NOTE:** All parts must be Briggs & Stratton Series 13 factory production parts unless otherwise specified in this manual. No machining or alteration of parts is permitted unless specifically noted. All parts are subject to be compared to a known stock Briggs & Stratton part. No reading between the lines. If it not in the rules, it must remain, stock. No titanium parts allowed. UNLESS OTHERWISE STATED ENGINE WILL BE TECHED AS RACED.

**NOTE:** Tech tools to be used to inspect part / parts or in a tech procedure are noted with the part number of tool shown in parenthesis. (Example: (B12)).

## 701.1 SHROUDS & COVERS:

Stock engine shrouds and covers must be intact and not modified. Mounting holes may be repaired. Scatter Shroud made by W. E. Chapps may be used. This includes flywheel shroud unless there are no holes in block for it to be used. Tape on shroud housing is allowed. Tape on block is disallowed. Flywheel guard is mandatory. Flywheel guard must be bolted to blower housing, NO revolving screens allowed. Taping of flywheel guard allowed. NO part of Flywheel guard may protrude inside of the flat plane of the blower housing. Any bolt utilized to secure sheet metal, shrouding, etc., with the exception of sheet metal secured by the head bolts, may be replaced with larger diameter bolt(s).

## 701.2 HEADER/SILENCER:

Exhaust pipe/header must extend beyond gas tank but not extend past rear bumper (including silencer, where applicable) and have no exposed sharp edges. Loop Header pipes MUST be wrapped to protect driver from burns. Header/exhaust pipe MAY NOT PROTRUDE inside of exhaust port so as to alter port configuration for performance gain. Studs allowed for header pipe attachment to block.

**NOTE:** In events where silencing device is MANDATORY (Divisional, National, etc., points event and where required for non-points, local events), use of RLV B91 SILENCER IS MANDATORY. Silencer must be utilized as produced, with no modifications or alterations permitted.

### 701.2.1

Gasket and/or silicone are allowed to seal the header.

### 701.2.2

Header must be of fixed design. NO SLIPPY PIPES allowed. No extra tubes or holes allowed in header except a hole for EGT sensor. If EGT sensor hole is present, sensor must be in place or hole must be plugged.

### 701.2.3

Extra heat shield: Extra heat shield above chain guard is allowed.

### 701.2.4

All header pipes must be of continuous length from 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 must be tight, secure, and completely intact on the header through out the entire event. Silencer must be clamped to header tube and no welding of silencer in any area. Silencer must be visible when viewed from any angle. Header tube and silencer only legal parts.

### 701.2.5

The use of exhaust block saver is allowed. It must be round with a 0.75" min. and 1" maximum thickness, and be made of ALUMINUM. Must have a straight bore with a 1.005" (B14) MUST-GO ID. Bolts holes must have stock cord diameter.

### 701.2.6

Silencer Baffle holes 0.1285" NO-GO maximum all baffles.

### 701.2.7

The flange that bolts the header to the block cannot be thicker than .312" Max.

## 701.3 AIR FILTER:

Any air cleaner permitted that is installed in a safe manner. 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. (No open areas allowed)

## 701.4 FUEL TANK:

Tank cap MUST be stock, and in the stock position, Briggs & Stratton domed cap with single vent hole and stock gasket or old style cap with metal insert (See Figure 701.4). Cap splash shields are not permitted. Brace on tank bracket IS permitted No overflow tube is allowed. Bungee-type strap may be used in ALL CLASSES to wrap-around engine and fuel tank to prevent loosening of parts from vibration. One or two gaskets are allowed at the carburetor/tank joint. Only one gasket allowed carb to tank when Blue Print-O-Seal is used. Tank repair kit may be used in pick-up cup of fuel tank; however an open slot (min. distance of 0.062" (B8)) MUST GO and must be visible at the top of the pick-up cup. (See Figure 701.4).

**NOTE:** INSTALLATION INSTRUCTIONS FOR TANK REPAIR KIT: (See Figure 701.4)

CAUTION: Fuel cup insert may have sharp edges. Handle with care.

1. Remove fuel tank from engine and remove old gasket.
2. Roll fuel cup insert into a coil 1" in diameter or less, with tab on outside of coil and insert into the fuel cup in tank, Figure #1.
3. Tab should rest against edge of fuel cup. Push on insert at both sides of seam until seams butt against each other, Fig #2.
4. Reinstall tank and new gasket on engine.

## 701.5 FILTER ADAPTER:

Filter adapter may not be funneled or tapered. Top of filter adapter must be flat. Adapter may not be run without an air filter. No sealer between carb and filter adapter allowed.

### 701.5.1

Adapter may have rolled edge not to exceed 0.250" from top.

### 701.5.2

Maximum thickness of filter adapter is 0.250" (B101), measured from the top of filter adapter to carb air horn mating surface.

### **701.5.3**

One Briggs & Stratton stock gasket may be used under filter adapter, maximum thickness 0.075".

### **701.5.4**

The air intake hole of the air filter adapter must be concentric with the air intake hole in the carburetor and concentric with the outside diameter of the air filter adapter.

## **701.6 CARBURETOR:**

Allen bolts may be utilized to attach carburetor to block, NO STUDS ALLOWED. Any attempt to bypass, gasket, bolts or bolt holes is prohibited. One or two intake gaskets allowed between carb and block mating surface. Thickness of one gasket or the combined thickness of two gaskets not to exceed 0.135" No sealer allowed. Only one intake gasket allowed when Blue Print-O-Seal is used. Carburetor swirl insert may be left in place or removed. If installed, swirl must be in stock position and cannot be altered. Swirl is subject to removal for technical inspection. Air must enter carb at air horn ONLY. (See figure 701.6).

### **701.6.1 RESTRICTOR PLATES:**

Must be stock as manufactured, NO ALTERATIONS ALLOWED. Purple plate 0.425" NO-GO (B12), Gold plate 0.575" NO-GO (B12), Turquoise plate 0.500" NO-GO (B15). Restrictor plate must be flat and sealed within gasket area, and have one gasket only on each side of restrictor plate. Addition of material or funneling of gasket(s) not allowed. Minimum inside diameter of gasket(s) is 0.790" Any attempt to bypass, modify restrictor is prohibited. Anodizing may not be removed from restrictor plate. Horstman or APS lettering must be present, and must be in the up position as raced. Intake restrictors are to be unaltered, and must be as originally manufactured. Along with WKA Tech NO-GO gauges, WKA officials may use a known factory plate, or any other tool necessary to determine legality of part. Restrictor plate violations subject competitor to disqualification and suspension.

**Note: Use of WKA issued restrictor plates may be required at selected divisional events.**

### **701.6.2**

Maximum carburetor bore inside dimension is 0.695" NO-GO (B6) and this dimension includes the entire length of the carburetor bore. With the 0.696" NO-GO (B6) in the backside of the carb, it cannot hit the butterfly when opened. The carb bore is from the recess on the flange end (end that bolts to block) of the carb to the backside of the throttle shaft. Check with plug gauge from the backside of the carb.

**NOTE: Use plug gauge (B100) as a guideline to check radius where air horn meets carb throat. This plug gauge is not a NO-GO gauge. The venturi is from the throttle shaft rearward and cannot be altered. (See Figure 701.6.2)**

### **701.6.3**

Diaphragm side CANNOT be used to create a pressure fuel feed. Diaphragm side of carburetor parts MUST be installed as supplied from the factory. Diaphragm cover plate MAY be surfaced to ensure a proper seal. No silicone or other material may be applied to diaphragm side of gaskets. Aftermarket diaphragms, (including Teflon pumper diaphragm), allowed as long as it is of similar material and configuration of Briggs & Stratton diaphragm. Spring and /or cap cannot be altered.

### **701.6.4**

Slotted end of mixture screw is a non-tech item. All other parts of the mixture screw must be stock as from the factory, including rubber O-ring and washer.

### **701.6.5**

Jets must have stock recess on backside, and the hole may be drilled to any size, but configuration must remain stock. Jets with smaller slots allowed. NO FLAT BACK JETS ALLOWED. No recessing, funneling or oblonging of any holes permitted from front or backside of the jet.

### **701.6.6**

No drilling of any holes anywhere in carburetor.

### **701.6.7**

Main Metering Hole: 0.062 NO-GO (B8).

### **701.6.8 IDLE HOLE:**

0.028 NO-GO (B8).

### **701.6.9**

Where butterfly mates with throttle shaft, it shall have a minimum dimension of 0.059". No modification to butterfly or any portion of the air passageway other than carburetor bore is allowed.

### **701.6.10**

Butterfly screw: Butterfly screw minimum length of butterfly screw is 0.322". Butterfly screw cannot be altered.

### **701.6.11**

Rubber seal must be in proper location in carb body for air seal around throttle shaft. Seal may be stock or aftermarket. If there is not a recess in the carb body (older carbs) for the rubber seal the rubber seal is not a tech item. The felt/foam washer on throttle shaft is optional.

### **701.6.12**

Stop-arm on throttle shaft is not a tech item. Arm may be bent, filed or cut. The remainder of the throttle shaft must be unaltered. Throttle shaft measurement on the back edge must be 0.086" minimum. Front edge must be 0.040" minimum, machined recess-backside minimum 0.030" (B23). Surface may be machined to spec but component must retain stock configuration. Use Micrometer as NO-GO. Set micrometer at 0.086" and if any part of the backside enters, throttle shaft is illegal, then set micrometer at 0.040" and if any part of the leading edge enters, the throttle shaft is illegal. Carburetor linkage tech stops at the throttle shaft. Bell crank and link to shaft are non-tech items. The throttle shaft hole in the body of the carb cannot be moved and should be checked with gauge (B100A)

**701.6.13**

Diameter of carb recess from flange to throttle bore is 0.726" maximum for entire length, and must remain stock as cast. The depth of the recess should be checked with gage (B103).

**701.6.14 AIR HORN:**

Maximum dimension is 1.011" NO-GO (B11).NO-GO area is machined area at or below breather hole. (See Figure 701.6.14)

**701.6.15**

If choke is retained, it must remain stock and complete.

**701.6.16**

No long brass pick-up tube allowed. Screens on either pickup tube on stock carburetor are not tech items. Short tube maximum size is 0.066" NO-GO (B8) to be checked with #51 drill blank. NO\_GO cannot pass completely through tube when checked from either end.

**701.6.17**

Breather tube must be removed from carburetor. The hole in the carburetor may be plugged.

**701.6.18**

No Rifling, metering hole protrusions, dimpling, etc. permitted.

**701.6.19**

A tab to reinforce a broken tank bolt ear on the carburetor-to-tank flange of carburetor is allowed.

**701.6.20**

Entirety of carburetor casting will remain stock. No aftermarket coatings are permitted.

**701.6.21**

Remote mechanical carburetor adjusters are legal in all classes.

**701.6.22**

Holes left after removal of choke and threaded hole at floor of air horn may or may not be plugged so long as plugging does not protrude into air-horn area.

**701.6.23**

The hole in some of the new carburetors located in the boss used on stock carburetors for the governor linkage must be plugged (if the hole breaks through into the bore) and the material used to plug the hole must not protrude into the bore of the carburetor. See Figure 701.6.23 for the location of the boss.

**701.6.24 FLANGE:**

Top flange – minimum 0.270". Bottom flange – minimum 0.235".

**701.7 HEAD BOLTS:**

Any stock head bolt may be utilized and eight are mandatory. Head bolts with stud allowed.

**701.8 CYLINDER HEAD:**

Stock Briggs & Stratton 5HP or Burriss Racing BSF-301-00 cylinder head allowed. Machining of gasket surface and post metal bosses on top of cylinder head are permitted. No machining of any other portion of the head is permitted. Bead blasting or sand blasting of head is allowed. Coils or threaded insert is allowed providing spark plug is located in original position and no protrusion of insert into chamber occurs. Three planes of head interior surface (See Figure 701.8) are subject to check by depth-gauge to establish their proximity to gasket-area surface. Carbon build-up on the head that cannot be readily wiped-off with a dry cloth will be considered part of the head for tech measurement purposes.

**701.8.1**

In the flat area above the piston 0.011" Minimum.

**701.8.2**

Spark Plug area 0.408" Minimum.

**701.8.3**

In the area above valves opposite cylinder bore area 0.300".min. Max depth of deepest valve contact point 0.315".

**701.8.4**

Cylinder head bolt holes 0.3480" (B17) maximum.

**701.9 HEAD GASKET:**

Briggs & Stratton production head gaskets are approved and aftermarket gaskets of general stock design (accommodates all head bolts, follows general stock pattern; does not extend to form "heat sink," etc.) are acceptable. Gasket sealer must NOT be utilized on head gasket. NO Aluminum or Copper gaskets allowed. (See Figure 701.9)

### **701.9.1**

Head gasket must be a minimum of 0.043" thickness at four points between head bolt holes, front, rear and both sides.

### **701.10 BREATHER VALVE:**

Stock breather chamber. Valve must be unaltered. Foam is not a tech item. Tech will include complete breather valve assembly including the grommet. Two breather valve chamber gaskets are allowed. Either Briggs breather part number 555073 or the newer breather 791779 both are legal parts. (See Figure 701.10)

### **701.11 VALVES:**

Stock valves ONLY. No Stellite type valve allowed as found in industrial style engines. Must be one angle ONLY. Valves may not be polished or lightened. If working area (that portion of the valve stem in contact with the valve guide area) of valve stem is cleaned, no material may be removed, such as linear grooves, cross-hatching, etc. (See Figure 701.11)

#### **701.11.1**

Intake Valve: 30 degrees (B24). Intake valve minimum diameter is 1.115" NO-GO (B9).

#### **701.11.2 EXHAUST VALVE:**

45 degrees. Exhaust valve minimum diameter is 0.990" NO-GO (B9).

#### **701.11.3**

Minimum thickness of valves between top (flat area) and seating surface to be minimum 0.035" (no "knife edging" of valve allowed.) Valves will be checked with a gauge for head thickness and legality will be determined by that gauge (B22).

### **701.12 VALVE SPRINGS / RETAINERS:**

Exhaust springs may be used on both intake and exhaust, but must meet all stock specs. Metal may be removed from both ends of valve spring to allow spring to comply with No-Go gauge of valve spring. Back facing of upper portion of valve chamber to stabilize valve spring retainers and prevent spring bind is allowed. Maximum exhaust valve spring length is 1.500" MUST GO (B4) and a minimum length of 1.300" NO-GO. Minimum 0.088" wire diameter max. 0.093" measured in three places. Inside diameter of spring 0.625" minimum, 0.640" maximum.

#### **701.12.1**

If intake spring (on intake only) is used it must measure a maximum of 1.240" MUST GO (B4) in length. With a maximum of 0.087" wire diameter, measured in three places on spring.

#### **701.12.2 UPPER RETAINER:**

Any upper retainer up to a maximum of 0.058" is allowed.

### **701.13 VALVE SEATS:**

Valve seats must meet stock specs, and can be replaced. Seats must have one angle only, 30 degree intake and 45 degree exhaust. Seats MAY NOT PROTRUDE above block casting or deck surface. PIN PUNCHING may be used to tighten a loose valve seat. No more than eight approx. evenly spaced pin punches per valve seat (see Figure 701.13 for location and placement of pin punches). When re-facing valve seats it must be understood that if the tool for checking valve seat height enters valve seat, legality will be determined by that gauge.

#### **701.13.1**

Intake seat inside diameter, max. 1.004" NO-GO (B1).

#### **701.13.2**

Intake seat maximum thickness 0.215". Minimum thickness 0.199".

#### **701.13.3**

Exhaust seat inside diameter, max. 0.880" NO-GO (B4).

#### **701.13.4**

Exhaust seat maximum thickness 0.215". Minimum thickness 0.199".

### **701.14 CYLINDER BORE:**

No circular or machined grooving of cylinder is allowed in any position of cylinder. (See Figure 701.14.1).

#### **701.14.1**

Stock cylinder bore is 2.5625" NO-GO (B7) and overbore is permitted providing it does not exceed 2.620" (approximately 0.050" overbore). (See Figure 701.14.1)

### **701.15 DECK/PISTON CLEARANCE:**

Machining of deck surface is permitted. Piston pop-up CANNOT exceed a Maximum of 0.005" above block surface in either the center or the front of the piston. When measuring piston pop-up, it should be accomplished with bar stock (B5) on a parallel with the piston wrist pin in center of the piston, and using a dial indicator check the piston pop-up in this area. To assure block gasket mating surface is not peak cut, place bar stock (B5) across front of piston, and using a dial indicator check the piston pop-up in this area. The piston pop-up cannot exceed a Maximum of 0.005" (See Figure 701.15). Carbon build-up on piston that cannot be readily wiped off with dry cloth, will be considered part of the piston for tech measurement. Decking of block cannot extend into the aluminum at rear of block (top of fin.) (See Figure 701.15)

**DEGREES**

7° BTDC TO 0° TDC  
 10° ATDC TO 17° ATDC  
 29° ATDC TO 36° ATDC  
 55° ATDC TO 64° ATDC  
 Max Lift is 0.233"  
 43° BBDC TO 33° BBDC  
 13° BBDC TO 6° BBDC  
 6° ABDC TO 13° ABDC  
 23° ABDC TO 31° ABDC

**DEGREES**

38° BBDC TO 33° BBDC  
 23° BBDC TO 13° BBDC

**701.16 CAMSHAFT:**

All cam profile readings must be taken with zero valve lash and degree wheel at top dead center (TDC) of compression stroke. Set dial indicator at zero and do not reset during the profile process. Ground cams are allowed but must meet all Briggs & Stratton factory specs and alignment. Camshafts blanks that have been center drilled from the factory are legal. The camshaft lobes must remain flat and of original width. Maximum camshaft base circle is 0.770". (See Figure 701.17)

**701.16.1 CAMSHAFT PROFILE LIMITS:**

EZ-SPIN LIFT BASE: 0.013" minimum, 0.019" maximum width, 0.001" maximum drop during the 30° duration time. EZ spin is on intake lobe

EXAMPLE: If EZ-Spin starts at 0.015", it may drop to 0.014" and move around between 0.014" and 0.015", but not go above 0.015". Second example: if EZ-Spin starts at 0.015" and rises to 0.016", it may move around between 0.015" and 0.016", but not fall below 0.015". AT NO TIME CAN THE EZ-SPIN OR THE 0.001"

TRAVEL GO ABOVE 0.019" OR BELOW 0.013".

**NOTE:** All cam profile readings must be taken with zero (0) valve lash. When checking cam profile, rotate engine in the normal running direction only. Valves should have no clearance and no spring tension when checked.

**701.17 IGNITION:**

Briggs & Stratton factory stock coils are MANDATORY and must be utilized in unaltered form (see photo). NO slotting of mounting holes or machining of attaching bolts is permitted. New-style composite ignition is allowed. There must be resistance from ground to the spark plug end of the plug wire. SPARK PLUG CONNECTOR must be stock factory type. Rubber plug boot is allowed. May be run with or without air vane. (See Figure 701.18)

**701.18 STARTER:**

New style recoil starter may be retained as produced and intact, however, if new style recoil is removed, starter cup must also be removed. Old style recoil starter must be removed. Crankshaft may be cut-off to facilitate any style nut and use of electric starter.

**701.19 FLYWHEEL:**

ONLY stock, 5HP flywheel is permitted. New Briggs & Stratton flywheel part # 555657 with machined backside allowed. If new flywheel is used the ignition may be spaced out on coil post New flywheel part # 555657 is a legal flywheel. Any flywheel key or NO flywheel key is allowed. Painting and coating of the flywheel (other than minimal factory over-spray) is not permitted. No machining, glass beading or sandblasting of flywheel is allowed. Chipped fins because of poor casting are allowable, however, completely broken fins are NOT allowed. Flywheel washer must be stock.

**701.19.1 FLYWHEEL WEIGHT:**

Flywheel shall be a minimum of 6 lbs. 4 ozs..

**701.20 CRANKCASE SIDE COVER:**

Either Briggs & Stratton or Burris Racing side cover (BSF-107-00) are allowed. Side cover must remain stock EXCEPT block and side cover may be pin-punched to help prevent side cover gasket failure. Stub for governor may be removed and hole plugged to prevent leakage. Aftermarket gaskets are approved. However, they must be of same size as stock gasket(s). Up to three crankcase gaskets are allowed up to a maximum thickness of 0.045"

**701.21 VALVE LIFTERS:**

No extended or adjustable lifters allowed. Aftermarket lifters are allowed, and must meet stock configurations and all stock specifications. No titanium lifters allowed.

**701.21.1**

Head of lifter have a minimum 0.982" diameter, 1.005" diameter maximum.

**701.21.2**

Maximum length of lifter 1.606".

**701.21.3**

Stock Configuration of lifters will be checked with a gauge (B21) and stock configuration legality will be determined by that gauge. (See figure 701.22.3a & 701.22.3b).

**701.22 VALVE SEAT HEIGHT:**

Install a 0.500" rod in place of the cam and replace side cover. Measure through the valve guide from top edge of 0.500 rod to the top of the surface of the intake or exhaust valve seat. Minimum 5.485" / Maximum 5.520" (B19). Aluminum may be removed from top of seat to check seat height. Lifter bore and valve guide bore must accept seat height gage rod.

**701.23 CONNECTING ROD:**

Connecting rod may not be lighter in weight than known stock component. No 0.020 undersize rods allowed. No under-sizing of connecting rod is permitted, however, 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 crankshaft journal and/or wrist pin with no chamfer or breaking of edges. Raptor III rod & dipper is legal; Dipper on Raptor III rod may be broken, however it must be a natural break with no grinding, polishing, or bead blasting visible. Old style rod (aftermarket dipper) is a non-tech item. (See Figure 701.24)

### **701.23.1**

Stock rod length is 3.120" minimum, 3.1333" maximum. Measured from bottom of wrist pin to top of crankshaft journal.

### **701.23.2**

Oil hole opening, Raptor 3 or old style rod, is 0.185" NO-GO (B16).

### **701.23.3 APPROVED RODS:**

ARC Rod Part #6328, #6330, #6348, #6350; CKI Part #3875; Horstman Rod Part #H-498100, #H-498101, #498105; Rix Rockets/Ebert Part #3.875; WMS Rod Part # 7070, Part # 7575 are the only approved aftermarket rods legal for stock classes. No polishing of rods allowed. Steel 0.250" rod bolts only. Minimum total rod weight 135, grams. Minimum rod weight less insert 113 grams. Minimum insert weight 22 grams.

## **RAPTOR WRIST PIN SPECS**

### **701.24 WRIST PIN:**

Wrist pin must not be altered.

#### **• 701.24.1**

Maximum inside dimension of wrist pin is 0.320".

#### **701.24.2**

Maximum outside dimension is 0.490".

## **RAPTOR III WRIST PIN SPECS**

### **701.24.3**

Maximum inside dimension of wrist pin is 0.320".

### **701.24.4**

Maximum outside dimension is 0.490".

### **701.24.5**

Length 1.715" minimum.

### **701.25 RINGS:**

Three rings are MANDATORY. Compression, or top ring, if chamfered, may have either a beveled or chamfered inside face, and must remain as manufactured. Scraper or second ring may only have an external circumference relief area. Ends of ring must remain flat. Mandrel check is no longer required. New factory rings from Briggs & Stratton without bevel on top ring and with relief around circumference of second ring are permitted. Excessive end gapping of rings not allowed. New style, beveled top compression ring (factory produced) is approved. 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 machining of rings allowed. Exception; lapping and end gapping allowed. Shrinking of oil ring and low-tension ring allowed. Rings must be in one piece when removed from block, with the exception of the Raptor III oil ring, all broken pieces must be present in the ring land. If not, the ring will be illegal.

## **RAPTOR RING SPECS**

### **701.25.1**

Top two rings, 0.105" minimum width (for wear).

### **701.25.2 OIL RING:**

Oil ring must have minimum 0.085" width (for wear). Groove and six oil relief slots MUST be present on oil ring Groove must measure 0.083" minimum, regardless of condition of ring.

### **701.25.3**

End gap with rings compressed on ring gauge cannot exceed 0.500" when checked on ring gage (B7).

### **701.25.4**

Top ring cannot exceed standard Briggs & Stratton ring land width of 0.084" maximum.

## **RAPTOR III RINGS SPECS**

### **701.25.5**

Minimum width top two rings 0.090".

### **701.25.6**

Overall thickness top two rings 0.058" + OR - 0.005". The step of second ring is 0.035" min. (Figure 701.25.6)

### **701.25.7**

Oil ring minimum width 0.070", ring groove must be present.

### **701.25.8**

Oil ring Thickness 0.100" + OR - 0.005".

## **RAPTOR PISTON SPECS**

### **701.26 PISTON:**

Stock Briggs & Stratton piston or aftermarket piston meeting stock Briggs & Stratton specifications are allowed. No excessive cleaning of top or skirt of piston allowed. Wrist Pin hole may not be relocated, minimum honing of wrist pin hole allowed. No machining is allowed on piston.

#### **701.26.1**

From top of piston to wrist pin bore 0.937" minimum measurement.

#### **701.26.2**

Minimum piston length is 1.869".

## **RAPTOR III PISTON SPECS**

#### **701.26.3**

From top of piston to wrist pin bore 0.937" minimum measurement.

#### **701.26.4**

Minimum piston length is 1.671".

#### **701.26.5**

Top two-ring land width 0.0603" - 0.0612".

#### **701.26.6**

Oil ring land width 0.1020" - 0.1032".

### **701.27 CRANKSHAFT:**

Stock factory crankshaft mandatory. Stock factory timing gear mandatory, and must be installed properly. Lightening, polishing of counter weights, addition of metal or other material is not permitted. Hardening of stock crankshaft is permitted in all classes to reduce premature journal wear. The power takeoff journal of a sleeve-bearing crankshaft may be machined (turned-down concentrically) to permit its use in a ball bearing block. Offset crankshafts are not permitted. Aftermarket bearing of non self-aligning type, with or without shield, is permitted. NO STROKER CRANKSHAFTS ALLOWED. (See Figure 701.28)

#### **701.27.1**

Minimum crankshaft journal diameter is 0.990".

#### **701.27.2**

Crankshaft may be clearanced to a minimum dimension of 0.775" to permit easier removal of the bearing.

#### **701.27.3 STROKE:**

Stock stroke is 2.4370", plus 0.007" or minus 0.010" for wear. Check with stroke pin (B3) or dial indicator. Stroke is checked by pushing piston down to take up play of rod clearance. Stroke is checked from bottom dead center (BDC) to top dead center (TDC). (See Figure 701.16)

### **701.28 PORTS:**

Porting Allowed. Ports surfaces are non-visual tech item. NO ADDITION OF MATERIAL ALLOWED. Block MAY NOT be machined or altered on intake or exhaust port "gasket mating" surfaces. NO GRINDING is allowed on underside of valve seat. No HOLES in ports allowed. If port is pin-punched, it may not be done in a manner to prevent entry of a NO-GO into port area. (See Figure 701.29)

#### **701.28.1**

Intake port 0.880" NO-GO (B1).

#### **701.28.2**

Exhaust port 1.005" NO-GO (B14).

### **701.29 BLOCK:**

Must be as produced, with no alterations or reworking, except block that has been relieved for rod clearance in Super Stock class or Briggs Controlled Stock may also be utilized in Stock 5HP classes (with stock rod). Blocks repaired from broken rod damage, cracked lifter area, etc., are permitted providing that repair does not constitute a functional modification of original block. Porting of intake and exhaust ports allowed, block may NOT be machined on intake or exhaust ports gasket mating surface (See Figure 701.29). No Peak Cutting of deck allowed. No bushings of any kind allowed except for bushings approved in this Tech Manual. DU Bearing may be installed in conventional block on flywheel side. Extra oil hole, 1/8" in diameter, may be drilled on flywheel side of block at crankshaft bushing to better lubricate crankshaft (applicable to all classes). Sleeving of cylinder block is permitted in all Briggs & Stratton engine classes. Regular ferrous sleeves only, with no coatings or plating, such as Nicasil, allowed. The repair of one coil post is allowed, as long as the remaining post is factory and unaltered. Valve guides may be replaced. Aftermarket valve brass or bronze guides allowed as long as they meet stock requirements. Valve guides may be stacked. No KNUURLING of guides allowed. Minor grinding of block behind seal in a double bearing block where crank goes through block is allowed (to prevent crank from seizing). Chamfering at bottom of lifter bore for clearance purposes only allowed. Diameter of chamfer cannot exceed 0.500. Chamfer of Lifter bore will be teched with a no-go gauge, which measures 0.505 (B20). This applies to stock blocks and blocks that have been welded for strengthening purposes. No Undercutting of lifter bore permitted.

### **701.30 WELDING:**

No welding can be done to an engine from the cooling fins upwards except minor welding to lower exhaust bolt hole is allowed for repair (weld cannot protrude into exhaust port). The only welding permitted is to repair damage from a broken rod or cracked lifter bore. Welding of lifter bore for reinforcement or breakage allowed. Installation of bushing guide to help reinforce lifter bore area allowed. (See Figure 701.30)