

Name: \_\_\_\_\_

Engine No. \_\_\_\_\_

Period: \_\_\_\_\_

Partner: \_\_\_\_\_

Locker No. \_\_\_\_\_

Date: \_\_\_\_\_

M.T.H.S. - Auto Tech  
Mr. S. Carlson

### **Briggs & Stratton® 5 HP Disassembly Checklist**

*For Engine Model # 135232 & Type # 1036 E1*

**Version 1.6** (as of May 29, 2007)

#### **A. Preliminary Items to Review Before Actual Disassembly Begins:**

- \_\_\_ 1. **Briggs Unit - Part 1 In First:** Complete your diagnosis unit and turn it in before continuing.
- \_\_\_ 2. **Engine Condition Record Card:** Your engine record card should be complete through Section A. Please keep it in your Hanging File Folder by your Engine number.
- \_\_\_ 3. **This Experience is Going to be VALUABLE and FUN:** You will learn in a hands-on way about engines, tools, technical reading, and accomplishing something worthwhile, something that people make careers out of and earn good money. It is something that you should gain a great deal of personal satisfaction from.
- \_\_\_ 4. **This Experience REQUIRES Patience and Calmness:** You must exercise patience and responsibility for your work. This will not be easy. Some things in this process may frustrate you. That is natural in any new learning situation. Please stay totally calm and no anger management issues please. You can do it and do it well if you concentrate, follow all instructions (especially written instructions), work together as a team, and try your best at all times.
- \_\_\_ 5. **Tool Inventory Complete, Signed, and Keep It In Your File Folder:** Complete your tool inventory and have it signed off if you have not completed it yet.
- \_\_\_ 6. **Work Area Clean:** Prepare your work area so everything is clean.
- \_\_\_ 7. **Have an Order:** Have an orderly way of storing removed parts **using milk cartons, plastic boxes, labels, and/or plastic bags** for the parts so that a) you keep everything organized, b) you know the order that they came apart in, and c) you do not loose any parts.
- \_\_\_ 8. **Bolt Removal and Storage:** Remember that standard and metric bolts must be turned CounterClockWise (CCW) from the "top" to loosen them. Where possible put nuts and bolts back together for storage so it will be easier to figure out where they go when it is time to assemble. This really reduces future hassles.
- \_\_\_ 9. **Take Notes:** Make good notes and sketches of what things look like before they come apart on this sheet or on notebook paper. This will help you reassemble your engine later.
- \_\_\_ 10. **Keep This Checklist Current:** Have one member of your team fill in the checks in the spaces provided to the left of each step as you complete it. Be sure your checklist is up to date at the end of each period so that you know where to correctly start the next day.
- \_\_\_ 11. **WARNING - FOLLOW THESE INSTRUCTIONS EXACTLY. Read every single instruction step and ask the instructor if unclear on any instruction. Do not skip any instructions. Don't take it off if the directions don't say to.**
- \_\_\_ 12. **Use Books:** Use written resources anytime. We have official Briggs & Stratton Parts books, Manuals, and various Instruction Booklets available for your use for the asking.
- \_\_\_ 13. **Agreed?:** If you read the above items, understand them, and agree to follow them, please put your

initials here: \_\_\_\_\_

## B. Exhaust System Disassembly List:

- \_\_\_ 1. **WARNING - DON'T TAKE MUFFLER ITSELF APART: DO NOT** disassemble the muffler using the 4 little hex bolts near the exhaust outlet with a socket or nut driver. **Keep it together as a unit.**
- \_\_\_ 2. **Exhaust Off:** Remove two (2) exhaust muffler bolts in lower right part of muffler with a 7/16 inch (or 11 mm) size socket or combination wrench.

## C. Big Black Cooling System Shroud and Starting System Removal List:

- \_\_\_ 1. **WARNING - DO NOT Unbolt Pull Starter itself from the black shroud: DO NOT** remove the four (4) smaller 5/16 inch fasteners around the smaller pull cord housing. The internal pieces of the starter may kind of “explode” into a bunch of individual parts and will be very difficult to put back together. **HELLO, Take heed here.**
- \_\_\_ 2. **Black Cooling System Shroud Removal With Pull Starter:** There are four bolts holding this on. Two (2) on top that bolt into the cylinder head and then two (2) on the bottom, one on each side below. Use a 3/8-inch socket or wrench.

## D. Fuel System Assembly Removal List:

- \_\_\_ 1. **WARNING: DO NOT disassemble the fuel system.** Just remove the bolts requested in order to remove the entire fuel system as a unit. Again, **DO NOT disassemble the fuel system.**
- \_\_\_ 2. **Remove the Ignition “Kill” Wires:** It has 2 black wires coming from a white plastic “push on” terminal, one of them is longer and the other is shorter. Remove the nut from the stud under the gasoline tank that has the longer black wire and its’ terminal fastened to it. Use a 7/16 inch or 11 mm socket (or 11/32 inch?) and turn it CCW. Replace the nut on the stud after removing the wire.
- \_\_\_ 3. **Air Cleaner Top Off:** Remove two (2) black plastic air cleaner top hold down screws with a 5/16-inch socket or combination wrench.
- \_\_\_ 4. **Air Filter Out:** Lift out Paper Air Filter out of Filter Housing.
- \_\_\_ 5. **Air Cleaner Base Off:** Remove four (4) gold air cleaner base hold down screws with a 5/16 inch socket or nut driver and remove air filter base.
- \_\_\_ 6. **Remove Governor Bracket Bolt Down at Base of Engine Block:** Use a 3/8-inch socket or combination wrench to remove it. It should have a really big “built-in” washer on it. It is located down by the mounting board. It is goes through the main fuel tank support.
- \_\_\_ 7. **Disconnect Hose From Tappet Cover:** Leave tube on fuel system assembly and just pull it out of the little “bent” rubber hose on the tappet cover.
- \_\_\_ 8. **Remove Carburetor Two (2) Bolts:** Use T-30 Torx and/or a 3/8-inch combination open-end box wrench. The two (2) bolts are one on either side of the carburetor, the right one slightly down (@ 4:00) and the left one slightly up (@ 10:00). **You shouldn't need to remove the “control panel” to get access to the lower right carburetor bolt.** The shorter black wire needs to be disconnected from the ignition kill switch terminal behind the “control panel.” The control panel is the plate on the side with 2 levers protruding from it and it has the words **Run, Choke, Off, Idle,** and **Fast** printed on it. Push on the metal “spring thing” until the wire is released and can be pulled out.

- \_\_\_ 9. **Remove Entire Fuel System as a Unit: DO NOT UNBOLT OR SEPARATE FUEL TANK FROM THE CARBURETOR.** Carefully unhook governor rod from governor lever down low on the engine under the gas tank as you remove the fuel system. If it is the end of the work time, leave one bolt on top to hold it and it keep it upright in the locker **SO NO GASOLINE SPILLS** on the bench or in your locker. Then, tomorrow you can finish the removal.
- \_\_\_ 10. **Gasoline and Gas Tank Storage:** Make sure your gas cap is tight on your gas tank. Very carefully store your gas tank in the back corner of your right hand locker so that no gasoline can spill or leak out. If absolutely necessary (because of an overfilled tank or other issues) you can carefully transfer your gasoline to a safety gasoline storage container with instructors help. **PLEASE, PLEASE clean up/wipe up any spills immediately so fumes don't affect others that use this series of rooms this period or next period.** **PLEASE, PLEASE be sure to place any gas soaked paper towels outside so they don't stink up the room as the gasoline evaporates from them.**
- \_\_\_ 11. **Have INSTRUCTOR sign here that you now have the FUEL SYSTEM OFF and have followed all the instructions above.**

Instructor Signature: \_\_\_\_\_ Date: \_\_\_\_\_

#### E. Cylinder Head Assembly Removal List:

- \_\_\_ 1. **Remove Spark Plug:** Use a 13/16-inch Spark Plug socket with your 3/8" ratchet and turn CCW.
- \_\_\_ 2. **Remove the Eight (8) Head Bolts:** Carefully note the position of bolt with the "stud head" (the one with the threaded bolt coming out the top the head bolt). Use a 1/2 inch socket. If necessary use a deep socket for the "stud head" bolt. **Also, take careful note that 3 of the head bolts are slightly longer than other remaining 5.** Where were they placed?
- \_\_\_ 3. **Remove the Silver Cooling System Shroud:** It is held down by the head bolts and carefully note its' position for reassembly.
- \_\_\_ 4. **Gently Lift Off the Cylinder Head and DO NOT Ruin Head Gasket:** Be careful here to save the head gasket from damage.
- \_\_\_ 5. **What does the top of the piston look like? Black or Wet or Tan or Silver**  
Describe here and tell why?: \_\_\_\_\_
- \_\_\_ 6. **What does the combustion chamber in the head look like?: Black or Wet or Tan or Silver**  
Describe here and tell why?: \_\_\_\_\_
- \_\_\_ 7. **What does the cylinder wall look like?: Wet or Silver or Scored or Smooth**  
Describe here and tell why?: \_\_\_\_\_
- \_\_\_ 8. **What does the top of the Intake Valve look like?: Black or Wet or Tan or Silver**  
Describe here and tell why?: \_\_\_\_\_
- \_\_\_ 9. **What does the top of the Exhaust Valve look like?: Black or Wet or Tan or Silver**  
Describe here and tell why?: \_\_\_\_\_

- \_\_\_ 10. **Do either of the valves lift out with your fingers?: Intake and/or Exhaust**  
Describe here and tell why?: \_\_\_\_\_
- \_\_\_ 11. **Have INSTRUCTOR sign here that you now have the CYLINDER HEAD OFF and have written down your observations on the questions above.**

Instructor Signature: \_\_\_\_\_ Date: \_\_\_\_\_

- \_\_\_ 12. **Measure the Bore and Stroke with a Dial Caliper:** Ask instructor for a measuring tool here.  
Bore: \_\_\_\_\_ Stroke: \_\_\_\_\_
- \_\_\_ 13. **Calculate the Cubic Inches of the Engine:** See page 155 your textbook for the formula. It is the same formula that you have used in Geometry to calculate the volume of a cylinder. **1) Write down the formula in this space, 2) write it again with your measured values filled in, 3) solve the formula, and 4) place answer in space provided below.**

The answer is → \_\_\_\_\_ cubic inches.

How many CCs is that? \_\_\_\_\_ cubic centimeters

- \_\_\_ 14. **If You Are OR Want to be a Technical-Type Person:** Get the Engine Parts Measurement Sheet and complete it as you work your way through this experience. **You will learn measuring skills that will really help you with any future technician work in the automotive or transportation industry. Every skill that you learn here just helps you be a better student and a better, more highly paid technician in the future.**

#### F. Valve System Disassembly List:

- \_\_\_ 1. **Remove Valve Tappet Cover Bolts:** It is just below the intake and exhaust ports, has two (2) bolts, and requires an 8 mm size (or 5/16") socket or wrench to remove them. To loosen them turn them CCW (CounterClockWise). **If your socket slips when you try to turn it, you may need a combination wrench of the same size.**
- \_\_\_ 2. **WARNING - Be very careful to save the tappet cover gasket**
- \_\_\_ 3. **Remove Valve Tappet Cover Itself:** Gently remove the tappet cover just below the intake and exhaust ports and work hard at saving the gasket.
- \_\_\_ 4. **Intake Valve Removal:** The Intake Valve has the largest valve head. **WEAR SAFETY EYE GOGGLES HERE** and then use the valve spring compressor and needle nose pliers to remove. **See steps below:**
- **Turn the Flywheel** so that the valve is closed (and the valve spring is expanded) before trying to remove it. **The keyway on the main output shaft should be pointing straight up with both valves closed.**

- **Rotate the Valve Spring Retainer** so that the **notch is facing straight out, towards you**. Use a needle nose pliers and/or a small screwdriver as needed to rotate the retainer.
- **Compress the Valve Spring** with the valve spring compressor. Adjust the jaw width so that they just fit the spring outside diameter. Open it up and push the top jaws into the upper part of the spring and the lower jaws under the valve spring retainer on the bottom of the spring. Then tighten the “T-bar” to compress the spring as much as you can.
- **Lift compressor** outside end up a little so that valve end fits through “key hole” in retainer.
- **Pull Intake valve** straight up and out of the block.
- **Remove compressor** and spring and release the spring and retainer from the compressor.

\_\_\_ 5. **Exhaust Valve Removal:** The Exhaust Valve has the smaller head of the two (2) valves. Follow the steps listed above again exactly.

\_\_\_ 6. **Measure Exhaust Valve Head Diameter:** Diameter: \_\_\_\_\_ inches

\_\_\_ 7. **Measure Intake Valve Head Diameter:** Diameter: \_\_\_\_\_ inches

### G. Ignition Section Disassembly List:

\_\_\_ 1. **Ignition System Magneto Removal: DO NOT remove the flywheel here.** The magneto is held on with two (2) 8 mm or 5/16 inch bolts (or maybe Phillips head screws). There are two (2) black wires coming out of it. The short one has already been removed from the “kill switch” terminal on the “control panel.” The longer has already been unbolted from the governor “kill switch” terminal under the gas tank before it was removed. **Take note of silver air deflector on the left bolt.**

### H. PRE-SIDE COVER (Crankcase Cover) REMOVAL CHECK POINT WITH INSTRUCTOR:

\_\_\_ 1. **WARNING - YOU WILL NOT EARN MAXIMUM POINTS IF YOU IGNORE THIS IMPORTANT CHECKPOINT. Do not take the side cover off yet!**

\_\_\_ 2. **Have INSTRUCTOR Check Your ENGINE and PART ORGANIZATION BEFORE TAKING off the side crankcase cover and going any farther NOW. (Your valves and ignition system should be off however by now.):**

Instructor Signature: _____ Date: _____
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### I. Crankcase Section Disassembly List:

\_\_\_ 1. **Engine Oil Level:** Carefully check the engine oil level. Describe level: \_\_\_\_\_

\_\_\_ 2. **Oil Removal to Oil container with NO Spillage or NO mess (Clean any Mess NOW):** Remove the METAL square-headed drain-plug that is closest to the edge of the mounting board at bottom edge of crankcase. Use your 3/8” **8-point socket** or use a 7/16” box wrench. Remove the metal plug and NOT the yellow plastic plug. Remember to turn the plug gently counterclockwise. Pour the oil carefully into an empty oil container for storage using a funnel. If the work time is almost over, wait until tomorrow so there is adequate time to clean any messes or spills right away. **CLEAN UP ANY OIL MESS RIGHT NOW SO THE MESS DOESN'T DISRUPT OTHER CLASSES THAT USE THIS ROOM TODAY.** Use paper towels as needed. Re-install the oil drain plug with your 3/8” **8-point socket** and tighten it with a 3/8” torque wrench to ten (10) ft. lbs.

- \_\_\_ 3. **Side Cover Removal:** Carefully remove the six (6) side cover bolts with a 7/16" socket or wrench. Pull gently, straight out, and evenly from the two (2) dowel pins. **DO NOT** destroy the side cover gasket or you will have to "make" a new one before your engine goes back together.
- \_\_\_ 4. **Have INSTRUCTOR Check INSIDE YOUR ENGINE NOW before Going Any Farther:**

Instructor Signature: \_\_\_\_\_ Date: \_\_\_\_\_

- \_\_\_ 5. **Connecting Rod Correct?: Yes or No Mr. Carlson > REVIEW THIS: Is the Oil Hole on the Right?**

**Your sketch of how it looks:**

- \_\_\_ 6. **Oil Slinger Correct?: Yes or No or Broken or Backwards**

**Your sketch of how it looks:**

- \_\_\_ 7. **The Governor Lever Correct?: OK or Broken**

**Your sketch of how it looks:**

- \_\_\_ 8. **The White Plastic Governor Wheel Correct?: OK or Broken or Inoperable or Missing**

**Your sketch of how it looks:**

- \_\_\_ 9. **Timing Marks Correct?: Yes or No**

**Your sketch of how it looks:**

- \_\_\_ 10. **Have INSTRUCTOR Check Your Above Sketches NOW Before Going Any Farther:**

Instructor Signature: \_\_\_\_\_ Date: \_\_\_\_\_

## J. Piston and Connecting Rod Assembly Removal Disassembly List:

- \_\_\_ 1. **Rod Cap Loosen:** Use a 5/16-inch **6-point** socket (an 8mm **6-point** will also work but is slightly looser so don't use it). **Hold the socket tightly up against the bolt so that it doesn't slip. IF IT SLIPS MORE THAN ONCE OR TWICE ASK INSTRUCTOR ABOUT THE COOL "SPECIAL BOLT REMOVAL SOCKET."**
- \_\_\_ 2. **Rod Cap and Oil Slinger Removal:** It should come off after the two (2) rod bolts are removed. Its' left edge should be slanted to the right and its right side should go "straight down."
- \_\_\_ 3. **Piston and Rod Assembly Removal:** Push it straight up out of block. **DO NOT pull the piston pin or separate the connecting rod from the piston. DO NOT remove the rings from the piston.**
- \_\_\_ 4. **Have INSTRUCTOR Check Your PISTON and RINGS NOW BEFORE Going Any Farther:**

Instructor Signature: \_\_\_\_\_ Date: \_\_\_\_\_

- \_\_\_ 5. **Rings Correct: Yes or No**

## K. Flywheel Section Removal List:

- \_\_\_ 1. **WARNING - DO NOT loose the little square "key:"** Save the little square "key" that helps align the flywheel properly with the crankshaft for correct ignition timing. It is about 3/4" long and about 1/8" square and the engine cannot start properly without it. Again, **DO NOT loose the little square "key:"**
- \_\_\_ 2. **Flywheel Removal:** Use a 15/16-inch socket. We usually use a 1/2-inch drive air impact wrench with the 15/16-inch impact socket to remove this nut. Please leave the little silver cooling deflector (on the right side behind the flywheel) on the block. Please do not remove the two (2) bolts (7mm).

## L. Crankshaft and Camshaft Disassembly List:

- \_\_\_ 1. **Crank and Cam Removal:** Carefully remove the crankshaft and camshaft out the side together.
- \_\_\_ 2. **Hurray for you:** You've successfully got your engine apart. Hopefully you took good notes so that it goes back together nicely and runs better than before you took it apart.

## M. BARE BLOCK CHECK POINT WITH INSTRUCTOR:

- \_\_\_ 1. **Have INSTRUCTOR Check Your ENGINE and PARTS ORGANIZATION NOW BEFORE Going Any Farther**

Instructor Signature: \_\_\_\_\_ Date: \_\_\_\_\_

- \_\_\_ 2. **WARNING - YOU WILL NOT EARN MAXIMUM POINTS IF YOU IGNORE THIS IMPORTANT CHECKPOINT.**

## **N. Complete Briggs & Stratton Unit 2 – Disassembly:**

- \_\_\_\_ 1. **Engine Parts Measurement Activity Sheet Continue:** If you are about average time in disassembling your engine, get an Engine Parts Measurement Activity Sheet and complete it. Ask instructor for help as necessary. If you are way behind or don't want to get this "technical," complete the rest of the items without this activity for a few less points.
- \_\_\_\_ 2. **Finish B & S Unit 2 and TURN IT IN NOW before going back and continuing with Engine Assembly.**

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