

Installation instructions for RB Pullstart kit.

A. Disassembly

1. Move piston to top of stroke (or as close as possible), by attaching the flywheel and loosely tightening. This not only gives you something to hold on to, but when pulling the rod off the crank won't slide forward making the task impossible.
2. Remove four screws and remove backplate, making sure bottom of piston is not catching on top of backplate. There's a groove in the backplate to clear the bottom skirt of the piston when it's all the way down. Force the backplate off when the piston is down and you'll break the piston.
3. Take out the four screws in the engine head.
4. Remove engine head and shims.
5. Remove piston sleeve. There are many ways to do this. When the engine is new, it is VERY tight, and if the head is off, it will probably pop up when the piston is raised. Rotate the crankshaft using the flywheel. Near the top of the stroke, you should see the sleeve starting to rise. Once it's up enough, stick your fingernail or the end of a zip tie (no metal objects) between the top of the crankcase and the bottom lip of the sleeve. This will prevent the sleeve from being pulled down in, but won't cause damage. Reverse the rotation of the crankshaft, pulling the piston back down. Remove the sleeve by hand. Remove the sleeve and set aside. If this doesn't get it put the tip of the zip tie thru a port, be careful you don't go too deep. Rotate the flywheel. If it moves a little then gets stuck, back off on the flywheel and pull the zip tie out a little more.
6. The piston will now be loose in the crankcase. Holding the engine upside-down to prevent the piston from being jammed in one of the ports), rotate the crankshaft until the crankshaft journal (where the connecting rod connects to the crankshaft) is at the top of it's rotation.
7. Here's the hardest part. Removing the connecting rod from the crankshaft journal.
8. The most important part here is to realize that the rod will slide back and forth on the wrist pin (piston's pin). In order for the rod to come off the piston has to be all the way forward while you pull the rod off the back. Hold the engine up (crank pointing down) hold the rod steady with your finger and gently wiggle the piston until it's all the way forward.
9. Now pull the rod off the crank. RB shows a crow's foot wrench will pop this off, but I've yet to find one that is the right size. Instructions are available from the manufacturer for removing the rod here:
10. [URL=<http://www.rbproducts.com/rbww/faqrb/howtochangeconrod.htm>]Instructions[URL]
11. Normally by having the flywheel on (crank fully seated) the piston slid to the front, you can gently wiggle the flywheel while pulling the rod with your fingers and it will come right off. If not, an alternative that I've found works well is to use some of the thin coated cable often found in the airplane section of your LHS. It's the stuff they use for pull-pull rudder systems. Thread this behind the rod, grip the two ends with a vise (making a loop of the cable), now repeat the above ensuring that the piston is all the way forward on the rod, pull the engine away from the vise

(pulling on the cable which is pulling on the rod) and wiggle the crank back and forth by turning the flywheel. You'll know your doing this right when the rod pops off with very little pressure. **DON'T HORSE THIS THING!**

12. Once you have the connecting rod removed, take out the piston and set it aside.
13. Remove the flywheel. Remove the crankshaft by pushing it through the back. If it's stuck, a few light blows with a rubber-headed hammer or plastic screwdriver handle will do the trick.

B. Assembly

1. Put in the new crankshaft (the one with the hole bored in the front of the journal), by pushing it through the back until it stops.
2. Lightly install the flywheel.
3. Reattach the connecting rod and piston, again make sure the piston is all the way forward on the rod before attempting. The piston has a notch on one side of the skirt. This is to clear the main bearing and faces forward. A few drops of after-run oil will help the connecting rod bushing to slide over the journal easier. Be careful when putting the connecting rod back on that you don't bend anything. It may be necessary to wiggle the flywheel a little. **DO NOT HORSE THIS.**
4. Replace the piston sleeve. It is a good idea to put a few drops of after-run oil on the inside of the sleeve to prevent excess friction during installation. Rotate the crankshaft until the piston is at the top of it's stroke. Now, insert the end of the sleeve into the crankcase, and align the piston so it fits in the sleeve.. Once the piston is in the sleeve, gently push the sleeve down. Make sure the indexing notch is lined up with the notch in the crankcase, before you press down. If it's already down, it will be very hard to rotate the sleeve into the correct position. Once the indexing notch is lined up, push the piston down to seat it. It should be slightly below the level of the crankcase.
5. Take the turbofan/one-way bearing assembly out of it's package. Find the small silver precision washer, and push it over the pin in the turbofan, until it is down all the way. It might be kind of a tight fit. That's good. Put the turbofan's pin into the hole on the face of the crankshaft journal. Make absolutely sure that the pin is actually in the hole and not on the side of the rod. It is a good idea to put a drop of after-run oil on the pin and in the hole.
6. Place the large, black washer in the recessed portion of the new Ofna backplate (on the 'inside' of the backplate).
7. Put the new backplate into position. The recessed portion of the backplate (where the black washer is) should engage the raised portion on the back of the turbofan.
8. Many people seal the backplate. It has an o-ring seal, but it's not very effective. Use a very thin film of Permatex Ultra Copper silicone sealant (available at any auto parts store) around the area where the crankcase and backplate meet. More is not better. Excess will just get inside the engine, which is a bad thing.
9. Attach the backplate with the screws you removed earlier. The protruding tab on the backplate should be on the upper left corner. Make sure the piston is UP near the top when you do this or you'll break the bottom skirt off.
10. Reattach the engine head, using the screws you used earlier. Make sure that both shims are in place if you are using 20% nitro fuel. C5s the double dot on the button indicates the exhaust port. Not a big deal on a std C5, but a very big deal on a

Rody Modified. Use the stock head for break-in. Aftermarket high capacity cooling heads will only make it more difficult to keep the engine at it's operating temperature during the 'rich' break-in period. Make sure that the shims are in place, no matter which head you use.

11. Tighten the screws on both the backplate and engine head in a cross pattern to prevent warping. That's: Upper left, Lower right, Upper right, Lower left.
12. Prepare the recoil. I like to put a small screw into the housing to prevent the spring from coming out. Drill a small hole (1.5mm) right next to the spring where it locks into the housing. Use a 2mm self tapper (my box of Tamiya stuff has several) and screw this in. The head of the screw will cover the spring.
13. 18b. Put a drop of CA on the knots.
14. Get the starter shaft out (the black shaft with a hex on one end) and the recoil. Seat the shaft fully in the recoil. A light tap will ensure this is fully seated. Handle cautiously, you don't want to pull the hub out. Rewinding a recoil is NOT a fun job. Be sure to put a few drops of after-run oil on the shaft to lubricate the one-way bearing. The one-way is lubricated by fuel, but a little extra oil during early stages can only help. DO NOT USE GREASE, it will foul the one-way.
15. Attach the pull start to the backplate with the provided screws. A thin film of Permatex here is advantageous too, though probably not necessary.

C. Break-in

1. Resist the urge to pull that cord! These engines are very high compression, very tight, particularly when they are new. A tip to help in starting during breakin and reduce the loads on the pullstart is to pre-heat the engine. Use your heat gun or a hair dryer to bring the engine up to ~200° before pulling the cord. What this does is allow all the pieces to expand to their operating design sizes. It WILL make starting a LOT easier.
2. Use the RB plug or MC9 or equivalent.