

The Outboard Teardown

1951 Evinrude “Big Twin” 25 By: Steve Silverthorn

There is not much that is more satisfying than repairing or restoring something yourself. An antique outboard is a great example of a do-it-yourself project that you can carry out with some basic hand tools, a few specialty tools, and a parts diagram or manual. Whether you just want to do a tune up or a full restoration, you will need to disassemble your motor, partially or fully. Here’s how to do it!

Plan A

Like most things that you want to work out in the end, you need a plan. We have all seen the neighbour at the cottage that took his outboard apart to “fix” it. And year after year it sits in a pile in the back of the garage with most of the parts in a bucket. No clue what’s wrong or how to put it back together. You don’t want to be that guy. I am going to try to suggest the process to follow for your outboard disassembly, which will keep you and the parts organized, minimize damage, reduce frustration and best of all, a quick and easy assembly; and a working motor!

It’s All in the Preparation

Find a location in your basement or garage with lots of light, get the motor on a decent stand, some work space, a box of plastic sandwich bags (not for sandwiches), a black magic marker and your tools.

Buy yourself an after-market shop manual (1). These are great books for the new mechanic that have lots of pictures and descriptions on disassembly, condition verification and assembly. Also include a camera (or phone) and take lots of pictures. When it comes time to assemble, the correct picture can save you from a meltdown, or taking it all apart again because of that missing cotter pin.

Authors Notes

Most motors I take apart are for complete restoration. Therefore, I disassemble most major parts for repair and paint. Every restoration I do essentially has the identical process. In my case I install all new ignition, including wires and plugs, install a carb kit, replace all lower unit seals, fully clean the motor, prime and paint and re-assemble. You may not need to go this deep if you are only focusing on one item, like the lower unit.

Demo Day

The motor for this article is a 1951 Evinrude 25 HP, manual start. This motor will be completely restored. This motor is similar to all Johnson and Evinrude motors from 1950 to the late 1960’s. I was not aware of any history on this motor. Although I recommended a sturdy stand for motor disassembly. You can see from the pictures I did not follow my own recommendations. (2 & 3) *Cont’d on page 7*



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The “Long” view

Not so fast! Let’s have a look at the “macro” view of the motor. Stand back a bit and observe. Are there parts missing, dents that cannot be removed, chunks broken off or parts that are obviously past their prime? During the marco view you may find something that is so seriously wrong you will decide not to proceed. During my marco view I found all the usual stuff:

- Split rubber on the pull start **(4)**.
- Grommet behind the choke that is split.
- Wrong grip on the tiller handle **(5)**.
- No handles on the transom thumb screws **(6)**.
- Damage on the side of the exhaust housing, (could have been a deal breaker).
- And a host of wrong fasteners holding parts on the motor.

Have a note pad and pen handy and write down these things. When it comes time to collect or buy parts and pieces it makes it a whole lot easier to have a list. For me there were no “deal breakers” to proceed. I was prepared to replace the exhaust housing, in this case.

Take pictures of the motor before any disassembly, especially the hood if you plan to paint and apply new decals. The pictures will give you references to where the decals go.



Evinrude “Big Twin” 25’s ready for action at a Northern Ontario fishing lodge.

In my case I had a decal that was so faded it was hard to find, so I took a close-up picture to indicate its location.

The Internal Inspection

Why proceed with your repair or restoration if the motor is junk? Taking the compression of the cylinders will give you an indication of the motor’s internal health. I took the compression of my motor and both cylinders were about 75 PSI. Closer to 100 PSI would have been more desirable, but for the purposes of this motor (mainly display) this will work **(7)**.

If the motor has electric start hook up a battery or 12 volt booster to use the starter to turn over the motor to test the compression, as well it tests the starter.

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Wrenchin' Time

OK, the part you have been waiting for, the disassembly. Three things to keep in mind:

A) Put the small parts and pieces in a sandwich bag and label them. **(8)** I have disassembled a lot of motors but still put most parts in clear bags. The bags store easy, don't make everything greasy, keep "like" parts together and you know what they are for when assembling the motor. I don't label all my clear bags, as some parts are obvious. I actually keep "all" the parts removed at this stage, even if they will need to be replaced. This is a good habit, as you might need to refer to the broken part for reference.

B) Make notes (and pictures) as you go about problems you encounter or bolts you snap off etc. it will help later.

C) If you plan to remove parts like the head or bypass covers, it is waaaaay easier to loosen all the screws or bolts for these when the engine is still attached to the rest of the motor.

Top Down Approach

Start at the top and remove the recoil start. Then the side brackets, identifying the right and left bolts on the clear plastic bags. Remove other peripheral items like the shifter Lock Bar, throttle linkages, vacuum switch and any other pieces that can be removed



Evinrude "Big Twin" 25 hp pulling five water skiers. That's Pulling Power.

My Shifter Lock Bar had the wrong bolt in it which made it unsafe. I made a note. Next remove the flywheel. You will need a flywheel puller, **(9)** a big ratchet and a little luck. **(10)** These can be hard to remove, but keep trying. On this motor the flywheel was stuck.

I finally got it off, but cracked the flywheel in the process, so I had to acquire another. Once the flywheel is removed you can now remove the armature plate. **(11)** Then also remove the armature plate support and retaining ring. Regarding the plate support, use a screwdriver and carve an "F" into the front of the ring, so you know how it goes back on. **(12)**

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Now remove the carburetor and linkage. Take good pictures of the carb linkage, so you can reinstall correctly.

As far as fuel and vacuum hoses go, I just cut them off and throw away, as they are usually brittle and not reusable. Throw away the hose clamps too and use new hoses and clamps for assembly. Make note (or mark with a piece of tape) the vacuum and air fittings in the intake manifold so you assemble correctly. I find that there is little need to remove the intake manifold on most motors, unless you notice issues with the existing manifold.

If you plan to install a new head gasket, now is also the time to loosen off all the head bolts. It makes it much easier to remove the bolts on the bench. Often a head bolt will break off in the block. I broke one off. That can be addressed in a different article.

Remove the nuts and bolts that hold the engine on and then lift the engine straight off the exhaust housing. **(13)** You will notice the drive shaft from the lower unit sticking up through the exhaust housing.

Next is the removal of the lower unit. Most motors have an access plate on the side of the exhaust housing to disconnect the shift linkage that goes into the lower unit. If it does not then consult the manual to find out how to disconnect.

Once again, removing a part like the propeller when the lower unit is still attached, makes it easier. If your motor only has a forward gear, you won't have a linkage at all. Once disconnected and the bolts out of the housing the lower unit will slide down and off.

Graduation Time

You are done! The larger parts can go in a pile **(14)** and your smaller parts and clear parts bags can go in a bin. I use plastic parts bins I salvaged from a bankrupt Jag dealer, but you can also buy these bins at Canadian Tire etc. They are heavy duty and can stack. **(15)**

Whether you just removed one part or did a complete disassembly you can now more easily move the parts around. Since my sons left home, I now need to disassemble the motors in the garage and then I can carry everything to the basement myself. Do your repairs or restoration on your motor, but don't wait too long to put it back together.

I don't need to tell you why!

Once your motor is repaired or restored and back together you will wish you had done this sooner and will be scouting out your next project. This project will end up like this: **(16)**

Have fun and remember to take your time and stay organized. It will keep the meltdowns to a minimum and maximize your fun.



Restored 1951
Evinrude "Big Twin" 25