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Link: <https://www.youtube.com/watch?v=bx-cYZD1DPY&t=645s>

Kayak Buddys thanks you for your business. As an avid kayaker, it is my please to produce propulsion systems for various paddle watercraft. The standard/upgraded engine drive system you have purchased is outfitted with all stainless and aluminum hardware. You will need to mount the unit using either a custom-made mount or a purchased unit from a supplier. Please remember the propeller needs to be fully under water and below the hull in the non-turbulent water when mounted, so a custom mount that is adjustable is recommended. The waterline in which the drive system is mounted is crucial, so please make sure you check the prop height as compared to the bottom of the kayak. It should sit lower than the deck bottom, otherwise it will cavitate much like any other outboard engine. The engine drive systems height can be adjusted over 6 inches vertically in either direction to accommodate the different styles of watercraft. Remember the unit weighs roughly 23lbs. with a standard engine mounted (12lbs by itself), so you will need a float on the engine side or a weighted ballast on the other to have optimum balance if you are not rear mounting.

The notes are broken down by section so they are easy to follow.

Build Instructions in Detail:

Opening the box and exploring the parts.

1. Remove all parts from the box and make sure nothing is damaged from shipping first.
2. If you purchased a **standard non-upgraded drive**, you will be assembling the bracket and tiller handle along with adding 80-90 weight gear oil to the lower gearbox and aligning the collars on the drive tube. It comes standard with a 3-blade prop and twist throttle.
3. If you purchased an **upgraded drive**, it comes built for you outside of the bracket attachment. The oil has been added and the collar alignments have been completed. You will need to adjust the vertical height since every kayak is a bit different. The prop, twist shifter, and wire harness for a Honda powerhead has been added already.
4. On both versions the main bracket needs to be attached with the stainless through bolt, washers, and a nut. It is always wise to add a bit of marine grease to any part that rotates.
5. * **As of June 1, 2020**, all drives will ship with the clutch housing detached from the top of the drive tube. You will notice a black or red cap at the top. Please remove the cap and slide the clutch housing on the tube and into the drive shaft. You want this to fit easily without force. You do not want to push the driveshaft to tight from the clutch housing side or it will affect the rotation of the gearbox. This is greased for you already. Make sure the splines are fully seated before you tighten the 2 bolts. Do not overtighten since this is aluminum. The center bolt on the clutch housing is an alignment bolt and the larger outer bolt is for the clamp on the drive tube.

Running the drive unlocked.

6. In case you would like the drive to pivot upward, there is a clamp at the mid-section of the drive tube that can rotate 180 degrees. This allows the drive to move on an angle if something is struck under water. It is advised that you make sure you snug the bracket bolt up to allow a bit of tension on the drive. This will prevent the engine from rotating all the way around. A bungee cord can be used around the upper portion of the drive tube to help the system return to its normal resting position on the bracket.

Collar adjusting.

7. The collars that sit above and below the bracket can be loosened to adjust the vertical height. This is usually completed on the mount to get the ideal depth of the prop. There are 3 Allen keys that comes with the kit to help with the adjusting.

Tiller arm placement and adjustment.

8. On the upgraded versions the tiller arm is installed on the right side of the drive but can be flipped and rotated based on operational preference. You can loosen the clamp and rotate as needed and adjust this vertical angle as well. Inside the clamp there is a spring that should be coated with marine grease along with the clamp post that screws into the bracket. On certain models that are built for tiller extensions and have tight angles, the tiller is shortened or pushed back through the clamp to address the angle needed.

Kill switch placement.

9. **The upgraded drive has the kill switch in the optimum location.** Of course, this can be repositioned. The drive systems control position is up to the operator, rotating the throttle so the cable is under the tiller arm and kill switch facing sideways is usually what most people prefer. On the upgraded drive, it comes with a waterproof harness attached to the kill switch already. The harness has an eyelet on the red wire and a bullet connector on the black. The eyelet will need to be attached under the closed bolt when the engine is attached and the black wire with the bullet gets crimped to the black wire on the Honda. You will need to strip a bit of the black wire on the Honda engine. Please heat the end to help keep water out.

Engine installation.

10. Take the engine out of the box and make sure the pull cord is facing the toward the passenger before placing it on the drive system. Please make sure you have a mount or stand for assembly and tighten the mounting clamps on the bracket, so the engine does not fall or slide off.
11. Once you have the engine set-in place, you can add 3 of the 4 mounting bolts and leave the one closest to the carburetor off for the moment. This is bolt that the eyelet from the kill switch goes under. Snug the bolts up.

Throttle cable attachment and shifter adjustment.

12. On both versions of the drive the throttle cable mounts the same. You will begin routing the throttle cable up to the threaded adjustment plate up under the carburetor and behind the air cleaner. On most non-Honda engines, you can screw the threaded end of the cable right up underneath the attachment plate and place the lock nut on the barrel nut to secure the position. On Honda engines you will need to pop the front cover off the air cleaner to access the plastic cable lock. This plastic lock is open ended so you can loosen the barrel nut and attach the lock nut. * **Make sure when you attach the throttle cable you rotate the butterfly of the carburetor downward and place the soldered end in the conical shaped opening on the adaptor that is attached to the butterfly. One side has the groove and the cable feeds right through.** If there is a bit of extra length in the cable you can adjust the twist shifter at the shifter

side to pull the cable back a bit. On all the drive builds starting in May 2020, a set of 3 stainless washers come on the barrel nut to help give a bit more adjustment on the cable. You can place these on either side of the barrel nut as needed. The Shimano shifters are quick shifters and on use about 4 out of the 6 click settings on the shifter.

Greasing cable.

13. If this is a standard drive, you should add grease the cable end because it is galvanized and will bind if grease is not applied periodically. This is very important for optimal operation. Make sure you set the open and close of the throttle with the barrel nut adjuster and shifter. I usually set the system to start opening after 1 click. It should idle with the prop not turning. Pay attention to the cable, since it is very easy to tighten the cable too much and have it bind or idle to high. Spray and grease the cable with a marine grade spray lubricant. **The upgraded drive systems cable sheath is Teflon lined with a stainless cable, so you do not need an internal lubricant, just a bit of grease on the end connector and throttle cable. Use a marine grease due to exposure.**

Trim and angle adjustments.

14. From this point make sure you adjust the trim bolts as needed. I usually run with about 7 degrees rise on the prop to slightly lift the bow under power, otherwise you will bury the nose. This is not a bad thing since kayaks are water displacement and drive smooth when the nose digs in.

Adding oil to the Honda engine.

15. First, please read the manual. This is where most operators fail to realize how little oil goes in these small engines. Fill your crankcase oil with the engine on its side with the filler cap pointing up and the prop facing downward unless it is a drop-in drive. Most Honda versions take about 4 ounces of oil. Measure it. My rule of thumb is to look down into the crankcase and fill to the lowest thread on the filler cavity. **DO NOT FILL THE ENGINE IN THE VERTICAL POSITION.** Any more will get sucked up into the carburetor through the breather and bog the ignition down and the engine will not start correctly. 30 weight non-synthetic is what I use, but some people have used synthetic with great results, Honda engines have tight tolerances.

Starting the engine.

16. Now, you are ready to add gas, choke and prime the bulb in order to fire it up. Make sure you do not overfill the oil, otherwise it will end up in the carburetor. * I would use a high-grade non-ethanol fuel such as TruFuel.
17. Grease all rotational parts and spray all surfaces with CRC marine for the utmost protection from saltwater if you are using it in that environment.
18. Please run the carb dry if it will sit for an extended amount of time.

Prop removal.

19. The standard drive has a 3-blade prop that is attached with a 4mm shear pin and a cotter pin to hold the prop to the output shaft. This can be removed and replaced if it gets damaged.
20. The upgraded drive system has the 2-blade prop and collar attached with Loctite on the collar attachment bolt threads to prevent the prop from loosening up. Check occasionally to make sure it remains secure. Removal is not needed unless a fin is sheared from hitting an obstruction. A spare shear pin is included with the original prop and shifter as well. All components are in separate plastic bags.

Break-in.

Once you have it started the engine and all throttle adjustments are made, let it thoroughly warm up (5 minutes) and begin to cycle the throttle up to half throttle for a for a 2-3 minutes and then let it idle for another 5 minutes. I then let it completely cool and complete the procedure again. Ring seating is not necessary but completing a few heat cycles ensures everything breaks-in as normal. Being that these engines are air-cooled it is vital to check oil every trip and change the crankcase oil every 20-30 hours of use. These do not have low oil shut off switches, so please check accordingly. Coat all engine services after use with a good WD-40 or corrosion block to keep all metal surfaces clean of oxidation.

If you need any assistance, feel free to go the website and use the comment page under help to drop a note to us here at **KAYAK BUDDYS, LLC**. Please include all relevant information, so we can further assist you. If you need more immediate help, please call 305 926-2937.