# Backwater Performance Systems

## Stock Vanguard Vertical 42MM Mikuni Single Carburetor Kit


1. Mikuni Manual
2. Carburetor (42mm)
3. Intake Adaptor Gasket (4 hole)
4. Carburetor Flange
5. Air Cleaner (Screen)
6. Pre Filter
7. Crankcase Ventilator Tube
8. Air Cleaner Adaptor Set Screws (2ea)
9. Loctite
10. Air Cleaner Adaptor
11. Governor Lock (10mm)
12. Governor Lock Bolt and Washer
13. Choke Braket
14. Intake Adaptor Bolts (4ea)
15. Flange Bolts (2ea)
16. Intake Adaptor Washers (4ea)
17. Flange Washers (2ea)
18. Butt Connectors (2ea)
19. Throttle Bracket Bolts ( 2ea)
20. Rev Limiter Self Tap Screws (2ea)
21. Needle and Seat
22. Throttle Cable
23. Rev Limiter Gasket
24. Rev Limiter
25. Throttle Bracket
26. Throttle Cable Clip and Screws (2ea)
27. Intake Adaptor
28. Throttle Cable Barrel and "C" Clip
29. Throttle Cable Tube

**Tools required.**

metric and US hex wrench set
12mm socket
10mm wrench
7/16 wrench
flat and philips screw driver
side cutters
tape meausre
pliers
wire crimper
drill
hack saw blade

***Notice: You are responsible for the use, correct installation and service of this carburetor. BPS is not liable for installation or any subsequent damage to the motor due to use, installation, jetting adjustment and maintenance of this carburetor.***


# Do This First

## Needle and Seat Installation Instructions

With this instruction, you will remove the fuel inlet needle and seat and replace it with a set matched for your fuel pump.

Turn the carburetor upside down and remove the four bowl screws. Use the correct screw driver size and press down firmly while removing. They are very tight and the head strips easily.

Remove the float screw. Then carefully lift out the black float and the small pivot pin. The needle is attached to the center tab with a small wire clip. Remove the needle from the tab. Lay the black float aside on a clean surface and careful to not bend the inner tab.

Remove the needle seat hold-down screw and pull out the seat with a pair of pliers. Slide the new seat into the hole and then reinstall the hold-down screw.

Insert the new needle on the black float tab. The needle wire slides over the tab as shown.

Set the float back on the carburetor with the needle inside the seat. Be sure to get the float pin all the way in the groove. Reinstall the gold hold-down screw. Again, be very careful to not bend the float tab. This regulates the fuel level in the bowl.

Reinstall the carburetor lower cover. Tighten each screw lightly first and then evenly tighten all four. You are done.

*Depending on your load and altitude, you may need to change the main jet size. Larger jets richen the fuel. A smaller jet size leans the fuel mixture. The bottom photo shows the location of the main high speed jet. You can change the main jet with the float bowl cover on or off. The main jet size is stamped into the end of the jet. Your carburetor comes with a 175 main jet. When the carburetor is mounted on the engine, you can access the main jet by loosening the carburetor, rotate it and remove the nut from the lower bowl cover. See the top second photo.*

# Assembly


Remove the top air panel.


Trim the panel as shown with a saw. Basically, remove a section in the center of the panel 3 inches wide up to the first groove on top.

Remove the air cleaner assembly, carburetor linkage, the carburetor, carburetor cross brace and the fuel line. Tape off the grey carburetor solenoid valve wire so that it doesn't short out.

Remove the entire rear governor and throttle assembly. Four 12mm bolts hold the assembly in

place.

Remove the governor arm.

The engine should look like this when carb and linkage are removed. All that remains is the intake manifold.


Install the carburetor intake adaptor (part #27) with gasket (3) to the intake using 4ea, 6mm X 8 mm socket head bolts (14) and lock washers (16). Tighten to 18 inch pounds. Use one drop of loctite on each bolts.

Install the carburetor rubber flange (4) to the intake adaptor with the two 5/16" X 3/4" socket head bolts (15) and 5/16" lock washers (17). Tighten to 25 inch pounds.

Install the carburetor (2) fully on the flange and tighten the clamp.

Install the air cleaner adaptor (10 with two 1/4" set screws. Place one drop of loctite on each set screw. The air cleaner should be mounted with the crankcase ventilator tube (7) to the left side of the carb as shown.

Install the air cleaner and air cleaner prefilter (6).

Step back and look to make sure the carb is on straight. Loosen the clamp before attempting to rotate or carb

damage will occur.
Remove the governor arm spring pin and plastic washer. It should look like this with all hardware removed.

Install the governor block (11) with bolt (16) and washer (16).

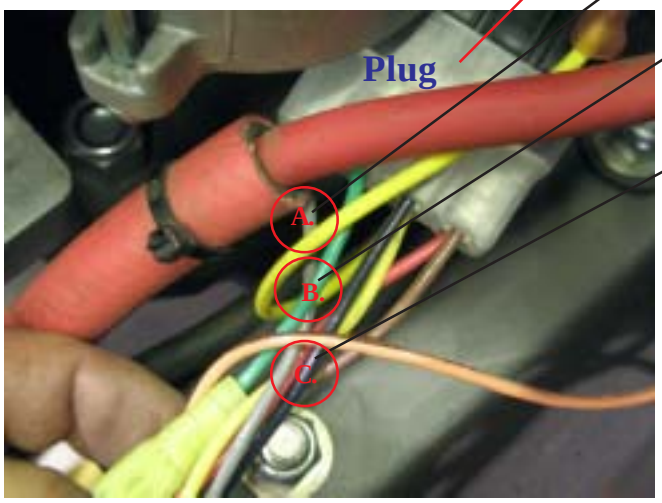
You must lock down the governor shaft so it does not move.

Install the governor block with the slot facing upward and the split pin under the lock next to the aluminum boss on the front of the engine as shown.

Lock the governor shaft in place by rotating the governor arm shaft counterclockwise with a flat tip screwdriver while rotating the governor block clockwise. Tighten the bolt to 25 inch pounds. **There should be no free play in the governor shaft**.

Install the rev limiter (24). First install the adhesive backed gasket (23) to the rear of the rev limiter. The gasket also seals out moisture, so place it evenly. Mount the rev limiter to the boat transom in a dry area. Run the wires along the battery cable to the 8-way engine wire harness plug. Do not overtighten the screws.

Install the rev limiter wires as shown.




First clip the grey and the green wire from the white 8-way plug. They do not connect to anything.

A. The red (+) Rev Limiter wire connects to the 12V grey plug wire.

B. The black (-) Rev Limiter wire connects to the green plug wire.

C. The green Rev Limiter wire **splices** into the engine black ground wire with butt connector. Cut the wire in the center here. The two black ends and green Rev Limiter wire connect together.

You will need to test the rev limiter later on in these instructions. It is set for 4350 rpm for stock motors and 5100 rpm for the 45 horse engine. Make sure you have the correct rev limiter chip (yellow).

Throttle Cable Installation:

Remove the stock throttle arm and bolt. Install the throttle cable barrel lock (28) with the 1/4" spring clip (28).

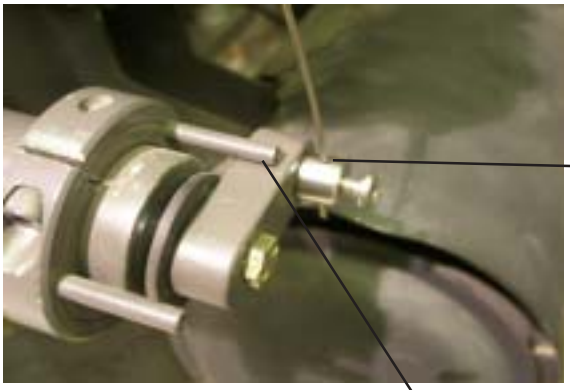
Spring clip mounts on the backside of the throttle arm. We gave you two clips because you will drop one. (smiley)

Remove the two crankcase ventilator cover screws and mount the throttle cable bracket (25) with the two 6mm X 20mm socket head screws (19). Place a small drop of loctite on the screws and tighten to 18 inch pounds.

Install the throttle cable receiver tube (29) on the carburetor as shown with the slot facing upwards.

Mount the throttle cable (22) by inserting thecable round end into the carb throttle lever. Loop the cable over the wheel and through the slot on the throttle cable receiver tube.

Now rotate the cable receiver tube slot to the bottom locking the cable in place. Insert the throttle cable metal end into the receiver tube. It may be tight so press it in firmly.



Insert the cable wire into the flange. Twist the cable in the direction of the wind so the cable does not separate.

Install the two cable clamps (26) with the self tapping screws (26).

Adjust the throttle cable. Take the slack out of the cable by gently pulling the cable while you tighten the cable barrel screw.

The throttle arm should also be up against the throttle lever stop pin.

Install the fuel line. Make a gentle loop so the fuel line does not kink.

Install the crankcase ventilator plastic fitting (7)into the air cleaner flange.

Connect the crankcase ventilator tube.

Check the throttle by twisting the throttle grip and observing the carburetor, making sure the carb is full throttle.

Wire tie the small black carb drain hose to the front of the fuel pump.

Continue and route the carb drain hose away from the exhaust, to the side of the engine and through the hole on the mounting boss. Caution: Fuel can escape the carburetor through this tube and it should be mounted away from the hot muffler and exhaust gases.

Install the choke bracket (13) and throttle cable sleeve (30 to the top of the cowl using the stud and nut on your motor. Place the throttle cable inside the sleeve first.

Mount the choke cable.

Note: Make sure the choke cable is inserted fully into the carburetor after you install the choke cable. Pull out the choke knob and the knob should click and hold in the open position. If the choke cable is pulled out of the carb, it will run rich.

Remove all of your tools and inspect all connections and bolts.

Install the optional rain cover by spreading and gently sliding it over the pre-filter. Be carful. Do not cut the pre-filter.

If you have a fuel line bulb, pump fuel into the carburetor. *Do so gently. Tip: If you do not have a fuel bulb, you can close the vent on the fuel tank and press in the center of the tank. This will push fuel into the carburetor.*

Pull the choke out. Start the engine. If it revs up too high, the throttle cable is too tight. Loosen the cable.

When the engine starts, set the idle to 1200 rpm using the idle adjust knob and cable.

Adjust the air/fuel mixture by turning the screw 1/8 turn in or out 1/8 turn. A little more if needed. The screw is set at 1 1/2 turns and this is usually the best idle setting. Readjust the idle to 1200 rpm.

Test the rev limiter by increasing the speed a little at a time until you reach 4350 for the stock engines and 5100 for the 45 horse engine. If the engine goes beyond the rev limiter setting, check the electrical connections. If the engine reaches excessive speeds, shut it down and contact BPS at 801.352.8011.

**Read this: Rev Limiter Operation and Warning**

The installation and use of this carburetor kit is the responsibility of the owner. Call BPS at 801.352.8011 if you have any questions or concerns.

Install the wires carefully and fully. The rev limiter protects your engine from over reving, especially when you hit something and the propeller comes out of the water. Do your best to let off the gas when the propeller leaves the water.

Test the rev limiter by slowing raising the warm engine speed to its limit, 4350 for stock motors and 5100 for modified 45 horse motors. The engine should cut out when it reaches this limit within 100 rpm.

Every motor and boat load runs differently. If your engine bumps the rev limiter, meaning it runs at or very close to the rev limiter cut off speed, you should consider getting a larger lower gear on a Mud Buddy, or larger prop on other motors. The rev limiter life is shortened and it will overheat if you continually bump against the limit. The rev limiter's purpose is to restrict a runaway engine, not to set your top engine speed. Your goal is to reduce engine rpm with a bigger gear or prop to keep the rpm lower than the rev limiter chip setting. And, your boat will run better.

**If the rev limiter fails, is damaged, or losses power, its safety default will shut down the engine. If this happens, you should check the wire connections. In an emergency and if your engine will not start, disconnect the green wire and the engine will now start. You can run the engine for a short time, but do not over rev the engine. Replace the rev limiter immediately. Rev limiters have a one year warranty.**

**Mikuni Manual:** This is an aftermarket Harley performance carburetor. Read the Mikuni manual and apply those things you need to know for our application.

**Service and Maintenance:** Lubricate the moving parts of the carburetor. Protect the carburetor from rain and snow while in storage to ensure water does not enter the engine.

**Adjustment: The Mikuni carburetor is set up at BPS for best all around performance.** We highly suggest you use our tuned stainless exhaust with this system.

The Mikuni carburetor has an accelerator, idle, mid range and high speed adjustment. Your carburetor comes with stock jetting and some custom BPS internal parts. The Mikuni carburetor will almost certainly run correctly on your engine as designed and with the installed parts. But if it doesn't, you may alter its tuning to suit your engine's needs and the type of conditions you encounter such as load, altitude and temperature.

The accelerator pump is factory set, however adjustments can be made. See the owner's manual for more information.

Your carburetor comes with stock parts. The instructions we provide will help you install the high speed jet and the needle and seat. Jets and parts are available at BPS, 801.352.8011

**Warranty:** This carburetor may not meet California air emission standards. You will not be provided Briggs and Stratton warranty service if this carburetor is installed at the time you request warranty service. There is no warranty on this product, expressed or implied.

**CAUTION:**
**You are responsible for the correct installation and use of this product.**
**Always check the throttle for free movement, and rev limiter before operating.**
**Any mud motor equipped with this carburetor kit must have a working safety kill switch.**
**If you do not feel comfortable installing this equipment, have a certified professional install the product.**

**Tips:**
We recommend you spray WD-40 or other silicone on the prefilter a couple times each season. This helps prevent water from entering the carburetor.
We recommend you replace your fuel filter.
We recommend you use Autolite AP3923 or APP3923 spark plugs.
We recommend you use synthetic oil.
We recommend you use 91 or higher octane fuel.
We recommend you check your rev limiter often.
We recommend you use our tuned stainless exhaust and our Tiger Big Blade for best performance.
We recommend you let others know your destination and return time.
We recommend you carry a cell phone.

Thank you. Backwater Performance Systems, 7945 South, 1530 West, West Jordan, Utah 84088 801.352.8011, wwwbackwaterperformancesystems.com.